AMS

NR6 2016-2017

Amsterdam in business

The knowledge issue

Amsterdam's booming start-up scene

High-tech growth and new research

CONNECTING PEOPLE & TECHNOLOGY
2016
2017
European Capital of Innovation

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AMS NR 6 – The knowledge issue

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‘I’m an ambitious mayor of an ambitious city’

Amsterdam will be 750 years old in 2025. We want to celebrate this special anniversary in a dynamic and rounded city, where welfare and prosperity are balanced. A city that is an example to the rest of the world of how urban issues can be tackled and solved. In short, by 2025 we want to be one of the top three most innovative and viable metropolitan regions in Europe.

That is why Amsterdam has set high standards for itself and its partners. We have identified five areas in which we want to excel – areas in which the Amsterdam Metropolitan Area has what it takes to meet its ambitious goals by its big anniversary year.

The first one is health: it is our goal that, due to a healthier environment, our citizens will, on average, live two years longer in 2025 than they do now. Part of that will be achieved by implementing new measures in the realm of mobility, so that all urban traffic will be emission-free by 2025. Connectivity is our next area of focus, with the goal of making the Amsterdam Metropolitan Area *the* place to be in Europe for digital innovation. Connected to this goal is our ambition to be the most adaptive and attractive environment for job opportunities in Europe. And finally, all these goals have to be achieved in a smart and sustainable way: the Amsterdam Metropolitan Area will play an exemplary role in finding smart solutions for closing the loops and for shortages in raw materials.

The Amsterdam Metropolitan Area has the innovative strength to quickly act upon the changes taking place all around us. The European Commission agrees: in April it named us the 2016 European Capital of Innovation. There are many companies here that actively develop innovative products and solutions, in particular for current and future issues that urban areas around the world struggle with. We aim to provide an optimal climate for start-ups. Fundamental scientific knowledge is easy to access, and our scientists are becoming more entrepreneurial. The vital ICT infrastructure is widespread and stable, and the open and creative culture (an icon of Amsterdam) invites innovation by encouraging other ways of thinking and acting. As a local government, we see it as our task to eliminate as many administrative barriers as possible and to promote the trilateral relationship between industry, universities and government.

This edition of AMS is a testament to our ambitions, featuring a chapter dedicated to how innovations will bring Amsterdam closer to our goals. I hope you enjoy reading it and that it inspires you. And I invite you to follow us on our journey to 2025 – or better yet, to help us achieve our ambitions for this wonderful and dynamic city.

Mr. E.E. van der Laan
Mayor of Amsterdam

On the cover: NEMO
In its striking, copper-green building designed by architect Renzo Piano, towering over Amsterdam’s Eastern Docklands, the NEMO Science Museum receives almost 600,000 visitors per year, making it the fifth-largest museum in the Netherlands. NEMO’s mission is to bring science and technology closer to the public in an interactive and accessible way, in the museum, at schools, online and at nationwide events such as the Weekend of Science technology festival. Working closely with the scientific world, through advisory councils, joint research initiatives and meetings between scientists and the general public, NEMO champions the interests of science by ensuring public support and increasing the pool of future talent by inspiring children.

Photo by Renzo Gerritsen

Read AMS online at www.iamsterdam.com/ams

NEW IN AMS

text Douglas Heingartner

Inspiring new businesses, initiatives and organisations. In this issue: Europe's Capital of Innovation, collaborating with Google and TNW's new tech hub

photo: Peter Hilz/Hollandse Hoogte

Oracle opens new Amsterdam office

Space for 400 more employees

American tech giant Oracle has a new office in Amsterdam, which will create approximately 400 new jobs. The Oracle Corporation, which has 135,000 employees worldwide and an annual revenue of around US$38 billion, has chosen Amsterdam as one of its six European sales centres for cloud services. In addition to its excellent IT infrastructure, another factor that helped the company settle on Amsterdam is the city's highly educated, talented and multilingual workforce. Amsterdam is committed to becoming one of the top three start-up hubs in Europe, and attracting such names as Oracle will help enhance Amsterdam's growing tech scene.

www.oracle.com

China Construction Bank opens Amsterdam branch

The Dutch capital now hosts two major Chinese banks

As part of its broader expansion into Europe, China Construction Bank (CCB) has opened a new office in Amsterdam, the official opening of which took place on 30 June in the presence of many VIPs. Established in 1954 and headquartered in Beijing, CCB is one of China's – and the world's – largest banks, with a market capitalisation of more than US$207 billion. It is the second major Chinese bank to come to the Dutch capital, following the Industrial and Commercial Bank of China (ICBC), which opened an Amsterdam office in 2011 as part of an ambitious strategy to increase its presence in mainland Europe.

www.ccb.com
www.investinholland.com/china-construction-bank-opens-branch-in-amsterdam

Europe's 2016-2017 Capital of Innovation

The European Commission's €950,000 investment

Amsterdam has become Europe's Capital of Innovation. The city earned the 'iCapital' title, which comes with a €950,000 investment in the city's continuing innovation, for its 'holistic vision of innovation' in four areas of urban life: governance, economics, social inclusion and quality of life. The Dutch capital city beat out a short list of nine nominees that included Berlin, Glasgow and Oxford, chosen by an independent panel of experts from 36 applicants. Amsterdam's new title was announced at an award ceremony given by the European Commission 8 April 2016. (Turin and Paris were awarded second- and third-place prizes, respectively.)

ec.europa.eu/research/innovation-union/index_en.cfm?section=icapital

Google's collaboration with Amsterdam

Helping urban mobility

Google and the City of Amsterdam have entered into a collaboration that focuses mainly on improving urban mobility. The alliance is a considerable step forward in the city's goal to become a truly data-driven urban centre. Amsterdam was one of several cities approached by Google regarding a number of joint data initiatives and, in Amsterdam's case, Google will be providing data about the flow of traffic in the western part of the city. This data will then be used by the AMS Institute in a series of test projects.

www.amsterdamsmartcity.com/news/detail/id/790/slug/traffic-data-is-used-to-improve-urban-mobility

photo: CSMART

Carnival Corporation invests further in Almere

The world's leading cruise company expands its presence

The Miami-based Carnival Corporation, the world's leading cruise company, is going to invest US$78 million in a new training facility and hotel on its campus in the city of Almere. The centrepiece will be the expanded Center for Simulator Maritime Training (CSMART), a state-of-the-art maritime training facility that originally opened in 2009, already the largest of its kind in the world, which Carnival Corporation uses for maritime training, research and professional development. Carnival Corporation says that Almere's proximity to Schiphol Airport and its business-friendly climate were important factors behind their choice of location. The expanded facility is due to open by the summer of 2016.

www.csmartalmere.com

photo: Patrick Post/Hollandse Hoogte

Advise Technologies continues European expansion

Cementing Amsterdam's role as a growing FinTech hub

Advise Technologies, a provider of compliance software for investment managers, plans to hire approximately 40 extra staff in Amsterdam by the end of 2016. The New York-based tech firm, which opened its European headquarters in Amsterdam in March 2015 and currently has a staff of 10 employees here, recently moved into a new office in the city to accommodate the planned expansion. From its location in Amsterdam, Advise Technologies is able connect with the financial sector in continental Europe, building products for Europe in Europe.

www.advisetechnologies.com

NEW IN AMS

SoftLayer opens data centre in Almere

New cloud centre for IBM-owned company

SoftLayer has announced the opening of a second data centre in Almere. The addition doubles SoftLayer's capacity in the Netherlands, which is necessary in order to meet the tremendous growth in demand for cloud services. The company also plans to grow rapidly in the Amsterdam area in the near future, and IBM Cloud aims to triple SoftLayer's technical and commercial staff in the region.

www.softlayer.com

Hotel Jansen: not for tourists

A home from home

Hotel Jansen is a new short-stay hotel in Amsterdam offering attractive and affordable accommodation for young talent from all around the world. Hotel Jansen is a place you can call home, be it for a day, a week or six months. Each room and floor is unique, with hand-crafted furniture and art created by a collective of Dutch artists and carpenters. Not only is Hotel Jansen a great place to stay, it's also a convenient way to get your bearings in Amsterdam and to get to know a varied international crowd.

www.hoteljansen.nl

photo: Rachel Schraven

Raft Collective sets up shop in Amsterdam

Creating thoughtful connections in the capital

Raft is a new UX (user experience) design consultancy that has chosen Amsterdam as its base. The firm crafts thoughtful connections between users and their products, and its focus is on the quality of design, strong client relationships and assisting in making products real. Although the agency is new, its founders have long worked in various business sectors, such as e-commerce, telecommunication, banking, travel and health care.

www.raftcollective.com

Cargill's IGMA comes to Port of Amsterdam

Expanding agribulk storage

Renovations are underway for a new tenant, IGMA, at the Port of Amsterdam. The company, a subsidiary of Cargill, will use the site for the storage and transshipment of agricultural products such as soy, grains and maize. The new terminal is set to begin operations after the summer. The port's strategic location in Europe ensures excellent connections to all major European markets.

www.igma.nl

Daum Games Europe opens in Amstelveen

The MMO game publisher has chosen the Dutch capital area as its base in Europe

The global publishing arm of Daum Games Co. Ltd., a subsidiary of the Korean Kakao Group, was established to bring the MMORPG (massively multiplayer online role-playing game) Black Desert Online, developed by Pearl Abyss, to Western gamers. Daum Games Europe has chosen the Amsterdam Metropolitan Area, with its central location, connection to large gaming markets, international talent pool and high-volume data centres, as the base of its Western operations. With the support of the Dutch embassy in Seoul and amsterdam inbusiness, they opened their office in Amstelveen in June 2015. The office currently employs about 20 people, but with 400,000 subscribers and €12 million in income already, expansion is expected over 2016 and beyond.

www.linkedin.com/company/daum-games-europe-b-v-

Leader Biomedical headquarters in Amsterdam

Hong Kong biotech firm chooses Amsterdam

The deep ties between Amsterdam and China grew even stronger with the establishment of Leader Biomedical's European headquarters in Amsterdam. The Hong Kong-based life-sciences company's mission is to bring its portfolio of biomaterials and implants to high-growth markets. Its team at the WTC in Amsterdam will be in charge of business development, legal & regulatory affairs, marketing & sales and human resources. The company acquired the Nijmegen-based biomaterials manufacturer EMCM in 2014.

www.leaderbiomedical.com

photo: Peter Hilz/Hollandse Hoogte

The Things Network makes Amsterdam smart

Wirelessly connecting boats, bikes and more

A new Internet of Things project is launching in Amsterdam. The Things Network will cover the entire city with a wireless signal that connects everything from trash cans to street lights. A pilot project involves fitting boats with small internet-enabled devices that will send a text message if they detect a leak. The initiative, which was entirely crowdsourced, was pulled together in only six weeks. The Things Network also has potential for bike-location systems and security installations, and the Port of Amsterdam has already expressed interest.

www.thethingsnetwork.org

NEW IN AMS

FinTech start-up Bunq launches in Amsterdam

A new kind of bank

Amsterdam-based Bunq wants to become the WhatsApp of financial services. Their app lets users easily make payments and withdraw money from ATMs. Bunq's formal banking license from DNB, the central bank of the Netherlands, means that its customers have IBAN bank accounts and can make payments to other banks. Bunq is the first new independent bank to receive an official banking license in the Netherlands in ten years.

www.bunq.com

Amsterdam to get new tech hub

TQ will host startups

Google and The Next Web are launching a new tech hub in Amsterdam that will house 120 new companies. This 'curated community' of tech start-ups, known as TQ, will open in the spring of 2016. Their building in the centre of Amsterdam will include offices, collaborative spaces, innovation labs, dining facilities and an event area. The top floor, with sweeping views across the city, will be open to the public. Other involved corporate partners include Booking.com, ABN AMRO and KPMG.

www.tqams.com

photo: TQ

Mitsubushi's Life Sciences division in Amstelveen

The food-development lab's new EU HQ

Mitsubishi Corporation Life Sciences Limited recently established its European headquarters on Amstelveen's Stroombaan. MCLS Europe chose to be in the same building as Nestlé, one of its most important clients. The division, which currently has five employees, is planning to grow quickly, and its Amstelveen office offers room for expansion.
The company develops and manufactures specialty food ingredients such as sweeteners.

www.mclsltd.com/english/index.html

Russell Shorto

The DNA of A'dam

Russell Shorto (1959) is an American author, historian and journalist, best known for his book on the Dutch origins of New York City, *The Island at the Center of the World.* He is a contributing writer for the *New York Times Magazine* and is the former director of The John Adams Institute in Amsterdam, where he lived between 2007 and 2014. In 2009, Russell received a Dutch knighthood in the Order of Orange-Nassau. His most recent book, *Amsterdam: A History of the World's Most Liberal City*, was published by Doubleday in October 2013.
photo: Robin de Puy

Amsterdam and the history of science

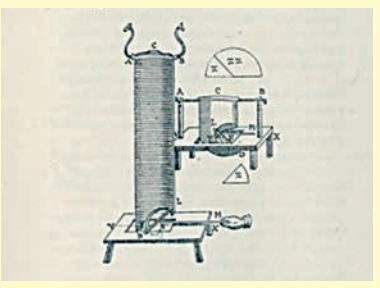
Rene Descartes, the so-called father of modern philosophy, arrived in Amsterdam in 1628. As a thinker and writer whose ideas at times crossed both the Catholic Church and the French King, he was attracted by the city's famous freedom of expression. And he wasn't disappointed. "In what other country could you find such complete freedom?" he wrote to a friend after he had taken up residence.

Today Descartes is thought of as an abstract thinker, but in his lifetime he was restlessly active in applying his ideas to the real world. His interest in the workings of the human eye resulted not only in a philosophical treatise on optics but a desire to transform the way people saw the world. And he quickly found that the city of Amsterdam inspired him in achieving his dreams. Shortly after arriving, Descartes wrote a long letter to a French tool maker outlining, in page after page of text and diagrams, a device he wanted the man to create that he believed would change the world and make both of them rich. It was a machine for manufacturing telescopic lenses. The machine would turn out lenses far faster than a human could, and with greater precision. He even drew pictures of what the device would look like.

In fact, Amsterdam was already well on its way to becoming the scientific capital of Europe. The Dutch not only had the most open and tolerant of societies, they were also, in the course of the seventeenth century, the continent's businessmen *par excellence* – and when it came to the development of science, those two things worked hand in hand to make Amsterdam a unique place. The city's open culture brought thinkers like Descartes. It also gave rise to the most prolific publishing climate in Europe. As an industry, publishing is unique in that its end products are *ideas*, which naturally spawn more ideas. The twin occurrences – that the city became a hub for scientists, and that it became the centre of publishing – fed one another, resulting in the astounding fact that, over the course of the 17th century, approximately one-third of all books published in the entire world were produced in Amsterdam.

Within the field of publishing, the city became the centre of a sub-specialty: cartography. The hunger to know the scope of the planet was at its height in that era. Producing new, accurate maps of distant regions required hundreds of bits of information. The offices of Amsterdam's cartographers (such as the famous Blaeu family) became the Big Data hubs of the era. Merchants who did business in the East Indies, ship's captains and trained hydrographers sent their measurements of coastlines, tides, currents, etc. All of the data was compiled and analysed in the cartographic offices, resulting in meticulously rendered maps of places as farflung as Java, Mexico and Morocco. Like nearly all of the city's scientific activity in its Golden Age, the cartographic work had immensely practical applications. It was used by commercial enterprises, notably the Dutch East India Company, to explore, exploit and trade.

The presence of scientific thinkers and the proliferation of scientific treatises from the city's presses, combined with the legendary Dutch business acumen, meant that Amsterdam also became the centre of scientific industry in other arenas. Fabricators in Amsterdam turned out lenses, microscopes, telescopes, dissecting tools and other equipment that the burgeoning arena of science required. Natural philosophers – as scientists were then termed – placed orders from all over Europe, or visited the city in person to have equipment made to their precise specifications. Descartes' dream became reality in ways far beyond even the French genius's ability to imagine.



Descartes' machine

Impactmakers

‘A place where idealism meets expertise’

Amsterdam has a rich history of social entrepreneur-ship. Platforms such as Social Enterprise NL and the Impact Hub build upon existing expertise to help social enterprises get started or grow their business

text Catalina Iorga
photography Amke

SUSTAINABLE ECONOMY

'Doing good business and improving society is in Amsterdam's DNA. It is not afraid of celebrating a fringe perspective' (Tatiana Glad, Co-founder and Director of Impact Hub Amsterdam)

When it comes to the latest developments in sustainable business, adopting universally accepted definitions is no easy feat. That is one thing that came out of a recent debate, hosted by Amsterdam urban innovation platform Pakhuis De Zwijger, on what makes a 'circular economy', well, circular. But social enterprises – and the organisations that help them grow – stand in agreement: positive societal impact comes first, ahead of owner or shareholder profits.

As the city with the most social enterprises in the Netherlands, Amsterdam has a rich history of businesses focused on a more inclusive labour market and on solving other societal challenges. In 2015, research revealed that 62 local social enterprises were employing 2,800 people with occupational disabilities.

One of the ways Amsterdam's local government is showing strong support for this movement is by ensuring that social businesses get shelf space and higher sales to increase their impact. This is one of 17 concrete measures on the agenda of the Amsterdam Economic Affairs' Social Entrepreneurship Plan 2015-2018, through which strives to turn the city into *the* place to be for impact-driven entrepreneurs.

What's more, Social Enterprise NL, the Dutch national platform for social entrepreneurs, boasts nearly 300 member companies operating both locally and internationally in 16 sectors and impact areas, such as inclusive employment, social cohesion, poverty reduction and environmental sustainability. The Amsterdam Impact Hub was the first of its kind in the Netherlands, and subsequently the co-creator of a growing global community of over 12,500 social entrepreneurs in 82 – and counting – cities worldwide.

WHY NOW, WHY AMSTERDAM

'What is most valuable about social enterprises is that they dynamically blend social responsibility with business opportunities. Any enterprise should be creating value for society,' believes Tatiana Glad, Co-founder and Director of Impact Hub Amsterdam.

Since the first such Hub, of which Glad was a member, launched in London in 2005, the global Impact Hub network has grown into a mature entrepreneurial ecosystem that acts as an incubator and accelerator for innovative start-ups keen on tackling economic, environmental and societal challenges.

Dutch-Croatian Glad was brought up in Canada, where her family immigrated to when she was seven years old and started a small sustainable bakery. 'Looking back, my drive for co-creating the kind of society I want to live in came from seeing my parents contribute to our local community,' she adds. With a background that spans the financial, non-profit and government sectors – she worked as the Global Quality Manager of Citigroup; co-founded Waterlution, a Canadian NGO advocating sustainable water management and collaborated with the European Commission – Glad came to Amsterdam in 2006 to explore her Dutch heritage.

'Before coming here, I saw the Dutch as progressive and well-versed in environmental, social and governmental change. I expected to find a place where you can have an intellectual conversation rooted in decades of experimentation, but also pragmatism. And that's exactly what I did find,' Glad explains.

'In fact, the Impact Hub in Amsterdam started as an 18-month conversation between volunteers who cared about the city's problems, be they related to water or integration. We wanted to shape a cross-disciplinary, physical space for experimentation where unlikely allies, such as corporates and activists, can meet,' she adds.

In 2013, this desire reached its peak, resulting in the Impact Hub's second multifunctional co-working, event and networking space in the Westergasfabriek area, home to many of Amsterdam's innovative entrepreneurs. Designed specifically for interaction, collaboration and learning by one of its members, AKKA Architects, Impact Hub Amsterdam is located in the Westerpark district's former municipal office.

'We legitimised and professionalised idealism through entrepreneurship,' Glad says proudly. Her words are echoed by achievements such as the €3 million invested in several of the 10 social enterprises that took part in the 2014 edition of the Impact Hub's Investment Ready programme. This annual four-month peer-learning programme sees carefully selected participants engage in a systematic review of their business model before crafting a growth and investment plan that they pitch to the growing number of impact investors in Amsterdam.

Among the programme's successful alumni is the Edie Award for Sustainable Business Models-winning MUD Jeans, a social enterprise that makes denim from mostly recycled or organic cotton and uses at least 75% less water per pair than the industry average.
In less than eight years, Impact Hub Amsterdam has thus grown from a value-driven group of volunteers to a professional team that is running a social enterprise.
The Impact Hub puts its money where its mouth is and practices sustainable procurement that generates roughly €300,000 worth of yearly business for several Dutch socially responsible firms, including Tony's Chocolonely, a confectioner that strives to abolish slavery in the chocolate industry.
'The local community really embraced us,' concludes Glad. 'Doing good business and improving society is in Amsterdam's DNA. And in times when cities are being pushed to close off their walls, Amsterdam is not afraid of celebrating a fringe perspective.'

A NATIONAL PLATFORM FOR GLOBAL IMPACT

Serving as another testament to the Dutch spirit of innovation, the Higher Education Act of 1876 laid the foundations of the modern research university. 1876 also happens to be the year when a building was erected on the city's Keizersgracht canal that would go on to host the former groundbreaking Netherlands Media Art Institute and, since 2012, the Dutch national platform for supporting social entrepreneurs, Social Enterprise NL.
Social Enterprise NL seeks to build a national ecosystem in which entrepreneurs can thrive through business-support programmes focused on areas such as market positioning, regulatory frameworks and financing.
'We don't decide what our network does; we facilitate collaboration and learning exchanges between like-minded entrepreneurs instead,' says Willemijn Verloop who, together with Mark Hillen, is Co-founder and Director of Social Enterprise NL.
'My personal mission is bettering the world. I was very proud of the achievements of War Child, the organisation I founded when I was 24, but had become increasingly frustrated with the pace of societal change,' she explains. 'Although NGOs do great work, they often depend on unstable philanthropic financial streams.'
Verloop felt that most problems in the non-profit realm stemmed from the absence of structured financing, and set out to implement a new model for effecting societal change. 'I decided to build something rooted in the same idealism, but using a different tool: the business sense of the gutsy entrepreneur who is capable of scaling innovative solutions to take on society's biggest challenges,' adds Verloop.

Tony's Chocolonely
In 2015, Tony's Chocolonely celebrated a decade of its journey towards achieving a 100% slavery-free chocolate industry. The idea first emerged in 2002, when Dutch broadcast journalist Teun (or 'Tony') van de Keuken uncovered the harsh reality of child slavery on many West African cocoa plantations.
Faced with the reluctance of major chocolate producers to act on this issue (hence, the 'lonely' part of the brand's name), van de Keuken decided to start a socially minded business that aims to source fair-trade – and, if possible, organic – cocoa from fully transparent and responsible farmers.
Now led by Chief Chocolate Officer Henk Jan Beltman, who cut his teeth in the food sector as the Benelux Country Manager of Innocent Drinks, the company introduced its Bean-to-Bar programme in 2013 and established long-term relationships with two FAIRTRADE-certified cocoa cooperatives in Ghana and Ivory Coast, which now provide roughly half of the beans Tony's Chocolonely needs.
But it's not only through its operating model that this enterprise contributes to a slave-free cocoa supply chain. The Chocolonely Foundation receives 1% of the company's net turnover for activities such as building a new shelter for former child slaves in Burkina Faso and research to better the cocoa industry.

Ctaste

Dining in complete darkness is a relatively new culinary development. The first such restaurant, Blindekuh ('Blind Man's Bluff') opened in Zurich in 1999, and the concept soon made its way to Amsterdam. Partially inspired by a Parisian dinner in the dark, Sandra Ballij and Bas de Ruiter left their bank jobs in 2007 to start one of the first commercially successful social enterprises in the Netherlands.

The Ctaste restaurant helps to tackle the staggering 70% rate of unemployment for people with sensory disabilities by recognising the unique abilities of blind or visually impaired staff. Using skills such as excellent attention to detail and spatial awareness, partially sighted waiters guide guests to their tables in a pitch-black room and answer any questions that arise as patrons try to decipher the flavour combinations of their surprise meals.

Emboldened by the restaurant's success – it attracts nearly 20,000 visitors a year – Ballij and de Ruiter started CtheCity and Ctalents. The former is a multisensory tour of Amsterdam in the dark, which is given by blind guides and held in a 300m2 room that simulates scenes of the city. The latter is a diversity-management agency, which trains sensory-talented young professionals and matches them to inclusive employers.

TTC Mobile

This unique service-oriented social enterprise dates back to 2007, when, inspired by a documentary on the massive growth of mobile phones in Africa, Amsterdam-based entrepreneur Hajo van Beijma and marketing expert Bas Hoefman decided to harness this growth by using mobile technology to connect organisations to previously hard-to-reach audiences.

Since then, TTC Mobile has worked with everyone from international organisations such as the United Nations to governmental authorities like the US Department of Foreign Affairs and big NGOs, including the Gates Foundation.

The company's mission is to reach as many people as possible in developing countries with free text-message info that enables positive behavioural change in areas of their lives such as health, finance, agriculture and education.

TTC Mobile's most recent effort, the PRIORRI Financial Literacy Training project, launched in February 2016 in cooperation with the World Bank and the Ministry of Agriculture of Mozambique, will see the company helping farmers save money through its interactive SMS platform Vusion that, every two months, sends farmers text messages summarising the amount of money saved up to that point.

Once again, she found in Amsterdam – just as she had when she started War Child in 1994 – a perfect breeding ground for ideas that aren't yet mainstream. 'This city has a liberal, creative spirit that gives social entrepreneurs much needed community support and space for experimentation.'

It didn't take Verloop and Hillen, a former Managing Partner of Accenture and an expert in crowdfunding, long to build a base for Social Enterprise NL, thanks to a large number of socially minded businesses already operating in the city. 'I discovered that Amsterdam has a history of entrepreneurship and private initiative focused on people's talents instead of their perceived disabilities,' Verloop explains.

Among Social Enterprise NL's members are many early examples of enterprises that operate as inclusive employers. Ctaste, a 'dine in the dark' restaurant founded in 2007, prides itself on hiring blind or partially sighted waiters, who are able to guide guests through meals in a pitch-black room. And Swink, a web-services company created in 2008, offers people with conditions such as Asperger's the chance to use their unique analytical skills to help clients improve their website's SEO or social-media presence.

Verloop also found in Amsterdam an existing fertile network of organisations, ranging from the aforementioned Impact Hub Amsterdam and Pakhuis de Zwijger to traditionally commercial accelerators such as Startupbootcamp and Rockstart, which are becoming more active in the social space.

'When impact is your drive and you have to swim upstream, it helps to have stubborn, like-minded people around. In our building alone, you can find shareNL, a knowledge and networking platform for the collaborative economy, and THNK, an academy for creative leadership with a strong social-innovation focus,' she adds.

CONNECTING THE DOTS WITH SOCIAL INNOVATION

Hajo van Beijma, Co-founder and Director of TTC Mobile, is no stranger to the collaborative power of Amsterdam's many co-working spaces, which he believes play a huge role in scaling up existing enterprises.

'When TTC Mobile started out in 2007 as a non-profit called Text to Change, we decided to share an office with two like-minded organisations,' says van Beijma, referring to the 1% Club, a crowdfunding platform that connects people in developing countries with smart ideas to those who can help them effect change, and Akvo, which builds open-source software used to make cooperation in international development more effective and transparent. 'At that time, we didn't call ourselves "social enterprises" yet, but we were among the first organisations in the city working on using technology in emerging markets to do good.'

clockwise from top:
Tatiana Glad, Impact Hub Amsterdam (photo: Dieter Schalk);
Willemijn Verloop, Social Enterprise NL;
Hajo van Beijma, TTC Mobile

Swink

Paul Malschaert, who has a background in IT and business development, was inspired by the vision of strong community relationships illustrated by sociologist Jeremy Rifkin in one of his books, *The European Dream*. In 2008, Malschaert decided to start up Swink, a social enterprise centred on the same inclusive ideal.

Co-owned since 2014 by former ING Marketing Manager Niels van Buren, Swink (Old English for 'strenuous labour') gives people usually excluded from the job market an outlet for their ambitions and abilities. This small company helps medium-sized organisations in areas such as healthcare and government to boost their online presence.

Most of Swink's employees have a form of autism, such as Asperger's, and have found in the company a supportive environment where they can use their often above-average intelligence and analytical skills for assignments like website SEO, social-media management and helpdesk outsourcing. With places such as the medical centre of the VU (one of Amsterdam's two research universities) on its roster of happy clients, Swink also prides itself on having recently acquired a B Corporation certification from B Lab, thus joining the ranks of more than 1,380 businesses around the world that meet strict social-sustainability and environmental-performance standards.

Marie-Stella-Maris

This Amsterdam-based social enterprise was set up in 2011 by Patrick Munsters, former creative director of Dutch denim makers Scotch & Soda, and Carel Neuberg, a former ICT executive, soon after a UN resolution adopted in July 2010 recognised the human right to water and sanitation.

Marie-Stella-Maris makes paraben-free natural cosmetics and also distributes mineral water sourced locally, from the Dutch town of Hoensbroek – less than 200km away from Amsterdam – and the St. Nikolaus spring in the Rhine region. The company's mission is, in Neuberg's own words, 'to provide clean drinking water to as many people as possible'. For each purchase, Marie-Stella-Maris donates a fixed amount to its eponymous foundation in support of clean-drinking-water projects. The foundation has already spearheaded eight such initiatives, ensuring that 17,000 people in Bangladesh, Mozambique, Tanzania and Uganda now have access to safe drinking water.

A *pur sang* entrepreneur who's never worked for someone else, Van Beijma was running his own ICT company when he met his future business partner and close friend Bas Hoefman, who came from a background of corporate marketing for financial institutions such as ING. Together they developed the idea of using SMS communication for health-awareness purposes after watching a BBC documentary on the explosive growth of mobile phones in Africa.

'TTC Mobile's mission is to reach as many people as possible in developing countries with the right information that enables behavioural change in areas of their lives such as health, finance, agriculture and education,' van Beijma explains. 'But we don't like to invent new software or hardware. Our strength lies in harvesting already existing knowledge.'

And nowhere is this ethos better exemplified than in the Healthy Pregnancy, Healthy Baby SMS Service of the mHealth Tanzania Partnership, in which TTC Mobile is the key technical associate. This service, which was nominated for the Best Mobile Innovation for Emerging Markets at the 2016 Global Mobile Awards, was set up in 2012 to help reduce child mortality by sending free text messages with tailor-made healthcare info to a wide audience that includes pregnant women, mothers with newborns and male supporters.

'We are good at connecting the dots. To create the Healthy Pregnancy, Healthy Baby SMS Service, we linked basic SMS technology with the end user's needs and the extensive content on maternal health in areas such as nutrition according to pregnancy stage provided by the Tanzanian Ministry of Health could provide,' van Beijma says. The service was a hit: by February 2016, it had amassed 1.2 million registered users, who had received 74 million free text messages, while 3,330 healthcare professionals had been trained to use the tool.

To keep spearheading impactful projects, TTC Mobile needs to examine its work's outcomes, which is why the company collaborates with prestigious higher education institutions such as the city's Vrije Universiteit ('Free University'). 'Scientific research helps us to truly understand what value TTC Mobile adds to the world,' Van Beijma points out.

With universities also starting to include social-innovation modules in their curricula, and Amsterdam attracting more investors that see capital as a tool for change – Verloop herself co-founded Social Impact Ventures NL, a hands-on social-enterprise growth fund whose portfolio includes Taxi Electric, the city's first taxi service with a fully electric fleet, which also trains unemployed locals to become drivers – the future of social enterprises in Amsterdam is looking very bright indeed. <

‘Royal circular ambitions’

The Netherlands is a global leader in closed-loop recycling projects, says Prince Carlos of Bourbon-Parma. ‘Our strength is in our holistic chain approach and ability to make workable agreements with all of the links’

text Hans Kops

photo: Gregor Servais

'It has always amazed me how irresponsibly and inefficiently we treat everything the earth has spent millions of years creating. You wouldn't wash your windows with a 50-year-old whisky…'

As far as HRH Prince Carlos Xavier Bernardo of Bourbon-Parma is concerned, the Amsterdam Metropolitan Area has made great progress in closing loops. As an example, the Prince gestures towards our surroundings with a wide sweep of his arm. This is Park 20/20, Europe's first business park designed entirely according to the 'Cradle to Cradle' principles developed by German chemist Michael Braungart and American architect William McDonough. The buildings are powered by clean and renewable energy sources; only recyclable materials were used in the construction; biological nutrients are returned to nature; harvested rainwater supplies the buildings; and waste is the beginning of a new loop. Even the asphalt on the approach road to this part of the Haarlemmermeer, located just minutes from Schiphol Airport, is made from recycled materials.

'But the innovation goes further,' says the prince. 'The project developer will continue to own the buildings and infrastructure, so it is in his interest to safeguard the continuity of the project by choosing quality over price.

The tenants also have a vested interest in maintaining and nurturing the ecological chain they work in, as this will allow maximum involvement and enable them to embrace innovation faster. People living in Amsterdam have a higher awareness of the value of their environment, and they adapt their behaviour accordingly. They eat more healthily on average and sick leave is low. The companies at Park 20/20 – such as Bluewater Energy Services, FIFPro (the worldwide representative organisation for all professional footballers), and the audio solutions company Plantronics – have also noticed that their environment makes it easier to attract talented people. Younger generations in particular find sustainability important. For them, being part of this is a statement.

'This is not an isolated project. It is a shop window for the circular ambitions of the entire region and beyond,' continues Prince Carlos. 'I see similar projects developing all over the Netherlands. Despite having some catching up to do when it comes to energy transition, we are global leaders in closed-loop recycling projects. And we are rapidly adopting circular thinking and practices.

'Everyone I speak to knows that we're in the middle of an evolution process towards a circular economy. There's a very interesting business case for practical solutions that will take us away from the old model of extracting materials from the ground, using them and then throwing them away. The strength of the Netherlands as a circular hotspot is in our holistic chain approach and ability to make workable agreements with all of the links.'

AN UNBALANCED MODEL

For the many Dutch royalty watchers, it's no surprise that Prince Carlos (as he is called by his business friends) has emerged as a frequently heard advocate of circular business. His mother, Princess Irene of the Netherlands (an aunt of King Willem-Alexander), is known for her keen interest in the natural environment. But the cosmopolitan Carlos stresses that his motivation is different and rooted in a deep conviction that there is something fundamentally wrong with the model we live in.

'The developed world consumes a disproportionately large share of the natural resources available to us, and as a result there isn't enough left for the rest of the world and for future generations. We have to use our lead in development to distribute wealth, welfare and security in a more balanced way. Circular thinking is not just about the preservation of our energy flows and living environment; it also means ironing out injustices and ensuring continuity for us all.'

He puts his mobile phone on the table in front of us.

'This device contains parts that have been made from rare earth elements mined in inhumane conditions in Africa.

But when a new model is released in two years' time, this one will go to the scrapyard. Basically, human lives are involved and I'm not acting responsibly. This really gets to me. I want products that don't make me feel guilty, that I can be sure weren't made using child labour, that haven't given rise to geopolitical conflicts and whose parts it is possible to reuse over and over again.
'This isn't merely an idealistic belief; it is also healthy economic thinking. Everyone wants to buy products that make them feel good. And it's just a matter of time before our fossil fuels are depleted or no longer accessible to everyone around the world. So we have to reduce our dependence on them, starting with a sustainable energy mix. It has always amazed me how irresponsibly and inefficiently we treat everything the earth has spent millions of years creating. You wouldn't wash your windows with a 50-year-old whisky…'

THE TIPPING POINT

That is why Prince Carlos and the staff of the Institute for Sustainable Innovation & Development (the network organisation he has set up) are championing a rapid transition to a circular economy. His major achievement was to pave the way for the SER Energy Agreement for Sustainable Growth – a 'polder agreement' between government authorities, companies, energy distributors and energy producers to realise two national environmental targets (reducing CO2 emissions to under the European standard and increasing the proportion of renewable sources in the energy mix) sooner. 'We spoke with at least 300 parties to start with and asked what they expected from a potential agreement,' explains Prince Carlos. 'This helped us understand their agendas, and them to understand each other's situations. My background and connections afforded me this easy access and enabled me to act as a neutral party. I don't have any political affiliations and can listen reasonably well. According to all of those involved, this approach worked well and helped them come to an agreement.
'Then I noticed we had passed the tipping point: we no longer needed to convince anyone about the importance of circular business in the context of CSR. All the directors of companies, government bodies, financial organisations and pension funds involved know it shouldn't just be a box-ticking exercise. It goes to the very core of their strategy.
'And we didn't just speak with the people responsible for the CSR (corporate social responsibility), we also spoke with CFOs and CEOs. They want us to help them find the most suitable business cases for their organisations, and they are earmarking additional budgets for this and putting their best people on the circular agenda. Basically, there are ambitious plans for growth in this area all across the Netherlands.'

'Knowledge of and experience in closed-loop recycling in all possible sectors has the potential to be the country's biggest export for perhaps the next 100 years'

Prince Carlos, in brief

HRH Prince Carlos Xavier Bernardo of Bourbon-Parma (born 1970) is the titular Duke of Parma and Piacenza, the cousin of King Willem-Alexander and a member of the Dutch Royal Family. He is the eldest son of Princess Irene of the Netherlands and the late Carlos Hugo, Duke of Bourbon-Parma, once a Carlist pretender to the Spanish throne. The young Carlos studied political sciences in the US and demography and philosophy at Cambridge University, England. As a banker, he helped introduce the Euro, following which he worked as a public affairs consultant in Brussels. Now he is the standard bearer of the Institute for Sustainable Innovation & Development, a network organisation that organises project-based initiatives like *Nederland Krijgt Nieuwe Energie* ('The Netherlands Gets New Energy'), and chairman of the Netherlands Circular Hotspot campaign. Prince Carlos is married to Annemarie Gualthérie van Weezel, with whom he has two daughters. The couple is expecting their third child, who will be born around the time of publication of this AMS edition.

'People living in Amsterdam have a higher awareness of the value of their environment, and they adapt their behaviour accordingly'

A LIVING LAB

His next 'point on the horizon' is to help make the Netherlands a circular hotspot – and the Amsterdam Metropolitan Area will play a key role in this. 'Knowledge of and experience in closed loop recycling in all possible sectors has the potential to be the country's biggest export for perhaps the next 100 years. We're building the knowledge, experience and skills in practical settings. We know a lot about water management (one of the future's scarcest commodities), we are world champions in agri-food, and we hold a strong position on clean and bio technology. We lead the way in climate control, we know how to organise logistics transport sustainably in an urban environment and, at Schiphol Airport, we are experimenting with organic additives in fuel. Dutch Design is famous across the world, and we have the knowledge on how to increase harvests and earnings by dividing seed. What's more, we live and work in a densely populated country. The lines between government authorities, the business world, NGOs, science and civil society are short. In that sense, the Netherlands is actually similar to Singapore, but with a larger back garden.'

Prince Carlos envisages Amsterdam taking on the role of living lab. Thanks partly to the Amsterdam Circular City programme, interesting pilot projects such as Park 20/20 and Buiksloterham are developing all over the city, underlining and enhancing the Metropolitan Area's attractiveness as a place of business.

Located on the north bank of the IJ river, Buiksloterham is an old industrial area that is currently being revitalised, which has designated as a Circular Living Lab. Among other things, the area will boast a smart grid – a two-way electricity network that enables residents and businesses to sell any surplus energy they generate back to the central grid. A local biorefinery is also being set up as a district heating facility, and all of the structures are being designed and constructed according to the 'Cradle to Cradle' principles. There is also a desire to eventually eliminate all waste flows, and experiments will be conducted with the wide-scale provision of car and bike share schemes.

The project's initiators – which include Amsterdam's municipality, project developers, financiers, scientists and tenants' associations – expect that Buiksloterham will become a model example of, and knowledge launching pad for, other cities with circular ambitions.

'Every large city has circular ambitions now, but Amsterdam has something extra,' says Prince Carlos. 'The chain here is well organised and the different links come together all over the place. This is something you have to stimulate. The government has to ensure that scientists with ideas come into contact with financial people, and that designers meet with production people. Innovation will then ensue, closing the loop a little further. But, like I said, Amsterdam is already doing well on all these fronts.' <

Amsterdam Circular City

In this programme, Amsterdam's municipal council communicates its desire to become the 'Circular Capital of Europe'. The point of departure is that, by adding value to the three Ps (people, planet and profit), the Amsterdam Metropolitan Area will be a place where life and work are brought together in a sustainable way. By closing as many loops as possible, new businesses and jobs are created, the energy supply can be guaranteed for the longer term and Amsterdam can present itself as a liveable, clean and partly self-sufficient city. The knowledge and skills acquired will eventually also form an increasingly important export product.

The circular city model therefore has a future, say the programme's authors. Amsterdam strives to learn by doing and, in that context, a large circular project has already been realised in the Metropolitan Area. On a European scale, experiences are being shared with other cities in the Adaptive Circular Cities programme. And the Amsterdam Institute for Advanced Metropolitan Solutions, a new initiative of 20 partners (mostly scientific institutes), and the Amsterdam Economic Board are focusing on the development of circular solutions in an urban setting.

clockwise from top: Buiksloterham (photo: Isabelle Nabuurs/Hollandse Hoogte), Buiksloterham (photo: Patrick Post/Hollandse Hoogte), Buiksloterham (photo: Berlinda van Dam/Hollandse Hoogte)

Celebrating diversity

In 2016, the city of Amsterdam celebrates its diversity by mapping all of the 180 nationalities that live within its boundaries, photographing and listening to the stories of representatives from each of these groups, from the 12,354 Brits to that one person from Djibouti. These portraits are shown throughout the year in local media to remind the Amsterdammers of the richness of their world. One thing that binds all Amsterdammers, native or imported, is that they feel free here. A feeling that, as Russel Shorto argues in this article, has been part of the city's DNA since the 17th century.

180 Amsterdammers **is an initiative of Amsterdam Marketing, AmsterdamFM, Bridgizz, Nieuwwij, Story Supply, the OBA (Amsterdam Public Library), the Amsterdam Museum, Het Parool and the City of Amsterdam. For more information, visit www.180amsterdammers.nl/en**
Photos: Michiel van Nieuwkerk

‘The benefits of openness’

With 180 nationalities, Amsterdam is scoring high marks on diversity. Russell Shorto – historian, former Amsterdammer, and author of two highly acclaimed books about Amsterdam – traces its origins. ‘Diversity is not the point; it’s your openness that counts’

text Russell Shorto
boxouts Sarah Gehrke

LIFE IN AMSTERDAM

'Diversity is a modern buzzword. The real world, the world of glass-and-metal skyscrapers and thronged sidewalks, is far ahead of "diversity"'

I never stopped to take note of the range of nationalities I was in regular contact with during the six years I lived in Amsterdam, but writing a column about diversity in the city offers a good excuse to reflect on the subject. French, Irish, Iranian, Moroccan, American, Canadian, South African, Australian, Israeli, Afghani and Belgian – that would be a quick accounting. Oh, and Dutch.

Of course, anyone living in any city might easily conjure a similarly varied list. That's the nature of the world we live in. One thing that sets Amsterdam's diversity apart, however, is its antiquity. Maybe it's stretching things to say that Amsterdam invented diversity, but it is certainly the case that Amsterdam's growth – its rise to Golden Age greatness – had precisely to do with its diversity. And it's not a stretch to say this: in becoming the melting pot of Europe in the 1500s and 1600s, the city set the template for modern urban life.

CORPORATE SPEAK

'Diversity', of course, is a modern buzzword. To me it is corporate speak. It signals that the speaker is about to go down the dull road of attempting to appease some perceived community of the aggrieved. The word has the hollow thud of insincerity in it. The reality behind it, however, is the opposite of dull and insincere. The real world, the world of glass-and-metal skyscrapers and thronged sidewalks, is a place where ethnicities, languages and cuisines simmer together and emit new products and ways of being with digital lightspeed. The real world is far ahead of 'diversity'.

Amsterdam, with its unique role in European history, set the foundation for our real world. Circa 1584, it was the destination for refugees. Spain had attacked the provinces of what is now Belgium; the city of Antwerp – which was the New York of the day, the hub of finance and cross-cultural business – fell to the armies of the Inquisition. People panicked. Bankers and textile manufacturers, cartographers and spice dealers, Jews and Christians – they all fled, northward. Amsterdam had been rising over the previous century, too, and was growing in a humbler, rougher way than Antwerp: not on the refined trade that Antwerp specialised in, with things like silk and cinnamon, but on bulky, earthy products: timber, salt, herring. Many Antwerpers had links to it, so it became their destination.

That mass migration proved to be the first step to Amsterdam's discovery of the secret of (dare I say it) diversity. You have to remember that throughout Europe (indeed, around the world) for most of history, 'intolerance' was official policy. It was universally held that in order for a society to be strong and stable, its people had to be unified. A mix of languages and faiths spelled disorder, which meant, in time, chaos, and eventual takeover. Nations worshipped the gospel of purity.

GALILEO AND DESCARTES

In the midst of an intolerant world, Amsterdam, as it took in hordes from all over Europe and from as far away as Africa and the Middle East, discovered that there was gold to be mined in the reverse concept. Tolerance of differences – not just on the part of the government, but in the eyes of ordinary citizens, neighbours, people on the street, too – meant connections to far-flung lands, business deals and access to new ideas. Those new ideas often meant new business, even new industries. And, in time, the reputation for tolerance had a multiplying effect. Amsterdam's printers – rough tradesmen with their ink-stained hands – capitalised on the city's reputation as an entrepôt for new

Corporate diversity

Diversity has been a longstanding trademark of the Amsterdam corporate world. As a trading nation, the Dutch ventured everywhere. Today the openness of Dutch society, the quality of living in Amsterdam and the international orientation of its corporations is reflected in its remarkably diverse workforces. Three examples: The world leader in navigation products, **TomTom** is headquartered in central Amsterdam for the precise reason of attracting the brightest engineers from all over the world. The company is home to over 30 nationalities and employs an additional 4,400 people across 40 countries worldwide. The company demonstrates its positive global citizenship by encouraging employees worldwide to volunteer with local charitable organisations.

The headquarters of **Booking.com**, market-leading online accommodation booking site, is based in the centre of Amsterdam and is home to 1,200 employees from over 70 countries. 'In theory, as an online hotel-reservation company, we are not bound to one location,' says CEO Darren Huston. 'But it's crucial for our type of business to attract talented people from all over the world. As such, Amsterdam is a great asset for us. Especially for young people, the work-life balance of this city is a unique experience.'

The **Royal Concertgebouw Orchestra** in Amsterdam has approximately 25 different nationalities amongst its performers – unsurprising considering the audition process. Positions are advertised worldwide and success relies solely on demonstrated ability. Since the orchestra's conductors also come from many different countries, the stage language used by the orchestra is English. 'We play music from all around the world every day, so we deal with diversity through our music,' says head of PR, Anne Christin Erbe.

top photo: Elmer van der Marel
bottom photo: Pepijn Hooimeijer

Amsterdam's Indian expat community

Once a year, the city of Amstelveen, at Amsterdam's southern end, plays host to a true spectacle. The Diwali Festival, the ancient Hindu festival of lights, has been celebrated here for seven years. In 2016, the festivities will take place on Saturday, 22 October, and are being organised by the City of Amstelveen, amsterdam inbusiness and various private parties. About 18,000 visitors are expected to join the celebrations.

Around 8,000 Indian expats live in the Amsterdam area, so it's not surprising that a Diwali Festival of such a scale exists. Many of these expats come as highly skilled migrants, working for Tata Consultancy Services, Tata Steel, Infosys, Sun Pharma or one of the many other large Indian companies that have established offices or factories in the region. All in all, there are 90 Indian companies in the Amsterdam area, and 180 in the Netherlands in total.

As a result, the Netherlands is home to the second-largest Indian community in mainland Europe, comprised of roughly 215,000 people. The highest number of highly skilled migrants to take advantage of Expatcenter Amsterdam's services are from India – in 2015 alone, 2,800 came from India to the Amsterdam Area – and there is much in the region to make the Indian community feel at home. For instance, there are eight international schools and various secondary schools that offer a bilingual education, the Amstelland Hospital provides a dedicated India Desk for health advice, and there are various dedicated non-profit organisations, such as the Netherlands India Chamber of Commerce & Trade and the Netherlands-India Association. On 31 May 2016, Indian-Dutch relations will be emphasised once more at the Netherlands India Business Meet, a countrywide congress for bilateral trade relations between the two countries.

Perhaps most importantly for some, 25 June will see the return of the annual India Cricket Day at the VRA Cricket Club in the city's forest, the Amsterdamse Bos, with 16 teams from Indian companies in the Amsterdam area competing. The day is concluded with a casual networking event hosted by the Indian Ambassador to the Netherlands, His Excellency J.S. Mukul. Both *bitterballen* and samosas will be served: a true meeting of cultures. May the best snack (and team) win.

ideas by announcing their availability to print texts on a wide variety of topics, virtually free of censorship. Soon the city became the world capital of publishing. Political and scientific tracts – both of which were banned in many other places for impugning ruling regimes and/or the Church – churned from the city's presses. Galileo and Descartes had their works published by Dutch printers. And those works contained not only new ideas, but also the seeds of new industries. You're an enterprising businessman and you read about the wondrous possibilities of the telescope or the microscope. What do you do? You open a factory that produces lenses, eyepieces, metal tubes, focusing knobs. The city's surgeons held public anatomy lessons by dissecting the corpses of executed murderers, causing a flurry of interest in the subject. The presses got to work producing exquisite full-colour texts showing the intricacies of the human body. A skipper from Norway or Iceland would pull into the IJ, Amsterdam's harbour, in a vessel sporting an innovative hull design, and the city's shipyards would get to work.

That is how Amsterdam became the centrepiece of the Golden Age, and, in time, the model that other cities strove to copy. 'Diversity' – in the sense of a target number of different nationalities – is not necessarily the point. Openness is the point. We know this today – at least, some of us do. We know that innovations in wind power, water management, elevator design, biodegradable packaging or sustainable farming come from dropping defences, from being a truly open society.

180 NATIONALITIES

With 180 nationalities, Amsterdam today reflects its past. You see the most obvious modern-day form of the city's storied openness in places like the Dappermarkt, in Amsterdam Oost, which is sometimes called the best open-air market in the Netherlands. There is a babble of languages. Buyers, sellers and products come from Suriname, Indonesia, China, Thailand and Poland.

Of course, such 'Balkanisation' (if I can use the term) may signal the opposite: a tendency on the part of ethnic communities to remain apart, a tendency not to mix and share ideas. And in Europe, lately, the fear of terrorism, of newcomers taking jobs or of the local culture drowning in a sea of foreignness has been strong. Nativism is on the rise. There are reasons for concern.

And yet, the engine of history is not going to move in reverse. The genie is out of the bottle; the world of our children will be unimaginably different from the one we grew up in. It could be darker and more frightening. Or it could be brighter, more filled with possibilities, more open and also more secure. To get there requires bravery.

Amsterdam today – the city I know and have lived in and written about – knows its history, knows what has worked so well. Even such a thing as the *Zwarte Piet* debate is enormously healthy. It reflects a more fully engaged mixing of cultures and backgrounds. Old stereotypes are being seen as just that: old and stereotypes. New traditions can be invented. Amsterdam's past is its future. <

Amsterdam's Moroccan community

The Amsterdam Metropolitan Area and Morocco have a long-shared history: Moroccan-born Amsterdammers and Amsterdammers of Moroccan descent make up more than 9% of the city's population. Almost half of them were born in the Netherlands; many others came to the country as part of a family reunification. Today, Moroccan businesses such as restaurants and specialty shops form an important part in many Amsterdam streetscapes. This is especially prevalent in areas such as Amsterdam West and Amsterdam Nieuw-West, the latter of which was described by the Dutch-Moroccan writer Abdelkader Benali in an interview with *Words without Borders* as: 'a suburb that has a kind of strange mix of urban normality (…) and this great pleasant lake [Sloterplas], where you feel like you're in the '50s. People who live there come from every corner of the world and give it the atmosphere of being in Istanbul or Tangier or Paramaribo. It's one of the most exciting places in town.'

Morocco and the Netherlands enjoy close business ties as well as social ones, with numerous Moroccan companies present in the Dutch capital. Also, the City of Amsterdam has a partnership with port city Larache, and Casablanca is a sister city. And in November 2015 the Mayor of Amsterdam, Eberhard van der Laan, headed a mission to Morocco, visiting Tangier and Casablanca. The Chaabi Bank, the Attijariwafa Bank and, most recently, OCP Group have all set up their international presence in Amsterdam. As the world's leading producer and exporter of phosphate in all forms, as well as a major player in the global fertiliser industry, OCP Group may act as a catalyst for many other businesses from the country, encouraging them to follow to the Amsterdam Metropolitan Area.

But it's not all about business: Amsterdam's Tropenmuseum Junior is currently showing an exhibition about life in Morocco, where visitors young and old can join four well-known Dutch-Moroccans on a trail through a medina and discover mosaics, calligraphy, fashion and culinary secrets.

With firm social, cultural and commercial ties, Amsterdam-Morocco relations are stronger than ever, and Amsterdam's Moroccan community, with their knowledge of the language and culture of both the Netherlands and Morocco, are in a unique position to build further bridges between the two countries.

Colleen Geske

Going Dutch

Colleen Geske is the blogger and best-selling author behind the brand *Stuff Dutch People Like*. Described as 'blunt, provacative and wickedly funny', her blog and books offer a satirical look at Dutch culture as seen through the eyes of an outsider. The *Stuff Dutch People Like* social community now numbers over 500,000 followers. Originally from Winnipeg, Canada, Geske has called Amsterdam home since 2004. When not writing, she is a communications and social media consultant.
www.stuffdutchpeoplelike.com
photography Pim Ras

Who's the boss: English by the Dutch

Holandes, Nederlands, Hollandsk, Néerlandais, Hollanti, Dutch – no matter what it's called, the Dutch language remains a mouthful. Broadly speaking, outside of the Netherlands and Belgium, the Dutch language is relatively unknown. (Thankfully, 90-93% of 'Nederlanders' feel comfortable conversing in English.) Of course, the Dutch language's characteristic guttural Gs can also be heard in Suriname and the Dutch Antilles (Aruba, Curaçao, Sint Maarten, etc.), but many a tourist has been utterly shocked to learn that the Dutch do indeed have their own language. And no, it isn't German! With just over 20 million worldwide speakers, Dutch barely sneaks into the top 50 most spoken languages in the world. It claims the second-to-last spot, #49, just before Kurdish. However, despite the low ranking, its global influence is impressive and reveals much about the Netherlands' prosperous past.

LINGUISTIC LANDSCAPE

On careful inspection of the English language, you will discover that thousands of words actually have their origins in Dutch. In fact, the first word in the English dictionary is 'aardvark', which is, of course, Dutch! In his book, *Origins of the English Language*, linguist Joseph M. Williams estimated that around 1% of English words are of Dutch origin. For a relatively tiny country this is no small feat.

Many of these Dutch loanwords (words adopted from another language and incorporated into a recipient language *without* translation) reveal fascinating insights into the nation's history. During the Dutch Golden Age (spanning most of the 17th century), Dutch trade, military and art were among the most acclaimed in the world. It therefore comes as no surprise that many Dutch terms relating to seafaring, commerce, industry and trade highlighting the Dutch proclivities of the 1600s pepper the modern English linguistic landscape.

NAUTICAL KNOWHOW

With the Dutch leading the seafaring nations of the 17th century, many English nautical words have their origins in the Lowlands. Examples include the English words **cruise**, **sloop**, **buoy**, **deck**, **dock**, **freight**, **keel**, **reef**, **tackle**, **pump**, **bow**, **skipper** and **yacht**, which all derive from nearly identical Dutch terms.

If your modern-day frustrations start and end with your *boss*, you can go ahead and blame the Dutch. Turns out the Dutch invented that word too. The English variation stems from the Dutch word *baas*, which was first used in 1620 as the title for a ship's captain. Many believe that Americans adopted the word boss to avoid the word 'master', which implied slave subordinates rather than 'free' labourers.

DELECTABLE DUTCH

As the Dutch travelled the world, they left many a culinary delight behind. Take for instance the words **cookie** (from the Dutch *koekje/koekie*), **booze** (from the Dutch *busen*, to 'drink heavily'), **brandy** (from the Dutch *brandewijn*, 'burned wine'), **snack** (from the Dutch *snakken*), **scone** (shortened from the Dutch *schoonbrood*), **waffle** (from the Dutch *wafel*) and, our personal favourite, **gin** (from the Dutch *jenever*).

During the Golden Age, the Dutch were the most prosperous nation in Europe and, as a result, experienced a burgeoning arts and cultural scene. Enormous quantities of art were produced and sold in this period – with over 1.3 million Dutch paintings completed from 1640-1660 alone. With the proliferation of Dutch art also came an abundance of new artistic terms. Words such as **easel** (from the Dutch ezel, 'donkey'), **etch** (from Dutch ets or etsen), **landscape** (from the Dutch landschap), and **sketch** (from the Dutch schets) artfully made their way into the English vocabulary.

SIMILARITIES

Having now lived in the Netherlands on and off for over a decade (*gasp!*), I've had more than my fair share of exposure to both languages and their commonalities. They say Dutch is one of the easiest languages to learn for native English speakers. Is this true? Do all the loanwords make its mastery a breeze? I'd love to say yes, but many a foreigner would agree that, although the Dutch and English languages have a lot in common, their differences are still great and plentiful. Alike or not, don't let that stop you from diving in head first, spotting the similarities, and learning a little bit of history along the way. **Succes** (good luck)!

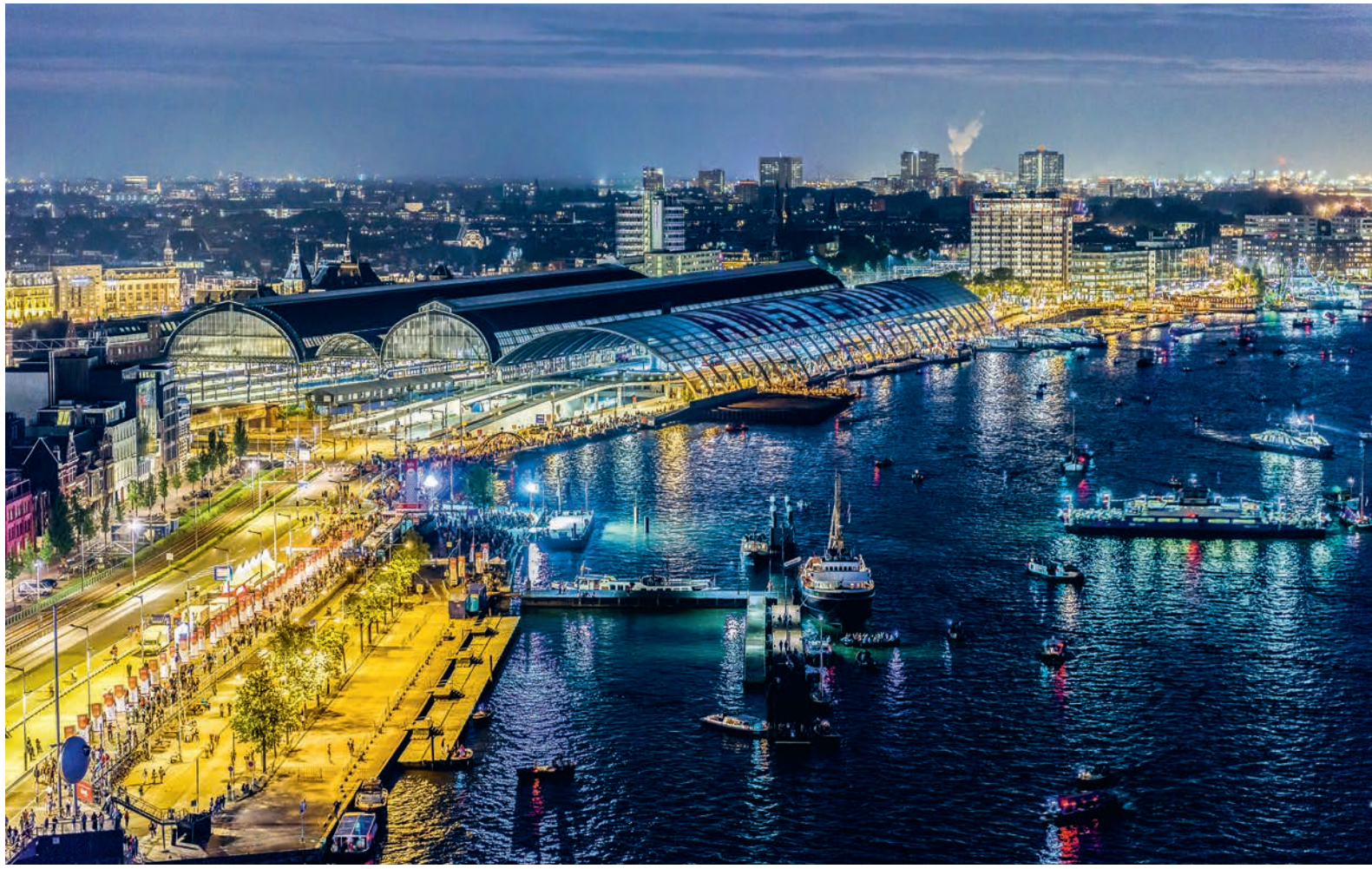
'If your modern day frustrations start and end with your boss, you can go ahead and blame the Dutch. Turns out the Dutch invented that word too'

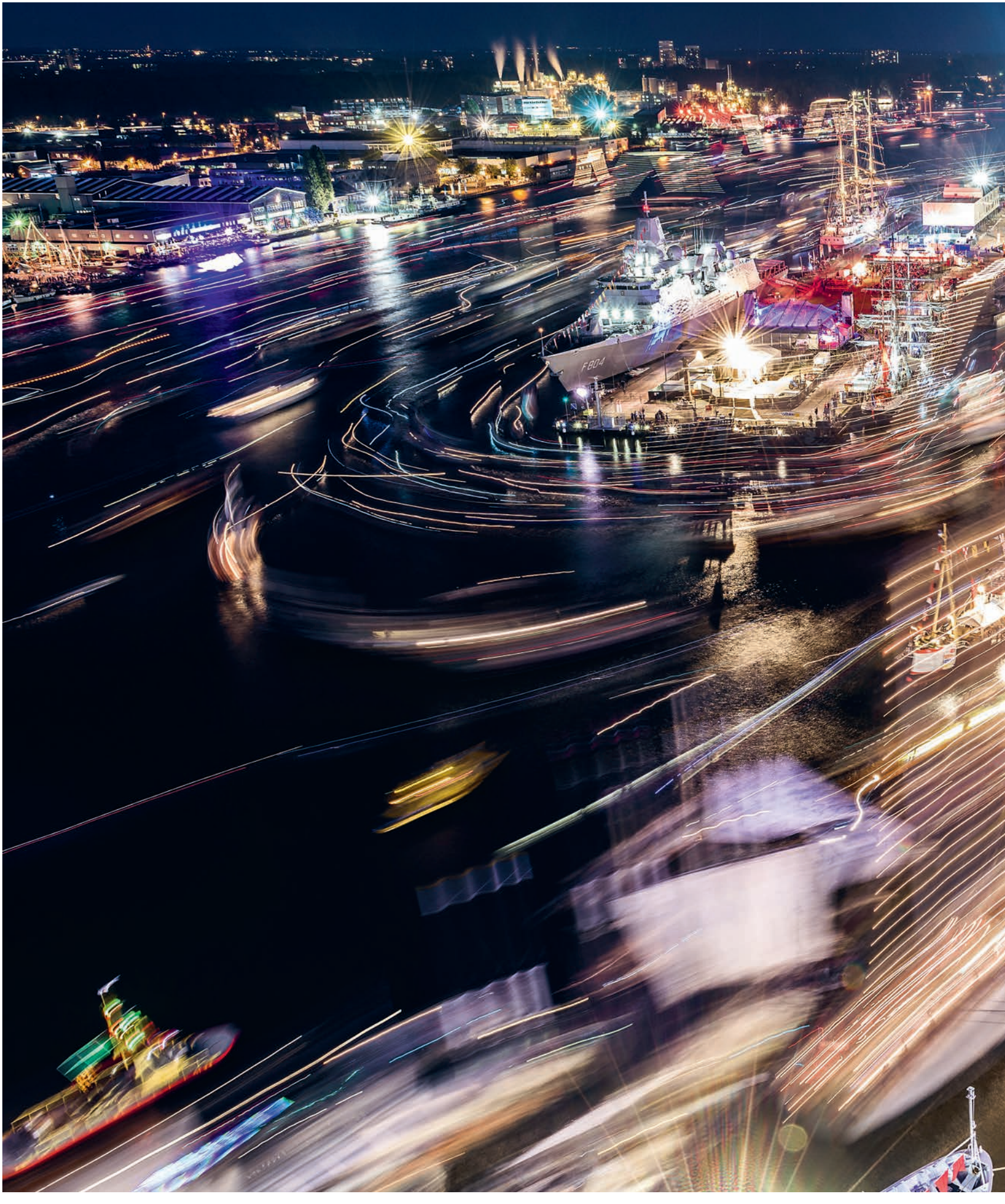
Amsterdam by night

Views from above

At the age of 22, photographer Renzo Gerritsen has made a name for himself with this series of night views of Amsterdam.
A student at the University of Applied Photography in Amsterdam, his photos have been published in international magazines and his night portrait of the Amsterdam Central Station area won a contest by IKEA, and is now sold in IKEA stores worldwide as an iconic image of Amsterdam.
Challenged by the fact that mobile phone cameras have made photography ubiquitous, Gerritsen goes to extremes to get shots from unique angles that no one has taken before. One of the results is a beatuful series of timelapse photos of SAIL, the world's largest boating event, hosted by Amsterdam every five years.

Above: View of Central Station and Amsterdam centre from the A'DAM Tower in Amsterdam Noord
Page 30: The busy roads, waterways and bike parking just in front of Central Station lead to the Damrak, the city's 'red carpet' entrance
Page 31: Central Station and the IJ River; north bank of the IJ River with the new A'DAM Tower
Page 32 : The Eastern Docklands pulse with activity during Amsterdam SAIL 2015

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EVENTS IN AMS

text Steven McCarron


photo: Erik Kabik

Holland Festival

One of the biggest arts and performance festivals in the world, the Holland Festival takes over Amsterdam for much of June, bringing the world's top theatrical and musical talents to the city to unleash cutting-edge productions and world premieres. Big names for 2016 include the Kronos Quartet, Simon McBurney, Damon Albarn and Rirkrit Tiravanija. A special European theme runs throughout the programming this year to mark the Dutch Presidency of the Council of the EU.

4-26 June 2016 | various locations | www.hollandfestival.nl

Modern Japan

When you think of Japanese prints, typically it's the woodblock artworks of Hokusai and other illustrious peers from his era that spring to mind. But naturally, the art of Japanese prints continued to develop over the centuries, and the artworks from Elise Wessels's collection, which will be shown at the Rijksmuseum, reflect the changes that took place in Japan during the first half of the 20th century, capturing the spirit of youth, urban development and Bohemian attitudes.

24 June-11 September 2016 | Rijksmuseum | www.rijksmuseum.nl


Dancer, Kobayakawa Kiyoshi; Collection Elise Wessels

Startup Fest Europe

This festival of start-up-themed events aims to showcase the potential of Amsterdam – and the Netherlands as a whole – as an international capital for start-ups and entrepreneurs. It brings together founders, investors, business leaders and developers to discuss specific themes. The kick-off event for the 2016 edition takes place at the Beurs van Berlage in Amsterdam, with the city hosting different events each day, such as the Energy Fest, Mobile Convention and closing party. Dutch Prime Minister Mark Rutte will participate this year.

24-28 May 2016 | various locations | www.startupfesteurope.com

TNW Conference Europe 2016

This spring, Amsterdam plays host to the 11th annual conference hosted by The Next Web (TNW), an immense gathering that brings together 20,000 of the world's top technology leaders, venture capitalists and entrepreneurs. A vibrant combination of business development, thought-leading content and endless networking opportunities takes place across eight stages, 300 exhibitor pavilions and more than 100 fringe events dedicated to the future of technology, innovation, marketing, communication and imagination.

26 & 27 May 2016 | various locations | www.thenextweb.com

2016

May

24-28 Startup Fest Europe

26-27 TNW Conference Europe 2016

June

4-26 Holland Festival

24 'Modern Japan' Opens

EuroPride

Amsterdam Gay Pride is one of the city's most colourful summer events. In 2016, the party spirit is ramped up even higher as EuroPride comes to town, presenting Amsterdam as the European capital of LGBTQ pride. As well as a spectacular canal parade, expect to find a wealth of parties, performances, meetings and hundreds of thousands of (international) participants and visitors.

23 July-7 August 2016 | various locations | www.amsterdamgaypride.nl | www.europride.com

photo: Team Peter Stigter

Mercedes-Benz FashionWeek Amsterdam

Fashion Week in Amsterdam continues to go from strength to strength. Over recent editions, it's evolved from an industry event to an all-inclusive fashion spectacle. The public can get up close and personal with Dutch and international fashion houses at the main catwalk shows, while external programming at cultural locations around the city bridges the worlds of fashion, art, music, film and performance.

July & January 2016 | various locations | www.fashionweek.nl

IBC

Whether you're a media professional or creative hobbyist, join some 50,000 international visitors and 1,300 exhibitors at IBC 2016. Encompassing every nook and cranny of the gigantic RAI Amsterdam complex, IBC is a bustling conference and exhibition that showcases state-of-the-art media technology while offering unrivalled networking opportunities for media professionals involved in content creation, management and delivery.

8-13 September 2016 | RAI Amsterdam | www.ibc.org

Robeco SummerNights

Let your hair down in Amsterdam this summer. The city's Royal Concertgebouw concert hall is a global attraction and every year, during the months of July and August, it unfastens its top button and invites you to party with the finest international names in classical, jazz, Latin and pop music. An equivalent to London's Proms, the vibe is festive, relaxed and the programming packs plenty of surprises.

July-August 2016 | Royal Concertgebouw | www.robecosummernights.nl

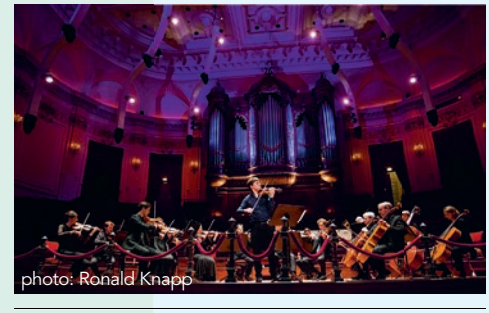


photo: Ronald Knapp

European Athletics Championships | Amsterdam 2016

As anticipation for the 2016 Summer Olympics in Rio de Janeiro builds, and track stars vie to reach their very best form, Europe's top athletes are set to gather at Amsterdam's iconic Olympic Stadium, built originally for the 1928 Games. Dutch sprinter Dafne Schippers will certainly have the locals spurring her on, but you're sure to find top track & field talent at every single session, all hoping to get into the habit of winning gold.

6-10 July 2016 | Olympic Stadium | www.amsterdam2016.org

EVENTS IN AMS

IDFA

The International Documentary Film Festival Amsterdam (IDFA) is an annual event of international renown, transforming Amsterdam's city centre into a paradise for documentary film fans every November. The hundreds of documentaries featured are often as poetic as they are powerful, taking viewers on a journey of cinematic discovery as they tell extraordinary stories about life – revealing and moving, shocking or funny – and provide a look at the world from a huge variety of perspectives.

16-27 November 2016 | various locations | www.idfa.nl

photo: Angelo Bonello

Amsterdam Light Festival

This much-loved annual event brightens the dark winter nights with spectacular light installations and sculptures from a line-up of international artists. It's dazzling to see just how much can be achieved with modern LED technology, and the large scale of the festival means that the often extensive artworks are omnipresent, lending an otherworldly feel to urban surroundings – particularly when combined with the glittering canals in the city centre.

1 December 2016-22 January 2017 | various locations | www.amsterdamlightfestival.com

Turn on the lights

De Bijenkorf kicks off the holiday season with this annual theatrical light show, where the facade of the luxury department store is lit up with 600,000 sustainable LED lights. This free event, the historic store's gift to the city, starts at 19:00.

November 2016 | Dam Square | www.iamsterdam.com/en/visiting/whats-on/festivals/overview-cultural-festivals/turn-on-the-lights

TCS Amsterdam Marathon

Hit Amsterdam's roads for one of the world's most beautiful marathons. This annual event starts and finishes at the Olympic Stadium, with a course that showcases the city's canals, architecture and history, as well as the beautiful green spaces along the River Amstel. Even if you aren't participating in the running, thousands take to the streets to cheer on the athletes and donate to good causes.

16 October2016 | citywide | www.tcsamsterdammarathon.nl

Amsterdam Dance Event

Every October, Amsterdam is the world capital of electronic dance music, as the city's pubs, clubs, concert halls and arenas open up their doors to fantastic talents and enthusiastic audiences. Away from the dance floor, a huge conference is not only the place to meet the movers and shakers of the EDM (Electronic Dance Music) world but also technology chiefs, business minds and musical start-ups.

19-23 October 2016 | various locations | www.amsterdam-dance-event.nl

photo: Darryl Adelaar

2016

October
16 TCS Amsterdam Marathon
19-23 Amsterdam Dance Event

November
16-27 IDFA

December
1 December-22 January Amsterdam Light Festival


photo: Kenta Hasegawa


photo: Scheltens & Abbenes

Arita/2016

Celebrate 400 years of iconic Japanese artisanal crafts at a host of special events. Arita is the town where porcelain was first introduced to Japan in 1616 and to this day, dedicated artisans still produce porcelain using special clay made from pulverised stone. Over the centuries, the Netherlands was one of the top importers of these products, which is why a host of design talents have recently visited the area to create contemporary Arita-inspired collections. Anniversary activities in Amsterdam include the *Arita Porcelain Today* exhibition at the Rijksmuseum (until 9 October), while the Lloyd Hotel is unveiling a 'Saga' room designed by INA-MATT.

throughout 2016 | various locations | www.hollandkyushu.com & www.2016arita.com

shareNL

Tap into the sharing community with shareNL. Hosting regular meet-ups in Amsterdam, shareNL is working to build and shape a collaborative economy, in which people find the products, services and knowledge they need through peer-to-peer marketplaces and on-demand systems. While admitting that it's still early days in terms of building a truly collaborative society, the group invites individuals, start-ups, industry experts, academics and politicians to participate in their events – each of which is focused on a different theme.

throughout 2016 | various locations | www.sharenl.nl

Hackathons

Break into the future at one of Amsterdam's Hackathon events, where groups of technical minds and enthusiastic amateurs get together to crack big and small problems with creative solutions – or maybe just to have some hacking fun. Just a few examples of the events taking place include the I amsterdam Museum Night Hackathon, the Amsterdam Smart City Hackathon, Hack the Brain and the HITB Haxpo. These events showcase the power of modern hacking and collaboration, creating a space for making, breaking and building.

throughout 2016 | various locations | www.meetup.com/topics/hackathon/nl/amsterdam

100 years of the Amsterdam School

Wandering through the city, touches of Renaissance and Art Deco design are evident in Amsterdam's beautiful architecture. But it's the intricate brickwork of the Amsterdam School movement that's really left its mark on the city. Discover the stars of this home-grown architecture and design movement as we celebrate its centenary in 2016. You'll find special presentations at Museum Het Schip, a *Living in the Amsterdam School* exhibition at the Stedelijk Museum (until 28 August), plus a host of guided tours that take you out into the city and introduce you to these expressive, uniquely Amsterdam architectural icons.

throughout 2016 | various locations | www.hetschip.nl


photo: Floris Leeuwenberg

Throughout 2016

Arita/2016 | shareNL | Hackathons | 100 years of the Amsterdam School

EVENTS IN AMS

FITC

FITC stands for future, innovation, technology and creativity, and the event is geared towards those working in the fields of design and technology and the numerous areas where they overlap. 'Design. Technology. Cool shit.' is the slogan here, and indeed, the event provides a platform for digital creators of all kinds, such as designers, developers, motion-graphics artists and digital artists.

February 2017 | Pakhuis de Zwijger | www.fitc.ca

photo: FITC

Integrated Systems Europe 2017

Integrated Systems Europe (ISE) is the world's fastest-growing and best-attended show in the professional AV and electronic systems space, once again taking over all 12 halls of RAI Amsterdam. Maintaining its reputation for connecting new technologies, companies and end-user industries, ISE presents an exciting show floor featuring more than 1,000 product launches, as well as a packed programme full of education and events.

7-10 February 2017 | RAI Amsterdam | www.iseurope.org

photo: Cris Toala Olivares

King's Day

You haven't seen Amsterdam at its best and brightest until you've experienced the annual King's Day festivities in the city. On King Willem-Alexander's birthday Amsterdam becomes an orange playground for all ages, thanks to dance parties and festivals, thousands of boats in the canals, street markets and fun activities for young and old. Join hundreds of thousands of others in celebrating the king in whichever style suits you.

27 April 2017 | citywide | www.iamsterdam.com/kingsday

IamExpat Fair

The IamExpat Fair is a meeting place for expats and local businesses. It aims to connect and support the expat community, helping people to find services and businesses, learn how to navigate life in the Netherlands, and connect with other expats, organisations and the international community. The event hosts stands from dozens of companies and organisations working in housing, careers, education, expat services, health, leisure and family needs, while workshops make the experience all the more vibrant.

25 March 2017 | Westergasfabriek | www.iamexpatfair.nl

2017

February — FITC — 7-10 Integrated Systems Europe 2017

March — 25 IamExpat Fair

April — 27 King's Day

One design with 1001 stories: Dutch design Amsterdam

photo: Ilco Kemmere

In February 2016, the I amsterdam Store opened its doors in the IJ-passage at Amsterdam Central Station. The creative director of the store concept is Joachim Baan. With more than 10 years experience in the world of communications and design, Joachim's passion lies in developing and revitalising brands, and the I amsterdam Store is his latest success story. The store is an inviting place for anyone who wants to be inspired by Amsterdam's most beautiful and iconic brands and stories.

One iconic Amsterdam-based name is design company Ahrend. 'Ahrend has been setting the tone in Dutch design for more than 100 years, so it was logical for me to contact them first to explore the possibilities of working together,' says Baan. 'We decided to integrate Ahrend's playful and highly modular Loungescape line, designed by Basten Leijh, in the store concept. With a variety of lounge elements, we created a place where visitors to the crowded Amsterdam Central Station can come to relax and enjoy a quiet environment.'

When it came to finding the right person to design a fabric to upholster the Ahrend Loungescape, the decision was an easy one to make. Borre Akkersdijk, founder of ByBorre, is a young Amsterdam-based designer who, in 2012, won the Dutch Design Award's MINI Young Designer Award. Akkersdijk, whose ByBorre label is characterized by the self-developed innovative knitting techniques that bring the digital and tactile worlds together, was given free rein to design a unique fabric for the Ahrend Loungescape. The result is an exclusive and beautiful textile with natural depth in both texture and colour, which delivers a stunning look and feel and entices people to sit down and relax in the store.

Looking back, the idea for the store was born over drinks in De Ysbreeker, an Amsterdam café, where Baan brought all the involved parties together and the creative ideas started to flow. 'I love creating sophisticated designs that have more to them than initially meets the eye,' says Baan. 'Be it in materials, form, history and/or production. In fact, it's only when you take a look at this specific design from above that you will notice it takes the form of a cross. A subtle touch of mine that refers to the iconic St. Andrew's Crosses of Amsterdam. That's what I love about this design: It looks stunning and it is highly functional. And I could tell you 1,001 stories about it.'

iamsterdam.com/store | joachimbaan.com | ahrend.com | byborre.com

I amsterdam

Pitch perfect

Over the last decade, Amsterdam's advertising scene has bloomed dramatically, and the city now sits alongside (and often above) the world's traditional hubs

text Matt Farquharson

photo: Wieden + Kennedy Amsterdam

By the numbers

The city's creative industries, in figures

Amsterdam employs **196,000** people in 'creative and cultural industries'.
It is the **fourth-largest** creative employer in Europe, by number of staff, behind the much bigger cities of London, Paris and Milan.
It is Europe's second-largest centre for software industry employment, with **48,000** staff, second only to Paris.
The Amsterdam ad industry employs **20,000** people. London's employs **25,000**.
The Dutch advertising and market-research industries are worth **€8** billion.
Sources: European Cluster Observatory; Statista

'Amsterdam is having a creative renaissance, and the work that is coming from a handful of small shops is truly world-class' (Martin Peters Ginsborg, Executive Creative Director, Anomaly)

It's an €8 billion industry run from tilting canal houses built for 16th-century merchants. A place where ideas dreamt up while cycling along cobbled streets are served to 100 million Americans on Super Bowl Sunday. If Don Draper were an adman today, he'd have given up martinis on Madison for the creative hothouses on the Herengracht.

'Amsterdam is having a creative renaissance, and the work that is coming from a handful of small shops is truly world-class,' says Martin Peters Ginsborg, Executive Creative Director (ECD) at local firm Anomaly. 'What's impressive is the flexibility and diversity of scale. Amsterdam produces everything from global campaigns for iconic mega-brands to smaller projects for local start-ups.'

His fellow ECD, Lars Jorgensen, puts it down to the creative minds to be found here. 'The fact that we all live in a city built below sea level is a great testament to the kind of unreasonable thinking this city was founded on.'

And that creative buzz reaches beyond the city's adland – which is mostly clustered around the picturesque Canal Belt – to fashion, art collectives and tech start-ups. 'The pioneers, traders and sea-faring folk of the past made Amsterdam into a city that is a real melting pot. It's where the friction is and creativity flourishes,' says Kerrie Finch, founder of PR agency FinchFactor. 'It's like no other city in that it is truly international. The UK thinks it's international, but it's incredibly parochial: it's British, London, Soho, and they only talk to each other. France is very French, Germany's very German, but Amsterdam is global, thanks to the mix of people.'

Al Moseley, President and Chief Creative Officer at 180 Amsterdam, agrees: 'New York and London are very much about themselves. They are megacities, but inward looking. Amsterdam is a small city in comparison but has an outward view, which it's had for more than 400 years.'

TALENT MAGNET

That genuinely global view is a recurrent theme when speaking to some of the local industry's leading lights. Moseley has more than 20 nationalities on his staff, while the local office of Wieden and Kennedy (W+K Amsterdam) claims 25 and 72andSunny a whopping 26. At Anomaly, there are 10 in a staff of 45.

'We have a very diverse group,' says Anomaly's Jorgensen. 'People who have worked all over the world and have ended up here because of the city's international calibre, the buzzing creative energy and community, and because of the agencies and their can-do attitude. Add to that a work-life balance that you will not find elsewhere, and you have the perfect cocktail.'

Over at 180 Amsterdam, Moseley reckons that, 'Creative people want to come to the city because it is very easy and rewarding to live and work here. Life is simple, leaving you time to work on the important stuff that moves the world on.'

Amsterdam Worldwide is another local shop with a global view, and founder Brian Elliott believes that while 'word of the quality of life and high creativity has spread rapidly', the ease of hiring international talent makes a big difference. 'All levels of government have helped to make incoming businesses and people welcome, with a special, dedicated one-stop service. This makes it easy for talent and it flocks here.'

BIG BRANDS

That ease of doing business doesn't just apply to the ad industry, but to the broader world as well, and a host of big brands have their global or European HQs here. As Victor Knaap, CEO of digital production company MediaMonks, explains, 'Since the mid-1990s, we've seen an influx of global brands. The first was Nike, which led to a cascade of others, including Netflix, adidas, Sonos and Calvin Klein.'

And along with the big names from abroad, of course, Amsterdam has its own global players. Heineken's HQ is a 10-minute bike ride from the home of Booking.com or Philips, while the big Dutch financial institutions and Shell are just a short train ride away.

But, according to Finch, the local agencies do not thrive on proximity alone. 'I've been here 15 years and seen it really change from a city that only had one internationally focused agency,' she says. 'Today, it's normal that international companies will come to Amsterdam specifically to seek a creative lead. It's normal that an American or Asian company might look at five agencies and they'll all be in Amsterdam, even if the buyer has no base here.'

top photo: 72andSunny
bottom photo: Wieden + Kennedy Amsterdam

Why we're here

Wieden and Kennedy was the first US ad agency to set up in Amsterdam, and when 72andSunny was looking for a European base, it eschewed London for the leafy canals of the Dutch capital. So, why are these renowned international agencies here?

'It helps that a large number of global brands have their global or European headquarters located in and around Amsterdam,' says Blake Harrop, MD of W+K Amsterdam. 'It allows for a healthy ecosystem of competing agencies and production companies to exist. It's a cosmopolitan city, and agencies are full of international creative people. With young brands growing into new markets, and mature brands consolidating their marketing operations, there are plenty of global marketing issues needing creative solutions from agencies.'

For Nic Owen, MD of 72andSunny, it's a similar story. 'It's a very open culture, and that attracts open-minded people, making it easier to find the right talent. The system here helps us hire good people from around the world, and that mix lets us play around with who works with whom, allowing us to create truly global work. It's a place that combines evolved thinking with high craft.'

Fashion forward

The advertising industry has brought Amsterdam's creative industries to global attention, but the city is also a hotbed of fashion and design. Alongside the global high-street success stories of G-Star Raw, Suitsupply, and Scotch & Soda, there are the high-end designers such as Iris van Herpen and Viktor & Rolf, as well as a host of other talents bubbling away just beneath the surface. Designer Jessica Joyce is a member of the Muze fashion collective. 'Amsterdam's creative industry is doing so well because the Dutch are pioneers and embrace new technology and knowledge sharing,' she says. 'Being open-minded and not afraid to share or experiment in modern thinking, Amsterdam has become a fertile ground for creative innovation.'

The city has the world's highest concentration of jeans brands, with the city's denim industry thought to turn over about €500 billion a year.

INNOVATION

Ultimately, the success of any creative industry comes down to the quality of the ideas on offer. The global repositioning of men's deodorant Axe/Lynx, for example (see 'The big hits'), was the work of 72andSunny's European office in Amsterdam. As MD Nic Owen explains, 'We were able to give them a very progressive, provocative positioning that they couldn't get anywhere else in the world.'

Founded in Amsterdam in 2001, MediaMonks is now the largest (and generally considered the most impressive) firm of its kind on earth. According to CEO Knaap, 'The advertising industry is relatively young here. It means we're more open to breaking the rules and challenging the norms. We don't do dogmatic thinking. The city's rebellious reputation and laid-back sprit makes it an attractive place for aspiring creatives.'

Over at 180 Amsterdam, Moseley reiterates the city's standing as a place for innovation. 'Amsterdam has a great history of challenging the status quo and is famous for its innovative ideas in the world of television, technology and marketing.'

THE AMSTERDAM APPROACH

For all the internationalism, there are certain aspects of the Dutch national culture that seep through into agencies here. Thriftiness and being direct are, the stereotype goes, ingrained into Dutch culture, and both are good news for clients who might be used to bloated agencies talking in circles.

'The Dutch culture of openness and directness empowers creatives to push things just a little bit further. Amsterdam-based agencies are more confident to discuss daring concepts with their clients,' says Ivo Roefs, CO-CEO of DDB & Tribal Worldwide Amsterdam. 'Another aspect that the ad industry does differently here is the smart, cost-effective execution of operationally complex concepts. It's used to working with budgets that are less extensive than in New York and London, and is trained in finding solutions to deliver the maximum within these limitations.'

That efficiency permeates throughout Amsterdam agencies, according to Anomaly's Peters Ginsborg. 'Reduced bureaucracy, smaller organisations and the elimination of layers means that everyone working on an account is personally involved and engaged in the quality of the work,' he says.

'Without gigantic budgets, we've had to be lean and mean,' adds MediaMonks's Knaap, 'so we're constantly pushing for smart and effective, as oppose to big.'

THE LAST WORD

The last word goes to Canadian expat Brian Elliott, who is so fond of the city that he named his agency – Amsterdam Worldwide – after it. 'There are many fine creative cities in the world, but the elements that combine to raise Amsterdam up are hard to beat. Amsterdam is connected – physically and digitally – with the world. The transport and infrastructure are world-class and long-established. Everything just works. Amsterdam is culturally open and tolerant, and language forms no barrier. Amsterdam is commercial. This is not a museum city, despite the lovely canals. Business matters. The fiscal climate is stable and predictable, and expats get some tax benefits. And the simple ability to bike to work and see your kids more than on weekends distinguishes Amsterdam from most other international hubs. The quality of life is hard to beat. If only we had mountains and snow, then it would be perfect.' <

clockwise from top left: Brian Elliot, Al Moseley, Blake Harrop, Stephanie Feeney (photo: 72andSunny), Victor Knaap (photo: Lukas Göbel)

The big hits
Amsterdam shops regularly turn out award-winning campaigns. Here are three from recent years.

Campaign: Find Your Magic
Client: Axe
Agency: 72andSunny
When Axe/Lynx decided to move away from laddish humour and suggestions that their deodorant might somehow turn guys into a chick magnet, they came to Amsterdam to get a fresh take on what it means to be a man. This campaign completely flips the brand's position and has generated positive PR around the world.

Campaign: Sweetie
Client: Terre des Hommes
Agency: Lemz
Reaching beyond the normal boundaries of advertising, this startling campaign (produced by MediaMonks) led to the identification of over 1,000 paedophiles in 71 countries, arrests around the world and praise from the UN. On behalf of children's-rights group Terre des Hommes, a 3D CGI 10-year-old girl, Sweetie, was created to pose as a sex-camera worker. Operated by a team working in shifts, Sweetie interacted with 20,000 online predators, gathering names, addresses and webcam footage.

Campaign: Write the Future
Client: Nike
Agency: W+K Amsterdam
This is one of the largest campaigns to come out of Amsterdam at a time when it was establishing itself as a global hub for the creative industries. In time for the 2010 World Cup, it saw the fortunes of football stars turn on individual moments of brilliance and despair.

Wonder Wang, CEO of Huawei Technologies Netherlands BV (photo: Huawei Technologies NL)

A networking milestone

Since opening its Amsterdam offices a decade ago, Chinese ICT network, infrastructure and device company Huawei has been forging new connections in both the B2B and B2C markets

Text Hans Kops
photography Amke

DIGITAL CONNECTIVITY

'In many aspects, Dutch and Chinese business professionals are alike. Both are results-driven and innovative. I know that the Dutch are considered to be very direct, but I value that' (Wonder Wang, CEO of Huawei Technologies Netherlands)

When Huawei Technologies set foot in the Netherlands in 2004, it did so to huge media attention. Not only because the Chinese information and communications technology company was now going to have a branch in the Amsterdam Metropolitan Area, but also – and especially – because it had already won a deal worth millions of dollars to deliver an advanced wireless network. The excitement was in itself understandable. After all, the reliability and stability of the ICT infrastructure in a data-driven economy and society is of great strategic importance, and so entrusting the delivery of such a vital data-transport-network component to a partner that was, at that time, relatively unknown in Europe was a big step to make.

But launching-customer Telfort found Huawei's proposal the most attractive, both technologically and financially. And so, the Dutch operator granted the internationally rapidly expanding and highly innovative Huawei the chance to prove itself on the European growth market of carrier networks.

'This Dutch project is still a milestone for our European operation,' says Wonder Wang, CEO of Huawei Technologies Netherlands. 'It was the start of a long-term journey, one that has seen us really grow and expand our business activities in the years since we first came here.'

BROADBAND LAND

Since then, ten million residents in the Netherlands are now fully or partially dependent on Huawei networks, components, smartphones, tablets and business solutions for their digital connectivity and mobile access. The Dutch arm of the company, which started off with just four employees, has become a major player and employer in 'broadband land', the Netherlands. After the breakthrough with the Telfort deal, Huawei Technologies Netherlands now employs 650 people and delivers the platform and components for the current 4G network of KPN (the formerly state-owned company that acquired Telfort).

In addition to this, more and more companies, research institutions and individual customers are using Huawei's services and products. Two examples include football and events stadium Amsterdam ArenA, whose Wi-Fi network was set up by Huawei (a project that led to a business partnership with football club Ajax), and the Belastingdienst (Tax Authorities), whose systems have been converted to Huawei technology. When it comes to the consumer market, demand for Huawei smartphones and tablets has begun to rise, and a promising partnership with Dutch company Philips Healthcare, specialists in medical technology, has also been announced.

'We are one of the key players now,' says Wang. 'But this comes with a big responsibility, one that grows bigger with the success of our business. Now that we are integrated into the Dutch business community, we feel an even stronger commitment to deliver stable, sustainable and reliable network solutions, products and services.'

AN UNUSUAL STRATEGY

Huawei Technologies is one of the jewels in the Chinese growth-model crown. Founded in 1987 by businessman Ren Zhengfei, it has grown from a small privately owned company in the metropolis of Shenzhen to the world's leading ICT-solutions provider. Huawei now has more than 170,000 employees in 170 countries, and with more than 70,000 registered patents, it is also the most imaginative and innovative company of the last decade.

Through its massive amounts of R&D work, Huawei has long been devoted to the improvement of technologies for network platforms and connections. In addition to this, the company has also been developing and selling smartphones and tablets for a few years now, and it supports and advises organisations in establishing and maintaining the most appropriate ICT infrastructure.

These are also the three pillars of the Dutch branch, explains Wang from Huawei's European Enterprise Exhibition Centre, the company's office in Amstelveen. On the wall opposite him, Huawei's motto, 'Building a Better Connected World', is painted in large letters. 'When we announced this strategy, I was asked by many CEOs and CIOs in my network if this was a wise move,' he says. 'They told me: "Wonder, you cannot simultaneously succeed in business-to-business and business-to-consumer markets." But, at Huawei, we see things differently. 'Everything we do is about interconnectivity. We lay out the networks for the distribution of data, we help corporations and public organisations to store and process their data in a secure environment, and we deliver devices to end users so that they have their data at their disposal anywhere and at any time they like. We feel that all ICT businesses are related and, if you work in the information business, should be part of your proposition. I am sure that this decision gives us a huge competitive edge now. Especially since we are rather unique in this. Most of our competitors are still afraid of the complexity of this kind of business integration.'

THE EUROPEAN NETWORK

Whatever the case, it gave Huawei a huge push in Europe, and sales in the Netherlands are also developing at a promising rate. 'Because of their larger volumes, Germany and France are our main markets in Europe, but the Netherlands is not far behind. And that is a remarkable achievement; the Netherlands is a pioneer market when it comes to the field of ICT. Lots of technologies and applications are launched or tested here, and that makes it more interesting for Huawei to be part of this business network.'

It gives Huawei Technologies Netherlands a special position in the European network. As the company's European headquarters are located in Düsseldorf, Germany, the Dutch office has the status of Competence Centre. Powered by the reputation that the Netherlands is the logistics gateway to continental Europe, Wang and his team have successfully claimed the role of logistics hub further. Partly because Eindhoven, which lies approximately 100 km south of Amsterdam, has been chosen as the site for their new European distribution centre for smartphones and ICT components. 'It was a pretty exciting moment when the decision for the site was being made,' says Wang. 'Germany pushed for Hamburg, the French opted for Le Havre and Belgium wanted Antwerp. But ultimately, the head office opted for the combination of Rotterdam and Eindhoven. Rotterdam is the largest port in Europe and guarantees us a stable and reliable supply of materials. The connections to and from Eindhoven are good, and by having our central distribution centre there, we are positioned relatively close to our largest markets and near some important buyers of our products.'


IT Infrastructure
HUAWEI
Ping Test

A COUNTRY WITH AN EDGE

For Wang, who came to the Amsterdam Metropolitan Area in 2012 as Global Key Account Director for KPN and was promoted to CEO of Huawei Technologies Netherlands one year later, the Netherlands still has an edge. He has felt at home here since day one.

Like many content expats, he sums up almost mechanically the list of benefits he and his compatriots enjoy: housing and living costs are low (especially if you compare them to what his London colleagues have to pay); the city is safe and accessible (particularly Amstelveen, where he often works); there are several international schools (which also offer Chinese in their curricula); for a frequent flyer, it is reassuring to know that in just the space of half an hour, you can move from office chair to airplane seat; everyone speaks English and is more or less internationally oriented; there is a Chinese bank (ICBC) that facilitates payments with his homeland; and the welcome and support from the people of amsterdam inbusiness (the service that, on behalf of the Amsterdam Metropolitan Area, invites new companies to the region, helps existing businesses find a suitable location and the right business services, and mediates in the application of [residence] permits) is great. In fact, thanks to their intercession, the Dutch Prime Minister Mark Rutte was willing to personally open Huawei's new 10,000 m2 distribution centre.

OPEN ECOSYSTEM

As a manager, Wang – who studied economy and telecommunications at the Chinese equivalent of an Ivy League university – is especially fascinated by the accessibility and openness of the business ecosystem. 'Dutch people are in general very open, transparent, internationally oriented and straightforward,' Wang says. 'Before coming here, I worked in several other countries, but never have I related so well to the culture of doing business as I do here. In many aspects, Dutch and Chinese business professionals are alike. Both are results-driven and innovative. I know that the Dutch are considered to be very direct, but I value that. Especially with business partners. You know where you stand, and that makes me feel comfortable.'

Wang works with a team comprised of 13 nationalities, and most of his co-workers are Dutch. When dealing with them all, the Huawei Technologies Netherlands CEO has learned to use a different form of direction. 'Traditionally, the Chinese way of managing is to take a centralised approach, but the Dutch like to first discuss everything together and then to make a decision. Huawei is now an international enterprise, and so getting such buy-in is very important indeed. But in the Netherlands, things go one step further, and that is very valuable to me. Because once a consensus is reached, everyone is happy and everyone feels a personal responsibility to comply with the agreements.'

When Wang is asked whether he is concerned that the Huawei DNA might change in this business culture, he laughs out loud. 'It is important not to focus on the cultural differences, but on the similarities. And as I said before, there are plenty of those here.' <

Ten million residents in the Netherlands are now fully or partially dependent on Huawei for their digital connectivity and mobile access

Who's Wonder Wang?

Wonder (in Mandarin Chinese: Dexian) Wang studied economics and telecommunications engineering at the Beijing University of Telecommunications. He joined Huawei and was first stationed at the facility in Bangladesh. He worked closely with global telecommunications companies such as Telenor, Singtel and Axiata and was appointed Managing Director in 2009. In 2012, Wang was appointed as Global Key Account Director for KPN, and he moved to the Netherlands where, a year later, he was appointed CEO of Huawei Technologies Netherlands BV. Wang sees it as his main task to develop the Dutch Huawei operations further and to strengthen and broaden relationships with customers and stakeholders.

Jos Nijhuis, CEO of Amsterdam Airport Schiphol
photo: Robin Utrecht/Hollandse Hoogte

A high-flying century

Schiphol Airport celebrates its centenary in 2016. CEO Jos Nijhuis explains how it went from a shed in a field to one of the world's largest aviation hubs, and what comes next

text Matt Farquharson

Facts and figures

Schiphol Airport serves **322** destinations around the world.
It transports **1.6** million tonnes of cargo per year.
31% of travellers are on business.
58.2 million passengers used Schiphol Airport in 2015.
39.5% of passengers are in transit.
Schiphol has **five** main runways.
28.4% of the airport's waste is separated and recycled.
Schiphol employs more than **65,000** people at about **500** companies.
The airport contributes **€30** billion per year to the Dutch economy.
The connection to Amsterdam Central Station is **<15 minutes** by train.

Schiphol has set the sustainable goal of generating 30% less CO2 in 2020 at its location than in 1990, and currently has 3,000 m2 of solar panels

There isn't much of a market for domestic flights in the Netherlands. In fact, if you want to take to the air within its borders, you'll need to charter an aircraft of your own. The last scheduled domestic flights – Amsterdam to Maastricht – ended in 2008. Given that it takes less than three hours (and only €25) to make the journey by train, it's perhaps surprising that they lasted so long.

But as is so often the case in the Netherlands, those limitations have been turned to an advantage. 'Our home carrier, KLM, was forced to work with a relatively small direct catchment area,' explains Jos Nijhuis, CEO of Amsterdam Airport Schiphol. 'Being entrepreneurs, many decades ago they adopted the concept of a hub and spoke model, to allow the Netherlands to have good connectivity.'

For 'hub and spoke', imagine an elaborate wagon wheel, with Amsterdam as the centre point. With enough spokes reaching outwards, if you are a traveller in, say, Leeds and hoping to get to Bucharest, it makes little difference if you change planes in Amsterdam or Heathrow. The more extensive the network of spokes, the more likely you are to go via the hub in the middle. The case is even clearer if you're flying between the Americas and Africa or Asia with a change in Europe.

'London has a very strong business community. Everybody needs to travel to London,' says Nijhuis, 'so they don't have to convince passengers to use Heathrow Airport. But we have to for Amsterdam. The reasons Schiphol grew are purely economics: the limited catchment area of the Netherlands makes an extensive network with frequent flights essential.'

As a result, Schiphol currently serves more than 320 destinations worldwide, and almost 40% of its passengers are people transferring to a connecting flight. Only 33% of the total passengers are Dutch nationals. 'Our connectivity with the UK covers twenty-six destinations, while Heathrow has seven,' Nijhuis gives as an example. 'This is a matter of decades of hard work, of course. But we benefit from the successful model developed by KLM.'

THE TRIANGLE OF COOPERATION

Schiphol Airport began in 1916 as a grass field on reclaimed land. Today, it is the 13th busiest airport in the world by aircraft movements, ahead of larger cities such as Hong Kong, New York's JFK, Shanghai and Munich. It is Europe's fifth-busiest airport by annual number of passengers.

Much of the growth that has taken place over the last century can be attributed to the cooperation between KLM, Schiphol and the Dutch government.

'Together, KLM and Schiphol made it work, with the government arranging bilateral agreements that helped with long-haul destinations,' says Nijhuis.

'You see it also happening in the Middle East, of course, where everything is connected to the government, and the airline and airport form a very strong triangle. Basically, KLM, Schiphol and the Dutch government are doing the same, but initiated it decades ago.'

THE QUICK CHANGE

For a hub airport such as Schiphol to remain attractive, travellers need to know that their interchange will run smoothly. 'Everything is focused on guaranteeing a short connection time of 40 minutes,' Nijhuis explains. 'Our connectivity is the foundation of our success. And the fact that we are still a one-roof terminal. You don't have to hop from one terminal to another.'

And, while Schiphol Airport has more than 20 airside restaurants and scores of shops, travel convenience always comes first. 'We don't have to make money on everything happening at the airport. Ambiance is very important,' says Nijhuis.

'An airport is not a shopping mall. Retail and food and beverage are important to the airport, and they should be of appropriate quality, but they should never interfere with the smooth process for the passenger. I'm not sure that I'm very much in favour of all those walk-through stores in airports. I don't know if the passenger really likes that. It's up to the passenger to decide how – and even, if – to spend their money.'

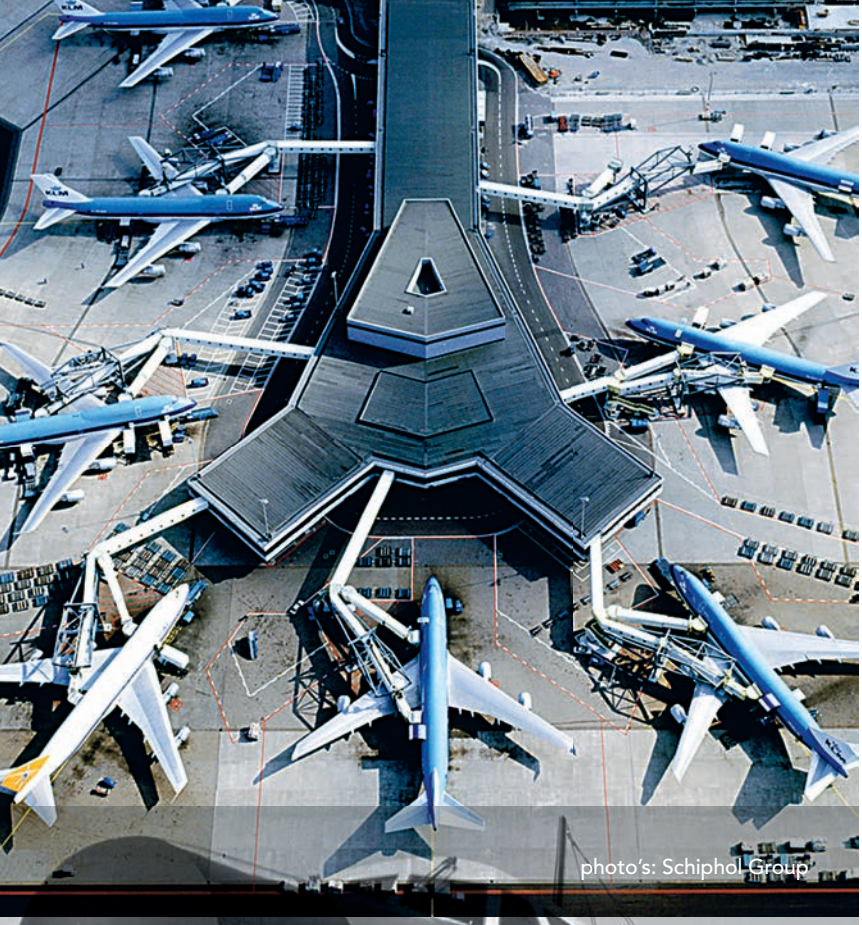
For those keen to linger, however, the airport does offer up spas, a casino, a library and a small outpost of the Rijksmuseum – but none of these interfere with the flow of passengers to (or between) planes.

THE NEXT DECADE

In 2013, Schiphol launched a 'masterplan', with a view to increase the airport's capacity to handle 85 million passengers a year by 2025. In 2015, that number had already reached almost 60 million.

Phase one included a shift to a centralised security system, which is now complete. Larger and slicker than the previous system, it further eases the flow of passengers through the airport.

'We had central security in the Schengen Area, but not the non-Schengen Area,' says Nijhuis. The Schengen agreement allows travel within most mainland EU states (plus Norway and Switzerland) without showing your passport. Moving to a central security system for all passengers, Nijhuis says, 'provided us with a possibility to set up security as a service.



photo's: Schiphol Group

The last 100 years

The land where Schiphol Airport sits should really be under water. The airport is 4.5 metres below sea level and the Schiphol area was once a large lake. But like 17% of the Netherlands, it was drained and the land reclaimed.

While the first flight took place in 1916, commercial flights didn't begin until KLM took to the air after WWI.

Some 20 years of steady growth, mostly under the stewardship of Schiphol's 'father' Jan Dellaert, came to an abrupt halt with WWII. It was captured by the Germans in 1940, and then bombed so heavily by the Allies that, by the end of 1943, it was rendered unusable.

But in peacetime, it quickly bloomed again, servicing its first post-war flight (a Douglas DC-3) on 8 July 1945.

As the site developed, it gobbled up the small town of Rijk, which was demolished as Schiphol became the main airport for the Netherlands.

In the late 1960s, designer Benno Wissing introduced the distinctive green and yellow signage that remains a much-studied design classic to this day, and has since been updated by Dutch designer Paul Mijksenaar.

A fifh main runway was added in 2003 and, by 2012, the airport had welcomed more than one billion passengers. In 2013, construction activities began to ensure capacity and quality for the future. This has already seen the airport shift to a new centralised security system and includes plans to expand to handle 85 million passengers a year (30 million more than it handled in 2014) by 2025.

The first flight

On 19 September 1916, on a muddy stretch of land reclaimed from a boggy lake, there sat a few plain wooden warehouses. With WWI raging across Europe, and to little fanfare or record, Schiphol opened as a military airbase and the first biplanes to use it were almost as frail as the wooden sheds serving them.

KLM was founded in 1919, and the airline's first commercial flight took to the air on 17 May 1920: a Havilland D.H. 16 G-EALU hopping over the channel to London, with space for two passengers (one in a converted bomber's seat). The captain was British pilot Jerry Shaw.

photo: Raimond Wouda

It is an area where we try to differentiate ourselves from our competitors. You don't want to be at risk on a plane, and security should be a thorough process because it guarantees safety on board. But you can provide that security as a service instead of a hassle.'

The Schiphol approach was to try and give passengers maximum flexibility and to keep queuing to a minimum.

'I find that, in other airports, I'm always behind someone who is much slower than I would like them to be. That's because, if you are an experienced traveller, you know exactly what to take out of your bag, what to take out of your pocket. Through our new security concept, you have the possibility to naturally pass a slower passenger just in front of you, without putting unnecessary pressure on them.'

There was also a considerable effort put into what Nijhuis calls 'the ambience of the security experience' and the combinations of light and fragrance.

'We use natural lighting and different light intensities. We use natural materials so people feel at ease, and not stressed because the security process is already stressful enough. We do whatever we can to compensate that. The area where you have to pack your bag again has a slightly stronger light so that you don't forget stuff,' Nijhuis explains.

The next stages of the masterplan include a new pier and terminal expansion.

GROWING SUSTAINABLY

Air travel has a considerable impact on the planet's CO2 emissions. It's an unavoidable consequence of burning aviation fuel, but there are ways to mitigate the broader environmental impact of air travel.

'Sustainability for the airport and aviation sector as a whole is of incredible importance,' says Nijhuis. 'And sustainability is everything: noise, air pollution, energy consumption and CO2 emissions. I believe that airports should do more than their utmost to take care of their responsibility towards the environment.'

It may sound counterintuitive to hear of an airport with sustainability goals, but in a heavy-polluting industry, every effort makes a difference. KLM is a leading proponent of biofuel for commercial flights, and Schiphol itself is a leading airport for sustainability issues. It has set the goal of generating 30% less CO2 in 2020 than in 1990, and currently has 3,000 m2 of solar panels.

'Consider electrification,' Nijhuis says. 'We have 167 Tesla electric taxis at the airport to move passengers from the airport into the city. That creates a better climate in the city, but of course also at the airport. The same with electric buses for all airside movements. Because all of those buses come back at the end of the day at the same spot, the batteries can be recharged.'

The airport views sustainability in the broadest sense, from community consultations about noise levels to how it manages its supply chain and HR.

'A part of sustainability is also what we call sustainable employment,' Nijhuis explains. 'We should ensure that we treat people fairly, and that all staff at the airport treat visitors fairly. Hospitality and passenger experience are key for us.'

GOING DIGITAL

While Schiphol Airport has impressive physical plans and hopes to bring them about in as sustainable a way as possible, perhaps its biggest goals lie in more technical realms.

'We have the ambition to be the best digital airport in the world. What I mean by that is that we will use technology to create better and more efficient processes to facilitate a seamless passenger journey,' says Nijhuis.

As with the recent work on setting central security, the prime objective is a simpler, smoother passenger journey.

'We can use technology to give passengers much more guidance at the airport, and perhaps even when they're still at home, by helping them decide which public transport they should choose based on traffic. With current technology that would be easy, but as with the security programme, we can do a lot more.'

Nijhuis envisions a passenger experience where all non-essential inconveniences in the airport experience are stripped away. 'Why do we have to show our passport several times at the airport? You could do it once at the entrance to the airport, and then you're recognised, and the system should know where you're going.

But technology can also stop passengers from being an inconvenience to each other.

'You often hear those messages over the speaker: Mr or Mrs Suchandsuch should go to the gate immediately, otherwise their luggage will be offloaded…' says Nijhuis. 'But if we know where the passenger is, because they've logged in with their mobile phone, we can just pick that person out of the queue, if there is a queue, or pick them out of the bar, to ensure that they won't miss their plane.'

With this in mind, Schiphol is the first airport in the world to have full 'Bluetooth beacon' coverage. These beacons allow connected smartphones to access location-based information, such as your position in the building and the best route to the gate, or to automatically show a digital boarding pass when approaching a check-in counter.

So while the future looks bright, it's important to remember the principles that helped this once-muddy field grow to what it is today. 'I believe strongly in how this all started: it's the system of home carrier, airport and government that lets us compete. Part of our long-term success relies on whether we let that system work,' Nijhuis concludes. Given that it's worked so well for the past 100 years, why break a winning formula? <

Whether by boat, car, bus or scooter; via a rental, taxi or leased vehicle, the increasing number of ways to go green in Amsterdam is absolutely electrifying

text Lauren Comiteau

The electric body

Sander Ouwerkerk, Director of Business Development, The New Motion
photo: Mike Roelofs

Sander Ouwerkerk is talking to me from behind the wheel of his 2015 black Tesla. The Director of Business Development at The New Motion is travelling down the A4 from Amsterdam to The Hague to talk to policy makers about a greener Netherlands. His fully electric, practically self-driving vehicle is one of approximately 100,000 electric or hybrid automobiles in this country whose capital, Amsterdam, is leading the petrol-free charge into the future. 'The electric vehicle market is still in its infancy, but in 15 years' time, all cars will be electric,' predicts Ouwerkerk, whose company offers charging solutions for electric cars and provides more than 25,000 charging points, making it the most dense such network in Europe. 'By 2035, the last petrol car will be sold, and the last petrol car will be off the road by 2050.'

'If you fast-forward to 15 years from now, all cars will be electric' (Sander Ouwerkerk, Director of Business Development, The New Motion)

THE GREEN ROAD AHEAD

'The trend today is that usage is more important than ownership,' agrees Margaretha Gerrits, Location Manager for Car2Go Amsterdam, the electric car-sharing service. 'And it's not just for cars; Netflix and Spotify are other examples – having access is the most important thing.'

A subsidiary of Daimler AG, and active in Europe and North America, Car2Go expanded its Amsterdam fleet last year from 300 to 350 Smart electric cars. With the city having the most dense and highly used network of charging stations in the world – some 1,800 at the moment, with an expected rise to 4,000 by 2018 – the infrastructure to go electric is already here. (The city will even install a charging point for anyone with an electric car who does not yet have private access.) Amsterdam is the only city in the world where Car2Go operates with a fully electric fleet.

Art van der Giessen, Project Manager Electric Vehicles for the City of Amsterdam, says that the city's Amsterdam Electric programme is really taking shape. Last year alone, 8,000 users charged their EVs 50,000 times per month, proof that electric mobility is here to stay in Amsterdam. Clean air is a huge part of the city's sustainability agenda – Amsterdam recently became the first European city to announce its goal of as much emissions-free traffic as possible by 2025 – and Van der Giessen says they'll do that through a combination of 'facilitating, stimulating and regulating'.

Take taxis, for example. These heavy road users, of which there are 4,000 in the city, pollute 35 times more than regular cars. To induce taxi companies to make the electric switch, the city is offering a €5,000 subsidy for every electric taxi purchased. And because every fourth taxi at Central Station has to be a clean one, electric cab drivers are always assured of a fare. There are currently 300-400 electric taxis in the city, a number which Van der Giessen says must double in the next four years if the city wants to reach its 2025 emissions-free goal.

ELECTRIC FARES

Taxi Electric and BIOS Schiphol Taxi are two companies taking advantage of the city's incentives. Schiphol Taxi, which has had the airport concession for the past five years, had to include a green aspect in its most recent tender to meet Schiphol's goal of becoming one of the most sustainable airports in the world. The result? BIOS Schiphol Taxi operates 71 Tesla taxis from the airport and will continue to do so until 2022. 'It's not only a result of tendering,' says Martijn van Leeuwen, Secretary of the Board of the BIOS Group. 'Company policy is to focus on sustainable operations. The city wants to clean up the air so that it's a good place to live. Our initiative contributes to that target.'

'It's good the city stimulates demand,' says Ruud Zandvliet, co-founder of Taxi Electric. 'It's a free market, so if you create demand, supply will come.' Taxi Electric was the first taxi company in the world to introduce a fully electric fleet in 2011, and today it operates 40 Tesla Model Ss and Nissan LEAFs. With its focus on service and social responsibility, Taxi Electric hires drivers over the age of 50 who have difficulty competing in the job market. 'We want to show that we can do things differently,' says Zandvliet.

Enter Abel, the electric taxi start-up that launched in the city in January. Trying to bridge the gap between public transport and taxis, Abel lets you book a seat – as opposed to a whole car – via an app. The more flexible you are, including your willingness to ride with others, the lower your costs.

In addition to the electric-car subsidy, Abel's Operations Director, David Baars, points out that the city is investing in fast chargers that can load an EV battery in half an hour compared to the eight hours it takes traditional chargers to do the job. 'The city is really thinking about the future, and we want to be part of that,' he says.

CONNECTIVITY

Abel, in short
Named after Abeltje, a beloved Dutch fictional elevator operator created by children's author Annie M.G. Schmidt, the city's newest taxi service serves its namesake well: its drivers welcome passengers not into elevators like Abeltje, but into 20 fully electric mint-green cars to begin their adventures. You never know who you'll be sitting next to during the ride, says the company, adding an exciting social dimension to your next outing. Booking a seat instead of a car (by app only, with a credit card) helps keep costs down, as does the rider's flexibility. Trying to fill the void between taxis and public transport, a trip to the airport averages €17 (as compared to an average starting price of €40 for the former and €4.50 for the latter). Abel says it's had more customers and trips than it expected since beginning operations in January. 'If we can make Abel a success here, we can make it in other countries, too,' says Operations Director David Baars of the company's future plans.
www.rideabel.com

Tesla, in short
The Apple of EVs, Tesla was founded in 2003 by a group of Silicon Valley engineers. As *the* electric car company, it has come a long way from its exclusive €130,000 2008 Roadster. Tesla's Model S, rolled out in 2012, is ubiquitous in the city, whether as part of Schiphol Taxi's fleet or as the car of choice for leasing company MisterGreen Electric Lease. Passengers and drivers alike say they love its quietness, roominess and, maybe most of all, its hip factor. 'It's the coolest car in town, accelerates fast and is affordable,' says MisterGreen co-founder and General Manager Florian Minderop. Worldwide, Tesla says its cars have driven over 1.6 billion electric kilometres, saving more than 150 million litres of fuel. According to Berith Behrens, Tesla's Communications Manager in Benelux, 'Amsterdam is a real Tesla hub.' Its relationship with the city remains a love story: the company has its flagship store on the PC Hooftstraat and its European office in the southeast of the city. Tesla's space-age SUV, the Model X, will be coming to the EU later this year, with a range of 470 km and the ability to accelerate from 0 to 100 km in 3.4 seconds. Stay tuned…
www.teslamotors.com

top photo: Nissan Nederland
centre photo: Diederik van der Laan
bottom photo: Gogoro

USERS BIG AND SMALL

The city's purchase subsidy extends to other heavy-use vehicles as well, such as delivery trucks. International shipping company DHL chose Amsterdam for its electric pilot precisely for that reason. 'It's a very attractive programme,' says Marijn Slabbekoorn, City Logistics Expert at DHL Express. 'We want to go electric in all European cities, so we'll use electric where it's economically and operationally viable.' DHL's corporate responsibility programme aims to reduce CO2 emissions by 30% (vs 2007) by 2020. To that end, they hope to have a 'multi-model transport system' of bikes, electric cars and electric boats in use in Amsterdam by next year.

The city also already has deals with public-transport company GVB for emissions-free buses by 2025. Their city ferries are also slated to meet the green deadline, with permits being granted solely to emissions-free vessels by the quarter-century. This applied to those ubiquitous canal boats, too.

Consumers, too, are expected to do their part. Although there are no direct city subsidies for residents seeking to go electric, Amsterdammers will get priority parking permits for EVs. Tax breaks on the national level and cheap electricity add to the incentive. 'If major cities give the signal, it will give impetus to car manufacturers,' says Van der Giessen. 'They are all working on electric cars and, especially with the diesel scandal, they're doing so faster.'

JUST THE BEGINNING

For those still sceptical about taking the ownership plunge, MisterGreen Electric Lease offers an alternative. Founded in 2008 as an electric scooter-leasing company, it introduced the first electric cars to the Netherlands two years later and now offers a 95% Tesla fleet. 'Cost-wise, people are wary when it comes to buying an electric car, but they're more likely to try it if they can lease it monthly,' says co-founder and General Manager Florian Minderop. 'The electric car will be part of the new ecosystem.'

Yet all agree that the EV is a stepping stone in the wider transition from fossil fuel to alternative energy. 'Now, electricity comes from windmills in the harbour,' says Van der Giessen, 'but the ultimate goal is to connect solar panels in the city directly to charging stations.'

Which is precisely what these forward-thinking companies and the city are preparing for. On sunny days, surplus energy can be stored in an EV's battery, which can later be fed back into the grid. And when the batteries get old, they can be repurposed to store and supply power for buildings. Swapping stations – vending machine-like structures that are sold by electric scooter company Gogoro – also pull from the grid when electricity is cheap and store it for later use.

'Electricity is the patch,' explains The New Motion's Ouwerkerk, making a comparison to the smoking-deterrent nicotine patch. 'Real renewal comes with wind and solar energy. And we need to do it earlier rather than later. It's like saving for a pension.'

As the EV part of the mobility equation evolves, so is the EV itself. Tesla just introduced Summon, its latest autopilot feature. Ouwerkerk's Tesla not only drives him down the highway, but it can park itself, too. 'Autopilot began this process on the highways,' says Berith Behrens, Communications Manager Benelux for Tesla. 'Summon begins it in your garage.' The EV revolution has indeed come home. <

Gogoro, in short

Taipei start-up Gogoro, which offers space-saving, two-wheeled transport solutions via its electric scooters, chose Amsterdam as its pilot European city precisely because of its focus 'on being a leading smart city and for its commitment to embracing innovation that transforms how energy is managed, distributed and utilised,' says Jason Gordon, Gogoro's communications chief. To that end, the company is more than just a scooter business: it's in the power and electric trade, producing smartphone-like charging stations (the GoCharger) and battery swapping stations (the GoStation) that pull electricity from the grid when it's less expensive and store it for later use. When the batteries age, they can be used to power buildings. In its efforts to transform highly polluted megacities into energy-efficient smart cities, Gogoro's electric Smartscooter, launched in 2015, takes up less space on urban streets and, because batteries are already charged at swapping stations, charging time and precious charging space, is eliminated. Users can buy an energy subscription, and with a smartphone-like device, see where batteries are located, make appointments to swap them and even be alerted when their tyres are low. Gogoro has already claimed a third of the scooter market in Taiwan, and has big plans for Amsterdam.
www.gogoro.com

EV-Box

EV-Box was founded in the Netherlands in 2010, when the EV market was still in its infancy. Six years later, and EV-Box is now the largest producer and supplier of EV charging stations and related cloud-based services worldwide. Its 36,000 distinctively LED-ringed charging stations can be found at private homes, workplaces and in public spaces from Shanghai to Amsterdam to Rome. 'Just like how the automobile replaced the horse and carriage, electric vehicles will replace combustion-based automobiles,' says the company. Its role in that transition? 'A charging point at every parking spot, an electric car for every home.' With its new, larger headquarters having just opened on Amsterdam' IJburg island, and a partnership with the city and Dutch energy and construction giants Nuon-Heijmans to increase the number of electric charging stations from its current 1,800 to 4,000 by 2018, it may just accomplish that goal.
www.ev-box.com

The flower connection

At the centre of Holland's substantial floral industry is Royal FloraHolland, the world's largest flower auction conglomerate. CEO Lucas Vos talks to us about trade and connectivity in and around the Amsterdam Metropolitan Area

text Sarah Gehrke
photography Gregor Servais

Lucas Vos is in trouble with his neighbours. As CEO of Royal FloraHolland, he is given a lot of flowers: 'Every week, my florist comes in and brings three new bouquets, and whenever I go to a grower, I get another bouquet,' he says. His solution? 'I give some to my neighbours. The women like me, but all the men hate me because I keep bringing their wives flowers,' he laughs.

Apart from this slight hiccup in neighbourly relations, the floriculture industry is treating Vos well. He came to Royal FloraHolland in 2014 after a five-year stint as CCO at container-shipping conglomerate Maersk in Copenhagen. When he decided to return to the Netherlands, he says, 'I really wanted to do something…Dutch. And well, I couldn't get more Dutch than this!' But there's more than just the 'Dutchness' that fascinates Vos. It's also that the Netherlands is at the heart of floriculture: 'The Dutch basically control every facet of this industry, from breeding and growing through the education sector to financing and trade.'

Royal FloraHolland is the glue that holds it all together. The cooperative is owned by 4,500 primarily Dutch growers, and is an international frontrunner in the floriculture industry. With several sites in the Amsterdam Metropolitan Area and in Zuid-Holland, it's a main hub. The auction sites and the greenhouses, where the flowers are grown, are geographically close – and the customers are nearby, too. With the Netherlands, Germany, France and the UK as his main European markets, Vos says, 'This is the best logistical set-up you can have. It's all concentrated in one place. We're right in the middle of those three main countries, so it's just perfect.'

But these days, things can get more complicated. Flowers are being produced in Kenya and Ethiopia, and customers are not only in Western and Central Europe, but in Russia and China, too. Nevertheless, the flowers are often shipped through the Netherlands, says Vos. 'Since we have the cooling chain so well under control, even our Russian customers tell us that if they fly flowers directly into Moscow, the quality is not as good as when they go to Schiphol Airport and transship via our marketplace before trucking them over to Moscow.' After all, it's the Dutch airlines, KLM and Martinair, that have the expertise in transporting flowers.

Furthermore, Dutch growers offer much more variety. 'You know, Kenya and Ethiopia only offer roses. And every little florist or retail outlet wants to have roses and tulips and chrysanthemums and orchids… so at some place, these big mono flows need to be divided up. And you might as well do that here.'

'This is the best logistical set-up you can have. It's all concentrated in one place. We're right in the centre of our three main European markets, so it's just perfect'

GREEN MOVES

With an expanding base of producers and markets, Vos's background in logistics is certainly helpful in his job at Royal FloraHolland. But he puts it to good use in another role, too. As a member of the Amsterdam Economic Board, he is spearheading a challenge that has been formulated as part of the Amsterdam Sustainability Agenda. 'By 2025, we want to make the Amsterdam Metropolitan Area CO2-neutral when it comes to the transportation of goods. We're now trying to form a coalition under the header of the Amsterdam Economic Board and I'm leading that – primarily because I have a background in shipping and I have a vested interest because of the flower cluster, but also because we have Schiphol Airport here, and we have the Port of Rotterdam, the biggest port in Europe, in our neighbourhood.'

While he admits that there is still a lot of work to be done, the outlook is bright. 'I think the biggest achievement is that the City of Amsterdam has set this ambition and, so far, I've only heard people support it, whether they are in government, in business or in education. Everybody's mobilising behind this target, and that's great. I really feel a big drive, that people want this, they want to have Amsterdam as a model city in that respect. It's not being pushed – there's a pool of private companies that want to make this happen.'

‘I think flowers are part of our DNA. Like Heineken, the Rijksmuseum, Rembrandt… Dutch flowers, in particular tulips, are iconic for us’

AN ATTRACTIVE PURCHASE

At Royal FloraHolland, Vos envisions some changes, too. ‘I think the biggest thing that we’re looking at right now is that a large chunk of the process – the purchase moment, the auctioning moment – is still connected to the physical move.’ Which means that the flowers are transported from the growers to an auction site, where they are then sold and need to be transported again, sometimes to a location near to where they came from. ‘There is some waste in that process. There’s a lot of traffic on the A4 (the highway between The Hague and Amsterdam) that is related to flowers. At certain moments, it’s 40% of the total cargo on the A4. Sometimes, that’s a waste we could have avoided. This is one of the developments that we’re working on, to see if we can take that cost out. That would mean tremendous savings. We could auction the flowers while they are still on the premises of the grower; then we know to whom they’ve been sold and can bring them directly to that customer.’

Currently, just under 50% of flowers sold through Royal FloraHolland are still auctioned (the rest is traded directly between growers and customers, with Royal FloraHolland taking care of the financial transactions.) The auctions are traditional Dutch auctions, which work the other way round from regular ones: prices are displayed on 38 so-called clocks, starting at the highest price and then going down, and buyers wait until the clock has reached a price they feel is right. The biggest customers even have their own dealing rooms with clocks onsite. Vos says between 30% and 40% of the customers buying flowers in the auction are still present at the site, ‘sitting in the benches here’. It’s a true spectacle: huge spaces are filled with flowers waiting to be sold. Despite the auctions taking place early in the morning, at 06:00, they are even a tourist attraction.

But online trading is increasing, with people partaking in the auctions from elsewhere in the world. Will that go further? ‘I think it will,’ says Vos, ‘and that’s what we’re looking at. Our current customers are also asking for that, because they say they can’t get people to get out of bed at 04:00 to drive to the auction site. So, yes, that is a tendency that we see happening and we need to facilitate that.’

While it’s necessary progress, a nostalgic could get a little teary eyed about the eventual demise of the flower auctions and the associated buzz. Is Vos a romantic when it comes to that? ‘Well, you can’t help being a romantic when you see all of this,’ he admits. ‘There’s so much pride in it, and every time we have visitors here they are just amazed by the size of the operation. The site where I’m sitting right now is bigger than Monaco – it’s a huge operation. And it’s also a fascinating combination. Yes, it’s stone-cold logistics, but you handle products that are so delicate, and so tuned in to human emotions. There is no other product that can handle all the emotions. You know – you wouldn’t bring a bottle of wine to a funeral, let’s say. Flowers can deal with every emotion.’ Would he say flowers have a special place in Dutch society? ‘Absolutely. I think they’re part of our DNA. Like Heineken, the Rijksmuseum, Rembrandt… Dutch flowers, in particular tulips, are iconic for us.’ <

Royal FloraHolland, in short

It’s no simple cliché that the Netherlands is the country of flowers. After all, it’s home to Royal FloraHolland, the world’s largest flower-auction conglomerate. It connects its members, 4,500 flower and plant growers from the Netherlands and further afield, with customers around the world (the top five export countries are Germany, France, the UK, Italy and Russia). The figures are mind-boggling: each year, 12.5 billion flowers and plants are sold through Royal FloraHolland, and 20,000 varieties of plants and flowers are on offer. The total surface of the site is 2,600,000 m2 – akin to 400 football fields. Royal FloraHolland has 3,200 employees, and its annual turnover is €4.5 billion. In addition to the auctions, the conglomerate is responsible for many other aspects of the industry, such as marketing and innovation in breeding. But it’s the flower auctions that remain the most visible; they are a tourist attraction, too, with visitors coming to see the millions of colourful flowers, marvel at the sheer size of the operation and enjoy the buzz of the traditional Dutch auction, at which the prices go down rather than up.

photo: Raimond Wouda

photo: mediabank Amsterdam/Marketing

Bike flight

Long known as the city of bikes, Amsterdam's planners and entrepreneurs alike have a lot to teach the rest of the world about cycling, infrastructure and how to deal with the enviable problem of bicycle overload

text Lauren Comiteau

In this city, where there are more bicycles than people, you'd be forgiven for thinking Dutch infants roll out of the womb with wheels in lieu of feet. Toddlers, before fully mastering the art of walking, are often seen scooting around on a *loopfiets*, or walking bike, a peddle-less device where they learn to balance, securing their two-wheeled future. 'Cycling is how we walk,' says Michel Post, formerly of the *Fietsersbond*, or Cyclists's Union. 'It's nothing special; it's something everyone does. It's cheap, fast, easy and fun.'

But in reality, cycling is no more a part of the Dutch genome than it is anyone else's: Amsterdam's cycling prowess is a hard-won combination of urban planning, government spending, people power and, increasingly, business innovation.

Of course it helps that Amsterdam is flat, compact and densely populated, and that the climate is mostly moderate. But investment in cycling infrastructure began in earnest in the 1970s, following a post-war boom in auto reliance that led to unacceptably high death rates for cyclists. At that moment, and following such ill-fated proposals as paving over the city's historic canals to make way for cars, people opted for the present system.

So while the cars that five decades ago haphazardly filled the city's most famous squares – Rembrandtplein and Leidseplein – are gone, in their place are thousands of bicycles, leaving urban planners with the seemingly enviable problem of what to do with them all. 'We are a victim of our own success,' says Pete Jordan, author of *In the City of Bikes*.

STORAGE SOLUTIONS

Today there are some 400-500 km of bicycle paths criss-crossing the city, with an estimated half of all city journeys taking place on two wheels – pretty impressive for what began as an 'elitist pastime' in the 1890s. Sixty-eight percent of every kilometre driven in Amsterdam today is done by bicycle, with Amsterdammers collectively travelling some two million kilometres every single day.

With many of those cyclists being commuters, almost all of the city's 10 train stations have bike-parking problems, with officials recognising that Central Station in particular is now 'worse than the average disorganised messy public space.' Iris van der Horst, as the city's Bike Programme Manager, is tasked with cleaning them up.

'My goal is to make sure there are 40,000 bicycle parking spaces by 2020,' van der Horst says. Central Station will be home to 21,500 of them, distributed over seven different sites, including one under the IJ harbour (yes, underwater!) and another in the northwest corner, where construction is already underway.

'These garages will be of a high standard, and you will want to use them,' she continues. 'They'll be accessible, in good locations and free for the first 24 hours. They'll keep bikes dry and safe from being stolen.' The city is working with a number of partners to accomplish its goals, including the private national train carrier NS.

ON THE RIGHT PATH

Part of the €120 million the city has set aside for its Long-Term Bicycle Plan will go towards new or improved bike lanes to alleviate rush-hour cycling traffic on Amsterdam's busiest routes. Although 'alleviating bike traffic is a positive problem if any', according to van der Horst, the growth of cycle use is straining the city's infrastructure. 'We're trying to give cyclists more "green time" and less time waiting at red lights,' she adds, of the effort to keep things moving.

All agree that the city needs its cyclists in order to keep Amsterdam accessible and green, the private sector included. International shipping company DHL is using three types of cycles to help deliver its cargo. Its City Bike is a standard racing bike that its couriers use with backpacks. The Parcycle, developed in Amsterdam and now used in 52 European cities, features a 160-litre locker in front, while the Cubicycle has one cubic metre of volume in the back.

'Bikes in the city can be twice as efficient as cars, especially when you're stuck waiting behind a truck on a canal,' says Marijn Slabbekoorn, City Logistics Expert at DHL Express. 'We only opt to do a shipment by car when we can't do it with a bike.'

And they're not the only company to embrace two wheels. Berlin start-up foodora, a higher end food-delivery service, began operations in Amsterdam last year, delivering more upscale restaurant meals solely by bicycle. De Fietsfabriek, once known as the producers of the *it* family-friendly cargo bike, now reaches out mostly to the B2B market. Beer maker Heineken uses its bikes internally to get around, and 43 'ice units' were recently sold to consumer-goods company Unilever, who will test an ice-cream scooper bike later this year.

But much of the innovation still comes from the consumer side. De Fietsfabriek also sells a bicycle to transport disabled people: customers use their own wheelchair to get up a platform, and someone else does the cycling.

Electric-cargo-bike makers Urban Arrow straddle both markets, aiming to move both people and freight the fastest, greenest and quietest way possible. Its bikes are used by local food makers and delivery services such as TringTring and Marleen Kookt, but also by parents such as Marjolijn Hendriksen, who loves her electric cargo bike, especially when it comes to mounting the canals' inclines. 'I can carry three kids and the groceries, talking on my phone while I cycle,' she says atop her silent bike. 'Tourists look on in awe.'

NEW TAKES

If the Dutch aren't quite reinventing the wheel, they are certainly realigning it. Award-winning bicycle maker VANMOOF, which wants to be part of the city's cycling solution, rolled out its first e-bike in 2014, an electric-assisted urban bicycle complete with a GPS tracking system. (And in this particular case, VANMOOF literally did reinvent the wheel, placing the bike's motor in its front tyre.)

Six bikes that had been stolen, in Amsterdam, Berlin and even Florida, were found via the tracking system. The company is now working on getting GPS into non-electric bikes. According to Assistant Brand Manager Tessa Hofte Koesveld, theft is the origin of so many of the city's biking problems. 'We believe the problem with many unruly parking spots is that people leave their old, ugly bikes parked there because they're scared that new ones will get stolen,' she says. 'If we can get over the theft problem, we can get rid of the traffic problem.'

The city, says Iris van der Horst, is experimenting with so-called 'smart spaces'. In February, it started a pilot project near Leidseplein, where sensors on bike racks can detect how long a cycle has been parked. Most racks are 80% full, with many of the bikes sitting there unused for months, which eventually have to be cleared away. The city is hoping the sensors provide a more accurate picture of how and when the racks are being used (or abused), and that one day cyclists will even be able to reserve their own parking spaces via this ever-evolving technology.

With cities worldwide, from London to New York, investing heavily in bike infrastructure, Amsterdam has know-how to spare. 'If we can do it here,' says VANMOOF's Koesveld, 'we can teach the world how to bike.' <

top photo: Diederik van der Laan
bottom photo: foodora

Foodora, in short

The 2014 Berlin food-delivery start-up foodora began operations in Amsterdam in May of last year, delivering meals from high-quality restaurants not usually associated with the take-out market. And they do it solely by bicycle. A custom-made and eye-catching pink box atop the bicycle keeps food warm and, says Country Manager of the Netherlands, Vincent Hosman. 'Bikes fit better into the culture in Amsterdam, which is such a bike city where it's easy and quick to get around.' Although the company still uses scooters outside the Netherlands, many of foodora's restaurant partners don't want to be associated with helmet-wearing couriers on mopeds. 'They prefer a different approach, one that comes across as more friendly.' Now delivering in 32 cities worldwide, foodora it recently began operations in the Dutch cities of The Hague and Utrecht. But with 275 of its 400 restaurant partners located in Amsterdam, the 500 of its 700 bike-based deliverers can be found cycling through the Dutch capital's streets.

Up and away

Embraer's impressive growth and role in renewing KLM's Cityhopper fleet has seen the company open its European headquarters in Amsterdam

text Matt Farquharson
photography KLM

When we think of Brazil, we tend to think of football, favelas and flamboyantly clad Carnival dancers – and not of vast aeronautical enterprises. After all, this is the land of samba, sun and toned bodies on golden beaches; heavy industry comes in some way down the list of common associations.

But Brazil is also home to Embraer, a €3.6 billion-a-year business that is the third-largest commercial jet manufacturer in the world, leading the pack that chases Airbus and Boeing.

Embraer currently has more than 19,000 staff and delivers around 200 aircraft per year. Since 2007, a steady flow of those planes have been heading to Dutch airline KLM Cityhopper, prompting the Brazilian firm to move its European Headquarters to Amsterdam. To be closer to its Dutch client is obviously the first reason to do so, but not the only one, says CEO Frederico Curado: 'Amsterdam has always been an enterprising city, embracing industries and companies that want to have a global footprint. We appreciate its transportation tradition, based on its excellent location and vanguardist approach to business. Also, Amsterdam is a powerhouse of multicultural talent, bringing diversity that every company can benefit from.'

It's part of a strategy that Curado refers to as the company's 'evolution from being a Brazilian company that exports to the world to a global company headquartered in Brazil'.

Embraer in numbers

- **19,000+** staff.
- **1,000+** executive jets delivered to more than 50 countries.
- **8,000+** planes delivered in total (including 1,200+ E-Jets).
- **Third** largest manufacturer of commercial jets in the world.
- **€5.2** billion net revenue in 2015
- European headquarters located in Amsterdam


KLM
EMBRAER
KLM Cityhopper
AIR FRANCE KLM
EXD-661
KLM

Beyond its native land, Embraer now has half a dozen offices in the US, seven in Europe (including Amsterdam), two in China and one each in Dubai and Singapore.
The European market now accounts for 11% of revenues the firm, which supplies aircraft to 70 different airline fleets plus militaries around the world.

The European market now accounts for 11% of the firm's revenues, and it supplies aircraft to 70 different airline fleets

HUMBLE BEGINNINGS

But Brazilian aviation had somewhat humbler origins. After the Brazilian government set up an Aeronautics Ministry in the 1940s, the first aircraft produced (by the Aeronautical Center of Technology, or CTA) was the remarkable Convertiplano, a kind of giant predecessor to today's camera drones. It had four propellers, one for each corner, so it could hover upwards like a helicopter before flying forwards like a plane. Large-scale commercial success did not follow.
It wasn't until the late 1969, when the government established Embraer Brasileira de Aeronáutica and began producing the EMB 110 Bandeirante, the first medium-sized commercial craft to come out of Brazil (whose first prototypes were also developed by the CTA), that Brazilian aeronautics became a viable operation. Alongside military contracts, Embraer developed a niche in small, commercial airliners, led by the twin turboprop commuter, the EMB 120 Brasilia.
But things only really began to bloom with privatisation in the early 1990s. After decades of slow development, Embraer, like much of the Brazilian economy, was hit hard by the global recession of the early 1990s. Amid sudden staff cuts and on the verge of bankruptcy, the airline was privatised in 1994, its investors partly attracted by the newly developed EMB 145, a regional jet that could be built and operated for little more than a turboprop and that could seat 50 passengers. The firm's future was secure, as was its target market, and as its offering expanded to small business jets and regional airliners with around 40 to 120 seats, business blossomed.

SPREADING ITS WINGS

The privatised Embraer really began to take off after the Paris Air Show in 1999, thanks to the launch of the E-Jet family of planes. Almost 1,200 of these have been delivered since 2004, making Embraer the world's largest supplier of commercial jets seating up to 120 passengers. Another 750 are on order or optioned, and the range has now been sold to more than 50 countries.
The planes are particularly popular with low-cost and short-haul carriers. Republic Airlines ordered 191 E-Jets, and JetBlue and Compass have more than 60, as does Shuttle America, with another 55 on order. For most airlines in that market, it often comes down to a straight choice between Embraer's E-Jets or Bombardier's C Series, and the Canadian and Brazilian rivals find themselves duking it out for tenders across the globe.
The company's growth has run alongside successful forays into the private jet business, too. Embraer's Phenom, Legacy and Lineage families range from the very light Phenom 100, which seats just four, to the Lineage 1000: a variant of the E190 passenger jet (which seats 100), but laid out as a private plane with roomy seating for just 19.
While trips on those might be few and far between for the average passenger, the growing fleet of Embraers used by Cityhopper (on course to be 40+ planes by 2018) means there's a good chance you'll come across one the next time you take a short hop from Amsterdam's Schiphol Airport. <

Growing with Cityhopper

As the name suggests, Cityhopper is a short-haul airline for trips within Europe. Launched in 1991 as a subsidiary of KLM, it now serves more than 40 destinations across the continent, including an extensive network in the UK and Germany, which between them claim almost three quarters of the airline's destinations.
For only having begun less than a decade ago, Embraer and KLM's relationship has bloomed quickly. In 2007, the airline began to renew its fleet of short-haul planes – which had until then been exclusively Fokkers – with a bulk order of Embraer E-Jets: specifically, six E170s and 10 E190s. The E-Jet range has been heralded as leading Embraer's growth in the small-airliner market. At the time of the first agreement, Cityhopper MD Michel Coumans noted, 'The E190's improved comfort and performance, while reducing emissions and considerably improving the environmental impact of our fleet.' Fokkers continue to be phased out and replaced with Embraer craft, which will eventually account for the whole fleet.
The most recent addition included two new E175s, with the airline swung by positive feedback from customers on the seating in the E190s, as well as, according to current MD Boet Kreiken, 'the operational reliability, the advanced maintenance technology, the fuel consumption and CO2 footprint', as well as the 'attractive economics' that make the range popular with carriers big and small.

Jet's new set

photo: Herman Wouters

Jet Airways has selected Amsterdam as it's European hub, bringing more choice for direct connections to Mumbai, Delhi and Toronto

text Matt Farquharson

'India's trade relations with the Netherlands go back over 400 years,' says Samir Chada, general manager of Jet Airways Benelux. 'And the recent meeting between the Prime Ministers of India and the Netherlands has given a new impetus to this relationship.'

While that may be true, there are more direct reasons, other than cordial relations between PMs Narendra Modi and Mark Rutte, for Jet Airways, India's second-largest airline, choosing Amsterdam as its European hub. India exports around €6.5 billion worth of goods and services to the Netherlands each year, about the same as it exports to Germany and a little less than it does to the UK. And the Indian community in the Netherlands is thought to number more than 215,000, making it the third-largest in Europe after the UK and France.

'Amsterdam is one of the great cities of the world and has emerged as a top business centre and tourism destination in Europe,' says Chada. 'There is a large demand for travel between India and Amsterdam, both for business and tourism. Mumbai and Delhi, India's two most important cities, are Jet Airways hubs, and they offer easy connectivity for Jet Airways customers across its vast domestic network.'

That network covers more than 70 destinations, around 50 of which are within India. Its fleet of more than 100 includes new A330-300s for Amsterdam-India flights.

DECIDING FACTORS

So, why Amsterdam as a hub, rather than any other European airport?

'Market size, connectivity opportunities, alliances and partnerships, and competitive scenarios are all factors that influence an airline's network decisions,' says Chada. 'The large India-Amsterdam market, connectivity opportunities at Schiphol Airport, as well as our planned cooperation with KLM and Delta have been key influences.

'Amsterdam offers several advantages as a gateway. It is a major European and transatlantic hub airport, and in partnership with KLM and Delta we can now offer our customers one-stop access across Europe and North America, including to 30 European destinations through codeshares, which is significantly higher than we were able to offer before. Furthermore, we will also be able to offer codeshare connectivity to 11 points across the US and Canada, with inaugural flights from India and Toronto to Amsterdam having taken place in March of this year.' <

Bas Beekman and Ruben Nieuwenhuis, programme directors, StartupAmsterdam

Europe's start-up capital

Collaboration between public and private parties is essential in improving the ecosystem for start-ups. Case in point is Startup-Amsterdam, the programme designed to position Amsterdam as one of the top three start-up hubs in Europe

text Bert Bukman
photography Mike Roelofs

The next Booking.com, TomTom, WeTransfer, Adyen or Takeaway.com. This is what Bas Beekman and Ruben Nieuwenhuis would like to see materialise. 'Amsterdam should should be the city where great ideas are born,' Beekman says, 'from where they spread all over the world.' This is the start-up model, as defined by Silicon Valley: 'A start-up is an organisation formed to search for a repeatable and scalable business model."

Remarkably, companies such as these often have their roots in Amsterdam, 'which is a good thing for us as a city,' says Beekman. 'Start-ups bring dynamism and strengthen Amsterdam's reputation with the rest of the world. The local economy also benefits, not least because these innovative companies create new jobs. A recent study by the OECD showed that start-ups provide four times greater employment growth than other businesses. And, when it comes to the labour market, we need to be able to meet this demand in the coming years.'

When it comes to providing an example of this contribution to employment, Nieuwenhuis doesn't need to think twice. 'Recently, Bas and I were at the Marineterrein, a rapidly developing part of the city,' he says. 'We had a meeting with the CEO of Catawiki, Europe's fastest-growing auction house. It's an ambitious start-up that experienced tremendous growth in 2015 and, naturally, the CEO wants Catawiki to continue to grow, but he needs more staff for that. "I'm looking for 120 good people, and I need them now," he told us. That attitude shows just how important such a business is for the city. But it is also a challenge to find these kind of people so quickly.'

B. Amsterdam, a city in a building

'Relax, meet, work, create, think.' Those are the words that adorn the entrance to Johan Huizingalaan 763A, a former IBM office situated in the (at first sight) uninspiring Riekerpolder. But once you step inside B. Amsterdam, you step into a different world. Vibrant colours, large rooms bustling with people, a bar, a lounge, a foosball table and a brightly-painted Trabant.

The building stood empty for 11 years before founders Ricardo van Loenen, Guus Meulendijks and Bas van Veggel transformed it into a playground for start-ups. Not only is it home to start-ups, it also houses the B. Startup School, an initiative run in co-operation with StartupAmsterdam (see 'Talent pool of the future'). The founders of B. Amsterdam wanted to create a city within a building, and it's a goal that they are well on their way to achieving, with plenty of young companies already having settled here. Yippie, Team Academy, 3D studio Th3rd, Startupbootcamp – they've all moved in. Digital and data accelerator Newcraft Group even left its villa in the chic Koningslaan in Amsterdam Zuid and took over most of the fourth floor. 'We'd outgrown the Vondelpark area,' says Martijn Haanappel, founder of Newcraft. 'We were looking for a different energy, more space and more freedom. We looked all over Amsterdam and felt most at home at B. Amsterdam; it's ideal for us and our next phase of development.'

And so, the place is filled with many different tenants, the most striking of which perhaps is IBM itself. The computer giant has returned to its former home after all these years because the presence of so many young, hard-working entrepreneurs brings with it many business opportunities.

HELPING THEM FLOURISH

Beekman, who is connected to the Amsterdam City Council's Department of Economic Affairs, and entrepreneur Ruben Nieuwenhuis are programme directors of the StartupAmsterdam initiative. StartupAmsterdam is a vision and action programme designed to position Amsterdam as one of the top three start-up hubs in Europe. A public-private initiative, StartupAmsterdam represents the joint ambitions of the Amsterdam start-up community and the City of Amsterdam to accelerate the start-up scene. The framework of the programme consists of fifteen measures that are based on the five pillars a start-up needs in order to flourish: talent, users and customers, content, capital and a start-up-minded environment. The programme is operated and overseen by a quick-response team, which works to ensure that these measures are implemented.

It's no coincidence that the post of Programme Director at StartupAmsterdam is a shared job. 'The collaboration between public and private parties is essential,' says Beekman. 'As a municipal government, it is our job to support and assist new, emerging businesses. We create the conditions in which they can flourish, but it's the companies themselves that have to do all the real work; we're not the appropriate party for that – no matter how much we would like to be. For economic growth and prosperity, you need entrepreneurs. They know the market, and they know what is – and what isn't – possible. Moreover, they speak a different language than we do; a language you need to be able to speak to achieve your goals in this dynamic world.'

An important word in that new language is 'pivot', Nieuwenhuis explains. 'That's a change in strategy that every start-up must be able to make, and make fast. Only then will you have a chance of success. Such a change of course can cover all parts of the business – the sales model, revenue model, partner strategies or approach to distribution, to name a few. Essential to a pivot is "trial and error". Everything is new in this market, and no one knows in advance what exactly you need to do and show. The only way to find out is by putting ideas into practice. It's a matter of experimenting and adjusting your course until you're on the right track.

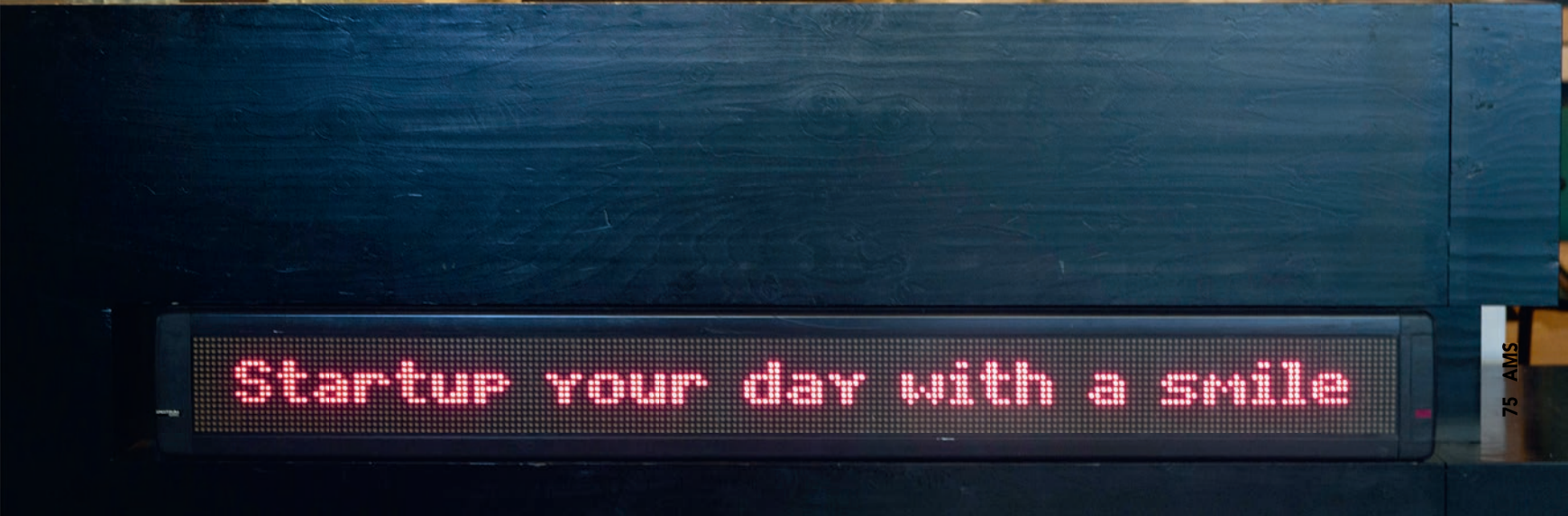
'Companies that can adapt the fastest today are the winners of tomorrow. Take the success story of YouTube: nobody remembers, but YouTube began as an online dating site, and look where they have ended up now.'

THINKING INTERNATIONALLY

StartupAmsterdam aims to further improve the ecosystem for new businesses. 'This ecosystem reflects the resilience and pioneering spirit of commerce that Amsterdam is renowned for,' writes Kajsa Ollongren in the foreword of the vision and action programme. 'These qualities have always been part of the city's DNA.' Ollongren, who is the alderperson for Economic Affairs in Amsterdam, immediately embraced start-ups after taking office in June 2014. 'Amsterdam is an international city that's constantly in flux. Rapidly expanding companies in the technology and creative industries are vital to the city's economy. It's a fast-changing, dynamic economy that presents opportunities to all entrepreneurs, innovators and great minds who feel like an Amsterdammer but think on an international scale.'

To make the start-up a real success, however, requires more than just resilience and entrepreneurial spirit. You need investors, for example, because it takes money to take a new business to great heights.

clockwise from top left: the Newcraft office; Martijn Haanappel, Newcraft; B. Amsterdam



START-UP CITY

'Companies that can adapt the fastest today are the winners of tomorrow' (Ruben Nieuwenhuis of StartupAmsterdam)

Boosting visitor engagement

StartupAmsterdam has made it a priority to develop a launchpad network, which is instrumental in the city's role as gateway to the world. With Launchpad Meetups, during which corporates invite start-ups to present their ideas on challenges the company faces, the launchpad network connects start-ups and multinationals in Amsterdam. Thanks to the launchpad network, corporates discover new technologies and innovative solutions, and start-ups find lead partners and launching customers.

An interesting example is 904Labs. This start-up boosts visitor engagement on websites through better search and recommendations. 'Have you ever had problems finding the right product in an online store?' 904Labs writes on their website. 'Has a news site ever recommended other articles that you have already read? These irritations lead people to quickly leave websites and go to competitors to successfully find information or purchase products. Engaging visitors on a website is necessary to prevent them from leaving, and to avoid the website from losing revenue. This is where 904Labs comes in.'

A well-known company that works closely with 904Labs is Oracle. A while ago, Oracle held a Launchpad Meetup for companies active in the field of Big Data. The challenge was: 'Digital' is the new marketplace for retail, and only retailers who can see and seize opportunities in and with data will succeed in the future. Start-ups were invited to pitch their Big Data solutions, and according to Erik Visser from Oracle Benelux, the event was a big success. 'We organised a Launchpad Meetup because we were looking for interesting and innovative start-ups (from a business development perspective) in Big Data for retail,' he says. 'We're very happy with the outcome and are currently exploring the best collaboration opportunities with 904Labs.'

top photo: Newcraft
bottom photo: B. Amsterdam

And that's something most novice entrepreneurs don't have – or at least, don't have much of. Venture capitalists who see opportunities and who want to set the market in motion can take such entrepreneurs a long way down their path.
One of StartupAmsterdam's goals, therefore, is to bring start-ups and investors together. This is done mainly through the networks of all the people involved in the programme, but also through initiatives such as the Amsterdam Capital Week, an event full of pitches, workshops and all sorts of festivities, as well as a cycling tour where start-ups hop on their bikes and visit 30+ investors in their offices.
An event like Amsterdam Capital Week makes it clear just how important it is to create places where people can physically meet. In this digital day and age, getting together online is all well and good, but it makes no less sense than before to have a place where you can speak to each other face to face, exchange ideas, make plans, drink coffee and crack a few jokes. All of which takes you one step closer to achieving your goal.
Such places can be found dotted throughout the city, and they have the most dynamic names: TQ, Hackers & Founders, StartDock, Spring House, Startup Orgy and B. Amsterdam, to name a few. And you won't always find these co-working spaces in the most expensive locations. On the contrary, B. Amsterdam, one of the largest and most successful examples, can be found in the Riekerpolder, a business park on the outskirts of the city by the A4 motorway.

DAM ON THE AMSTEL

So what really makes Amsterdam so suitable as a basis for successful start-ups? According to writers such as Russell Shorto, the acclaimed American author of *Amsterdam: A History of the World's Most Liberal City*, it has something to do with the culture. People like him praise the spirit of creativity and openness that has been so characteristic of the city's citizens for centuries. In fact, it goes right back to the 13th century, when a dam was built at the mouth of the river Amstel. This dam, from which the city takes its name, turned the area into a perfect trans-shipment harbour, and this resulted in Amsterdam quickly becoming one of the largest and most prosperous cities in Europe.
In addition to the psychological component of creativity and openness, there is also a physical factor: the scale of the city. Despite the growth of the past few centuries, the spatial arrangement of Amsterdam is still influenced by human considerations, such as the fact that almost all locations are accessible on foot or by bike. Add to that the large English-speaking population, excellent international accessibility via nearby Schiphol Airport and the overall availability of exceptionally fast Internet, and you understand precisely why so many innovative digital products and services see the light of day in Amsterdam.
Moreover, the Dutch capital is an attractive and affordable place to live, compared to other European capitals. 'One of the biggest advantages Amsterdam has in the tech world is that it's a place where people want to live – and can actually afford to, even on a start-up budget,' writes *TechCrunch*, an online publisher of technology industry news.

Talent pool of the future

Developing talent is a prerequisite for success. Anywhere, anytime, but definitely in the ever-changing world of start-ups. StartupAmsterdam is acutely aware of this, and with partners like CodeUur, Growth Tribe and B. Amsterdam, it offers a multi-levelled impulse for building the talent pool needed in a start-up environment. It can start in primary school, for example via the Bomberbot programme, in which pupils promise to 'bring programming skills to life'.
The CodeUur initiative fits into this objective, providing programming classes for children aged 11 and 12. The aim is that the children should not only be able to play games, but that they should also be able to build them. Gaining such insights now is just as vital for their future in the labour market as it is for the future of IT. One of the projects designed by StartupAmsterdam, CodeUur and Waag Society is CodePower, a series of courses for teachers teaching them coding basics – because if teachers don't know anything about coding, how can they get their students excited about it?
Another inspiring example is the B. Startup School, where unemployed youth can acquire the skills and talent necessary to find a job at a start-up. In this way, the knife cuts both ways: the youth unemployment rate in the city decreases, and the rapidly-developing start-ups can find and attract the people they need to enable their continued growth.
Regarding the latter objective, the Growth Tribe is an interesting example. It runs a three-month growth-hacking course for those with a bachelor's or master's degree. Participants work in small teams on real projects for real start-ups, as opposed to imaginary scenarios. It's thanks to this kind of growth hacking that companies like Airbnb, Instagram and Dropbox were able to quickly grow from small start-ups to successful global players.

A testbed for innovation

With its abundance of lead partners, launching customers and early adopters and its diverse population, Amsterdam is a natural testbed for innovation. StartupAmsterdam, together with the CTO of Amsterdam, has set up the Startup in Residence incubator programme, in which start-ups develop innovations that address city challenges. The Dutch capital houses renowned accelerators and incubators, such as Rockstart, ACE Venture Lab, the Impact Hub and Startupbootcamp. The last accelerator is located in B. Amsterdam, and was voted Best Startup Accelerator 2014. Their method is simple: Each year, Startupbootcamp runs industry-focused programmes in more countries than any other accelerator in the world. All programmes are located in global innovation hubs, where start-ups spend three months meeting the top mentors, investors and partners in their industry from over 30 countries.

The list of resulting successes is impressive. Since its establishment in 2010, Startupbootcamp has supported 305 start-ups, with each start-up having raised an average of more than €650,000, and the contribution to the labour market is 1,264 FTEs.

In addition to such independent accelerators, there are also those linked to individual companies and organisations. ING Innovation Studio is an example of one for the financial world, where promising start-ups can test their business concept in the banking practice in house at ING, (partially) funded by a loan of €50,000. Just outside Amsterdam, you have the Floriade Accelerator Almere, a programme in which young green pioneers connect the city and horticulture. Participants carry out market research, work on various cases and develop successful formulas for green companies. And last but not least, the Amsterdam ArenA Innovation Center, which is connected to the stadium of the famous Ajax football club, offers an open platform for start-ups, established companies, technicians, students and others to share their ideas regarding major events.

A PLACE IN THE TOP THREE

The main goal of StartupAmsterdam is to secure Amsterdam's spot as one of the top three start-up ecosystems in Europe. The organisation wants more international early-stage start-ups to opt for Amsterdam accelerators and incubators. At the same time, it is important to convince businesses already a little further down their growth path of the opportunities and benefits Amsterdam, with its convenient location, offers them as a European hub.

And it's not just the rest of Europe that is within easy reach; there are also many areas in the Netherlands itself that can contribute to a start-up's success. Amsterdam enjoys strong links with other major tech clusters in the Netherlands, at Eindhoven, Twente, Rotterdam, Utrecht and Delft, which are all less than 90 minutes away. As Ollongren writes: 'The Netherlands has the largest start-up ecosystem in Europe, and Amsterdam is its calling card.'

TRIPLE HELIX

For all these reasons, StartupAmsterdam is closely involved with the national programme, StartupDelta. With former European Commissioner of the Digital Agenda Neelie Kroes at the helm, StartupDelta is a government initiative dedicated to establishing a thriving and competitive ecosystem in the Netherlands and making it the largest start-up ecosystem in Europe. 'Having successful ambassadors such as Neelie Kroes, as well as Mayor of Amsterdam Eberhard van der Laan and Alderperson Kajsa Ollongren, behind us is of great value to StartupAmsterdam,' says Beekman. 'They know the ropes and know who and what we need to be able to move forward.'

'Apart from money and talent, a fertile environment is also an important factor,' adds Nieuwenhuis. 'Inspiring people who all have the same goal, who understand what it's all about, and who are willing to invest not only their money but also their time and energy – those are the people we need at StartupAmsterdam. People from the industry, knowledge institutions and government. People from the "Triple Helix" collaboration.'

StartupAmsterdam is now in its second year, and the first successes can already be seen, says a satisfied Beekman. 'It's hard work,' he admits. 'We have the support and commitment of a small and dedicated team that has gotten a lot done, but there's still a lot more to do. We still have years of work ahead of us. Our goal is to show what we, as a city, can do for each other.'

For Nieuwenhuis, the successes achieved and the appreciation of all the parties involved make all this effort worthwhile. 'It's become so clear to me that we can really make a difference by bringing people together. At StartupAmsterdam, we also have to move fast, just like the companies themselves, but when you get results, you get such a fantastic feeling. You're doing something for a reason. And ultimately, there's nothing more satisfying than that.' <

The start-up race

The Amsterdam metropolitan area has the ambition to be a breeding ground for new national and international entrepreneurial talent and new business models. Alderperson Kajsa Ollongren's aim is to surpass frontrunners like Berlin and London

text Hans Kops
photography Gregor Servais

Kasja Ollongren, alderperson responsible for Economic Affairs and Art & Culture, City of Amsterdam

START-UP CITY

'The Amsterdam brand is the Netherlands' calling card when it comes to promoting itself as a start-up country. It has all the characteristics and location benefits that many entrepreneurs are looking for'

Startling Start-ups

The Amsterdam Metropolitan Area has many successful start-ups. One good example is **Adyen**, a multichannel payment company that offers businesses online, mobile and point-of-sale payment solutions. Founded in 2006, their product is now used worldwide, and Adyen's current market value is estimated at around €2 billion.

This FinTech success story inspired the creation of **Bunq**, which makes payments as consumer friendly as possible by combining a WhatsApp-like application with a payment method.

Peerby is another example of a non-profit start-up. This digital lending platform enables people to rent things they need (like DIY or garden tools, camping gear, kitchenware, party items and more) from others in their neighbourhood, which – according to the website – means there's no need for superfluous possessions and unnecessary expenditure.

Then there is **thromboDx**. This start-up, by Amsterdam-based cancer researcher Tom Würdinger, has developed a test that, with just a single drop of blood, can detect early-stage cancer and risk of metastasis. Illumina, an investment vehicle of philanthropists Jeff Bezos and Bill Gates, has taken a majority stake in the company, and the proceeds will go to funding other start-up ideas.

'We are in a strong position,' says Kajsa Ollongren, who, as Alderperson for Economic Affairs and Arts & Culture, and as the figurehead of StartupAmsterdam, is politically responsible for maintaining the age-old tradition of innovative entrepreneurship in the Dutch capital. 'In all the lists, we are in the top three most attractive start-up locations in Europe. Which isn't surprising as we have a great deal of things to offer start-ups. There is a stable IT infrastructure, for instance. Almost everyone has broadband, which makes the region an ideal testing ground for new digital products and services. Amsterdam is an open-minded and internationally oriented city, where mavericks and talented professionals like to live and work, and it's a city where they can afford to do so too. Starting a business here is easy and inexpensive. There are plenty of starter platforms where new entrepreneurs are actively supported and supervised, and the knowledge and facilities of this city's science and research institutions are increasingly accessible.

'What really stands out for me is that Amsterdam is a city that offers unexpected alliances. Collaborations occur here that would not be so easy to establish elsewhere. This is perhaps our most important selling point for start-ups who are looking for their next phase of growth with regards to markets, capital and partners who can help them further.'

STARTUPAMSTERDAM

To support the city's ambitions of being a hub for entrepreneurs, StartupAmsterdam was set up a year ago as part of a nationwide start-up programme. StartupDelta promotes the Netherlands as a place where start-ups thrive and can grow (faster than anywhere else) into companies that create jobs and develop new markets. The Amsterdam metropolitan area plays a leading role in this, and therefore deserves special attention. Or, as Ollongren says: 'The Amsterdam brand is the Netherlands' calling card when it comes to promoting itself as a start-up country. It has all the characteristics and location benefits that many entrepreneurs are looking for. And we are also the gateway to similar initiatives in other growth centres in the Netherlands, such as the agro-food clusters in Wageningen, the mechatronics cluster around Eindhoven, and Delft's water-management network. StartupDelta is responsible for the overall coordination of the national programme, while StartupAmsterdam is responsible for creating an environment that is as attractive as possible for start-ups in our metropolitan area.'

Like her StartupDelta colleague and former EU commissioner and minister Neelie Kroes, Liberal Democrat Ollongren knows the political path in The Hague and is aware of the importance of attracting enough start-ups with growth opportunities for the future development of the Dutch economy and the city itself. 'We are in a transition period. There are more and more technologies available that require different business models and custom solutions.

Startupbootcamp

Even from our government. Additionally, we can see the emergence of the sharing and circular economies, and we're increasingly competing as a conurbation against a few other major 'smart urban regions' in Europe. To be able to participate in that game – which is something we want to do, and which is something we, as a municipality, have declared as our mission – you need new ideas and concepts. And that's what start-ups have.
'Start-ups are not inhibited or burdened by the past; they tap into new markets, create new jobs and professions that we have not seen before, and pioneer new technologies and applications. Moreover, they revitalise the ecosystem, in the sense that existing businesses are inspired (or forced) by them to renew their own business models. In turn, these existing businesses can help the start-ups reach the market and accompany them in their growth to maturity. All in all, start-ups and scale-ups add much more value this way than they do in percentage of contributions (especially in the first years) to the gross regional product. StartupAmsterdam is there to help them contribute as much as possible as quickly as possible.'

START-UP VISAS

Ollongren spent much of the past year travelling to research inspiring (policy) examples in cities that Amsterdam can emulate. She visited start-up initiatives in San Francisco, Tel Aviv, London, Berlin and New York, and entrepreneurs travelled with her to get acquainted with local start-ups and see if they can work together. Amsterdam itself has now entered into a start-up coalition with New York, with the aim of sharing policy experiences. 'Both cities began conducting an active start-up policy later than, say, San Francisco, but a lot has happened in the meantime, and it appears that, thanks to our dynamic city environments, we now have an edge. We exchange experiences and research with New York: What works for you and why? How have you dealt with this, and what results have been achieved? This way, we don't have to reinvent the wheel each time, and we gather additional support. Paris is to joining us now too.'

Kajsa Ollongren, in short

Kasja Ollongren (1967) has been responsible for the Economic Affairs and Art & Culture portfolios of the Municipal Executive Board since the summer of 2014. As Deputy Mayor, the Liberal Democrat also stands in for the mayor in his absence. Previously, as Secretary General of the Ministry of General Affairs, Ollongren was the highest-ranking public servant in the Netherlands and the right hand of Prime Minister Mark Rutte. In 2011, this position of trust earned her the title Most Influential Woman in the Netherlands.

Start-ups intermingle in co-working offices such as Spaces

What's more, many practical issues have been addressed and problems solved in recent months. As a result, a budding entrepreneur from outside the EU can now apply for a start-up visa, as a close cooperation with the Amsterdam Expatcenter has eased visa applications. Previously, if an entrepreneur came here with promising plans but not such a certain income, they were ineligible for a lengthy stay in the Netherlands. Now, they can appeal for a start-up status. Within a few days, we can determine whether the applicant is legally allowed to stay in the Netherlands for two years and try to build a business here.

'What really stands out for me is that Amsterdam is mainly a city that offers unexpected alliances. Collaborations occur here that would not be so easy to establish elsewhere'

START-UP IN RESIDENCE

In addition to this, there is also StartupAmsterdam's Startup in Residence programme. 'With this programme, the city of Amsterdam acts as a client. We are one of the largest players in the market and use our market position to give initiatives we deem valuable a chance. Therefore we have launched a pilot project in which only start-up companies are allowed to participate. We ask them to develop solutions for seven major urban problems. One such issue is how we can further limit our waste and prepare it for reuse, with a requirement that every collection point must have a chip that informs us if it is ready to be emptied or not. Then there is the problem of abandoned bikes that are no longer functioning: how can we map out where they all are and how can they be collected faster and cheaper? We commission the start-ups to work on these issues for four months and develop groundbreaking solutions. The knife cuts both ways, incidentally. We give start-ups a growth opportunity, while simultaneously introducing a different way of thinking and approach within our own organisation.'

SOCIAL START-UPS

The latter initiative gives a chance to start-ups with a social orientation in particular, social enterprises and non-profit organisations whose primary purpose is to contribute to help solve a social or environmental problem. 'I think Amsterdam is distinguished by our number of social enterprises and the attention we give them. We support many start-up initiatives that place more importance on having an impact than on profit. It's something I'm really proud of, both as an administrator and as a human being. It also fits very well with today's younger generation – they want challenging work that contributes to the things they care about. And so, together with all those concerned – from advocacy groups to research institutions and potential investors – we have set up a Social Enterprise Action Plan.'

AMSTERDAM CAPITAL WEEK

And so, by offering a broad spectrum of initiatives to make Amsterdam attractive to start-ups, the following policy challenge is being tackled: the empirical fact that half of start-up companies cease to exist within just five years of their launch. But now that there is a growing focus on attracting more start-ups to the Amsterdam Metropolitan Area, the goal is to guide them successfully to maturity, to help them grow. 'That's why we are paying extra attention to the programme components that are important in this respect: to ensure that there is sufficient growth capital available, and that promising start-ups and existing corporations join forces to develop markets together,' says Ollongren. 'This year, we organised the very first Amsterdam Capital Week, with the main objective of putting financiers and entrepreneurs in touch with each other and teaching them to understand each other's languages. It was a great success, and we'll now be repeating it on an annual basis.

'There's another good outcome from it too: I am very enthusiastic about initiatives such as TSO Munt Square. It's a physical and digital platform set up by ABN AMRO bank where both large and start-up companies can collaborate on innovative projects and also, for example, share market and organisational knowledge. This way, the cross-fertilisation becomes increasingly more potent, and both types of businesses can build the future together.' <

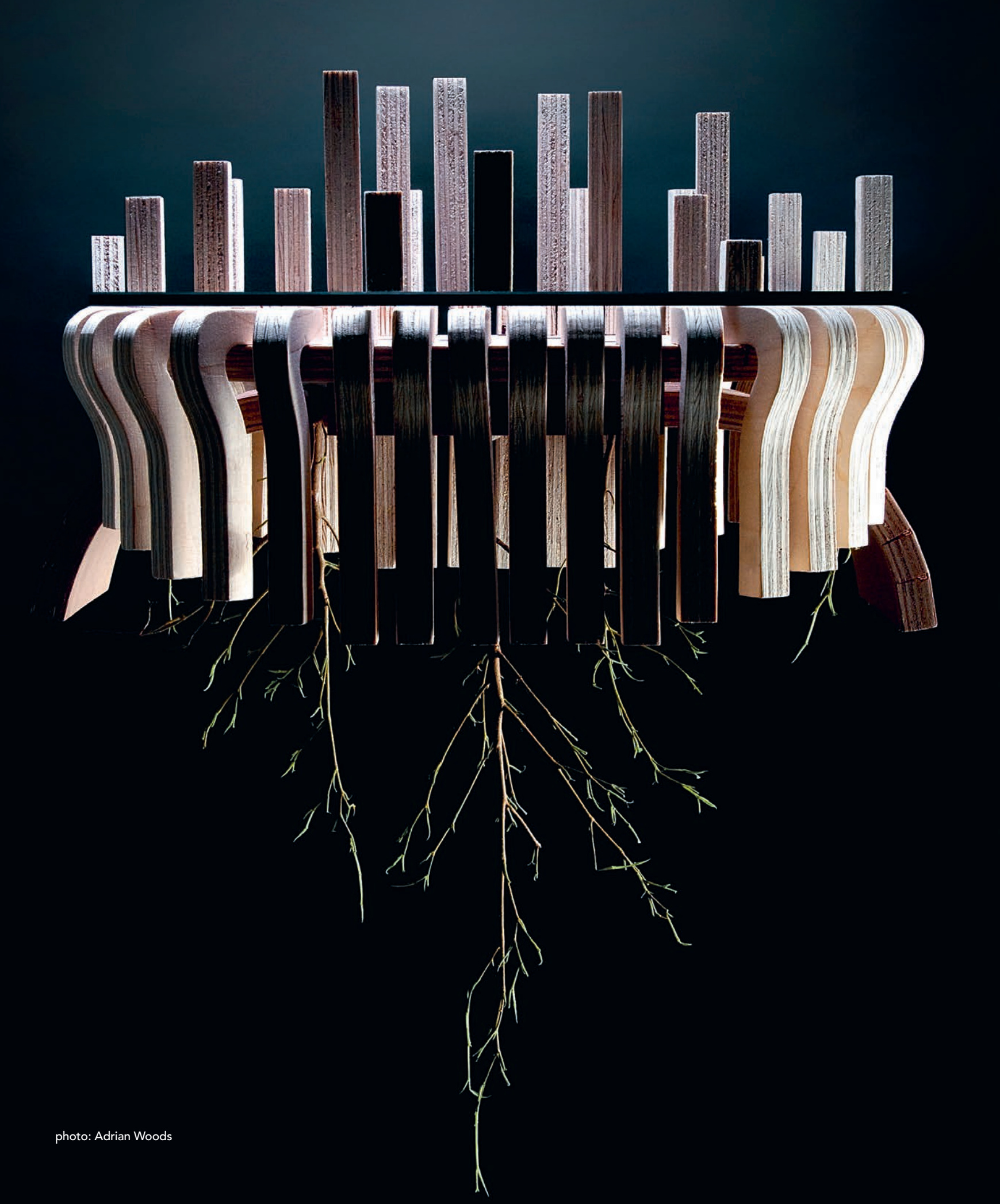


photo: Adrian Woods

A capital venture

Innovation, collaboration and internationalisation are the keystones of Amsterdam's thriving investment ecosystem. These are exciting times for the city's new tech entrepreneurs and their investors

text Paul Anstiss

'If you have a good and unique product that investors understand, then it's not difficult to get funding. What is important for investors is that you think big. That makes it interesting for them to invest' (Mark Borgman, Marketing Manager, Catawiki)

Catawiki

Catawiki is the number one online catalogue and auction house for special items and collectibles, and in 2015 was named as the fastest-growing company in Europe by Deloitte Technology Fast 500.

Founded in the Netherlands in 2008 as an online community for collectors, the site is now available in six languages. Since 2011, the company has been hosting over 160 weekly online auctions in categories such as vintage comic books, model trains, coins, stamps, watches, vinyl records, art, jewellery and classic cars. Bids are open for all to see, and winners pay their bid amount via a secure payment service to receive the object from the seller. The site makes its money by charging the buyer 9% and the seller 12.5% of the sale price.

Catawiki operates a network of over 100 auctioneers who value, authenticate and curate the objects. In addition to that, it employs 200 people and has offices in the Netherlands, UK, Italy, France, Germany, Spain and Belgium. The company has a total equity funding of around €85 million in three rounds from eight investors, and in July 2015 it received Series C funding of €73 million, which it says it will use for further expansion.

Amsterdam has become an international hub and attractive environment for those wanting to invest in the next big idea or provide traction for companies who are ready to develop further. The availability of investment capital has been stimulated by the Dutch Venture Initiative (DVI), an organisation that supports around 20 Dutch VC funds and enables managers with a particular focus on the Netherlands to tap into its €200-million reserve to provide further investments in innovative or high-tech early- and development-stage enterprises, in partnership with the European Investment Fund (EIF). Another such initiative is the European Angels Fund (EAF), which launched in September 2015. The aim of this €45 million fund is to enable business angels to increase their investment capacity, matching the angels' stakes, for a co-investment of between €250,000 and €5 million.

ANGELS IN RESIDENCE

The stagnant world economy has made investors reluctant to provide Series A-round funding, preferring to go for investment growth instead, which has made it difficult for start-up tech companies to obtain seed capital (usually €1-€3 million). However, things are starting to change, with initiatives such as INKEF Capital (Investing in the Knowledge Economy of the Future), a 15-year investment programme that has €200 million to allocate to Dutch and Canadian start-ups. Set up in 2010 by Dutch and Canadian pension-fund giants ABP and OMERS in a bid to reach out to this neglected seed area, Amsterdam-based INKEF Capital has now been joined by other investors such as Dutch bank ING.

INKEF Capital's 'Angels in Residence' programme recognises the value of co-investing, and encourages other investors to join its fund on a deal-by-deal basis. It focuses on two broad technology sectors: healthcare and ICT/new media/FinTech.

According to Managing Director Robert Jan Galema, 'the quality of Dutch ventures is very good', and the VC firm sees itself as more of a collaborator than an investor, preferring to contribute early and be a long-term partner.

SERIOUS INTERNATIONAL PLAYERS

One of the funds associated with the DVI is Amsterdam-based Endeit Capital, who launched its second fund of €125 million at the end of 2015. The VC form focuses on high-growth Internet companies with proven business models in digital media and marketing, EdTech, mobile, e-commerce and enterprise services. It typically invests €3-8 million in European companies that are ready to scale up, improve their market share and become serious international players.

Managing Partner and co-founder Hubert Deitmers knows the hard road to success all too well – entrepreneurship is in his blood. In 1994, Deitmers helped set up a small Dutch television production company called Endemol, which went on to became one of the world's biggest media companies.

Following the sale of Endemol in 2000, Deitmers and one of Endemol's founders, Joop van den Ende, launched Endeit Capital in 2006.

'We started the firm because we knew from experience that it was possible to build an international company from the Netherlands, and because we wanted to use that experience to help other entrepreneurs to expand,' Deitmers says. 'We are not just an investment company that provides money, we also want to be considered a serious partner.'

Endeit Capital invests in tech companies that only have a few partners (including the founder and two or three shareholders, max), and even though it takes a stake of around 30%, Deitmers says the firm is not financially driven. 'That's the main difference between us and other investors,' he continues. 'We don't think in terms of exits; our main focus is on helping entrepreneurs build their marketshare so that they are ready in time to either go public or to sell to a larger company.'

PAN-EUROPEAN APPROACH

Based in Amsterdam, Prime Ventures is another VC firm, one that manages €500 million in investments. Even though 50% of its investments are in the Dutch capital, the company takes a pan-European approach and wants to help new tech entrepreneurs develop a global presence through its international business networks. Acting as the lead investor with a financial interest of €5-€20 million in each project, Prime Ventures also provides significant follow-on funding through its partners and investors.

'Amsterdam really is an attractive city,' says founder and Managing Partner Sake Bosch. 'It is full of extraordinary entrepreneurs, and most of the successful start-ups are just a group of very ambitious people who have come here from all around the world. The reason they start here is that Amsterdam is a great place to live, and it also has a strong, developing ecosystem, of which we are a part. There is a community of angel investors, there are smaller seed funds, and much more too.'

Bosch cites one particular investment that, despite the lure of Silicon Valley, recently decided to move its headquarters back to Amsterdam. Takeaway.com, which started life in the Netherlands in 2000 as the online food-order site Thuisbezorgd.nl, became a phenomenal success, and in 2012, Prime Ventures invested €13 million to develop the concept further. It was followed two years later by another €73 million in a Series B-round led by Macquarie Capital and Prime Ventures two years later, and the company now operates worldwide, averaging 800,000 orders a month for its 20,000 member restaurants.

REFUSING TO CONFORM

HenQ, another Amsterdam-based VC firm, prides itself in being 'nonconformist' in both life and business. It boasts that it is the only Dutch VC firm that dares to invest in early-stage companies looking for seed investments from €100,000 upwards, and that it has the ability to continue

Wercker

Based in Amsterdam and with an office in San Francisco, Dutch company Wercker is at the forefront of a new technology known as 'Containerisation.' With the help of INKEF Capital, Wercker was able to raise Series A-round funding of US$4.5 million to enable the company to take the next step in its development. According to Wercker's founder and CEO, Micha Hernandez van Leuffen, the funding will be used to expand business development, improve marketing and build customer success.

Containers are seen as a real game changer in taking application development to a new level. The technology allows designers of apps to develop, build and launch their applications much faster. As a result, developers and IT professionals can deploy applications from a workstation to a server in a matter of seconds. A benefit that is particularly relevant as more businesses move to the Cloud.

Wercker's engineers and designers have previously worked on OpenStack, Google AppEngine, Simple, Digg and Disqus.

'We believe that a founding team should get as many brains on board as possible, as both advisors and investors' (Floris van Alkemade, Executive Partner henQ)

VEECEE

The VEECEE initiative was established in Amsterdam in October 2015 by a few young Dutch venture capitalists for European venture capitalists. The aim of the group is to ignite passion, share experiences, strengthen networks and make it easier for international VCs to connect to their peers. Events take place at least once every quarter and are by invitation only on a first come, first served basis.

The group holds masterclasses on topics such as how Dutch VCs can benefit from foreign VCs' industry knowledge and expertise in a particular region, and how they can learn from VCs in different sectors. The seminars allow Amsterdam's entrepreneurs and potential investors to expand their professional circle and 'hang out' with like-minded people over a drink or two.

Dedicated partners include ABN AMRO, PwC and Houthoff. VEECEE is live in Amsterdam and hopes to soon launch chapters in London and Berlin.

to invest up to €10 million in its winners. Executive Partner Floris van Alkemade says that henQ has a philosophy of cooperation and co-investment. 'We believe that a founding team should get as many brains on board as possible, as both advisors and investors,' he explains. 'Whenever we look at a company, we always ask what comes next. Will it be expansion to the UK? Or maybe Germany, the US or Asia? At that point, we look at who the next logical investor to join us could be. We believe that splitting is multiplying.'

HenQ recently launched a third fund of €50 million, aimed at young, ambitious and innovative companies of Dutch origin or with a Dutch link that are active in the fields of Internet, e-commerce, (mobile) media, analytics, Software as a Service (SaaS) and software development. Van Alkemade says that he and his co-investors look for companies that not only respond to global trends, but initiate them too. 'The question that we ask is: do they attract talent?' he explains. 'Are they such visionaries that the brightest engineers, designers and sales people really want to work with them? Because often, when you want to grow a company, it's all about access to good talent.'

Van Alkemade says henQ's sweet spot is business-to-business software. It looks for the moment when a company can show traction and a steady stream of regular customers, and it's particularly keen on service companies whose product is hosted somewhere in the Cloud, avoiding the need for expensive data centres.

LAY OF THE VC LAND

Founded in 2007, Peak Capital has three funds with a combined worth of €18 million, and it hopes to launch a fourth fund for Europe in the near future. According to entrepreneur and co-founder Johan van Mil, there is plenty of venture capital in the Netherlands, but start-up entrepreneurs often know very little about the investment ecosystem or the procedures to obtain funding. In a bid to help make the process more transparent and help entrepreneurs find the right match, Peak Capital recently published a map of the Netherlands tech VC landscape, which is updated each quarter and gives an overview of which seed-, growth- and later-stage VCs are active in the market. 'As a VC, we are very open as to what we are looking for,' explains van Mil. 'If you don't fit with us, then we will help you look for the right place and discuss which steps you need to take before you come to us.'

Peak Capital itself is interested in marketplaces, software, data, FinTech and HR tech companies that have found their product-market fit and are ready for growth capital to reach the next stage in their development. 'We're a very entrepreneurial VC, and we like to give hands-on support,' says van Mil. 'Just as when we became the first investor in Catawiki, Europe's fastest-growing company, we don't just look at the numbers; we help select the staff and partners, provide access to our network and think along with the entrepreneur as to how the growth of the company can be accelerated.'

According to van Mil, there has been a big shift in thinking over the past 10 years that encourages entrepreneurship. Big companies no longer promise a job for life and, as a result, don't have the same allure as they used to, which means that more people than ever before are striking out on their own. As Endeit Capital's Hubert Deitmers says, 'So much has happened in the online world already, but we're really only at the beginning. It's very exciting to be in a segment where we can play a part.' <

'Amsterdam is full of extraordinary entrepreneurs, and most of the successful start-ups are just a group of very ambitious people who have come here from all around the world' (Sake Bosch, founder and Managing Partner, Prime Ventures)

Amsterdam Capital Week

Amsterdam Capital Week is the first event of its kind to bring together start-ups and capital on a large scale, covering all levels.

It is the brainchild of Startup-Amsterdam, who initiated the first edition in 2015. This year, the event will be led by two female entrepreneurs, with StartupAmsterdam and numerous corporates as partners.

New tech start-ups from around the world travel to the (crowd-)Funding Capital of Europe to meet and pitch to more than 500 investors. It's an opportunity for more than 2,000 hackers, hipsters and hustlers to rub shoulders with potential backers.

The week is a showcase for Amsterdam's strong reputation as start-up capital, providing an abundance of pre-seed capital and access to international funding. It features unique events, during which angel investors, venture capitalists and crowd-funding events open their doors to start-ups as well as new tech companies ready to go to the next level.

Amsterdam Capital Week runs from 26-30 September 2016.

Follow Amsterdam Capital Week on Twitter to get all the latest updates (@CapitalWeekAMS).

clockwise from top:
photo: Frank Ruiter;
photo: John Lund/Getty Images;
photo: Adrian Woods

Start me up

It's been a little over a year since the first start-up visa was awarded in Amsterdam. Three start-up founders who have benefitted talk about their experiences in building their businesses and living in Amsterdam

text Jayne Robinson
photography Amke

The start-up visa scheme, which was implemented on 1 January 2015, was designed to bring great business ideas to the Netherlands. It makes it possible for ambitious international entrepreneurs to apply for a temporary residence permit on the grounds of their idea for an innovative product or service. They get one year (with the possibility to extend) to launch and grow their start-up, while being offered the support they need to develop it into a mature enterprise. This scenario is not only beneficial for the entrepreneur but also creates a solid foundation for job creation and economic growth in the Netherlands – after all, entrepreneurship remains one of the driving forces of the Dutch economy.

And if the budding entrepreneurs choose the Amsterdam Metropolitan Area as their base, they will work in what is widely seen as one of Europe's most exciting start-up scenes. Bolstered by a creative mindset, numerous initiatives that support new businesses and a high quality of life that attracts people from all over the world, the Amsterdam area's start-ups are thriving.

Finn Hansen

Co-founder of Biddy, a peer-to-peer video marketplace for clothing

The start-up visa certainly influenced my decision to set up my company in Amsterdam. It made it possible to access all the great things the local start-up community has to offer, such as numerous weekly meet-ups and pitching events, experts and co-working spaces. All these things helped me find co-founders, qualified feedback, advice and other networking opportunities I don't believe I would have gotten as easily elsewhere. Here, you have access to one of the leading European start-up ecosystems.

Amsterdam is one of the best places in Europe to start and grow your company due to the mindset of people in the community and the numerous start-up hubs. The local community pays it forward, just like in Silicon Valley. People are accessible, open to grab a coffee with you and tell you how they see it. If they can help, they will, or they will introduce you to someone who can. It's that feedback and sharing of experiences and knowledge that really makes the community valuable. The city is littered with start-up hubs like Rockstart; you walk in and are surrounded by dozens of high-potential start-ups. It makes you feel like you are in the right place.

Nothing beats the quality of life here. The cost of living is way cheaper than in most major European cities, you can cycle to work and the start-up community is very cosmopolitan and keeps it dynamic and diverse. I have made friends from all over the world, who all moved to Amsterdam to start their companies. It's a very soft landing when you arrive: 99% of people are fluent in English, and it's not unusual to conduct business in English.

My advice to a start-up founder applying for the visa would be to assemble a team with complementary skill sets and build a lo-fi prototype together, then apply to all the relevant accelerator programmes. If you get into one, the visa will follow. Immerse yourself in the start-up community and build a local network.
www.biddy.co


Finn Hansen, Co-founder of Biddy


Ajay Varadharajan, Founder and CEO of Green Insights

Ajay Varadharajan
Founder and CEO of Green Insights, a compny which supports businesses through their sustainability journey
As a sustainability consultant in the US, I was working in an environment where sustainability was viewed with scepticism. This made it difficult to innovate and push the boundaries of sustainability in business. As it's common knowledge that the Netherlands is one of the most progressive countries in the world and its capital is the Mecca of circular economy, Amsterdam was an obvious choice for me to get involved in the sustainability and circular-economy community and create new knowledge in this field. I started Green Insights with the goal of helping companies push their limits and extract new value through insights and innovative business models. So far, I haven't been disappointed.
The most important thing that the start-up visa has allowed us to do is to open up access to the European market. The one-year period helped in that it gave us time to experiment with our business model and tweak it to make it work best for us. The facilitator model is another great feature, as it offers coaching, opens up existing communities and gives valuable insights into European markets.
Amsterdam offers this unique blend of an active entrepreneurial community, government involvement and support, and a talent pool from the local universities. With a financially healthy customer base that is willing to try out new products and services and relative proximity to similar, bigger consumer markets like Germany and France, start-ups have a better chance of scaling successfully. In addition to all of that, Amsterdam is a great city to start a life: it is vibrant, tolerant, diverse…and a very fun place to live in.
I would definitely recommend the start-up visa for non-EU entrepreneurs that have identified a societal problem and want to test out their solution here in Europe. It is a great opportunity to have an impact, learn a lot in the process and live the good life.
www.greeninsights.org

Juan Pablo Jimenez Marroquin
CEO of eGEO, a Columbian hardware development start-up for smart-grid technology
We came all the way from Bogota to Amsterdam to enhance our knowledge and technology. Knowing the Netherlands' reputation for research, experience and innovation on smart cities and green energy, our team decided that Amsterdam had what we were looking for, and we were delighted to be one of 10 start-ups from around the world selected by the start-up accelerator Rockstart. Currently, we are part of their 2016 Smart Energy programme, which provides training and support. Being in Amsterdam allows us to test our technology, putting our initiatives into action and gathering valuable data in order to improve and grow.
Right now we are in the process of obtaining a start-up visa. As we are a Colombian company, this visa is extremely important in giving us the legal status and stability to develop our business. The visa simplifies the whole process and provides start-ups with the right tools to be able to focus more on the entrepreneurial part of the transition than on paperwork or complicated requirements.
Amsterdam is a very welcoming, open-minded city with a huge focus on innovation. There is a great feeling of hope for new technologies, business models and companies here. Within this community, it is very easy to exchange ideas and grow as a start-up.
www.egeo.co

For more about the start-up visa, visit the Expatcenter Amsterdam website at www.expatcenter.com
For all the latest news about start-ups in Amsterdam in general, visit www.startupamsterdam.org | #StartupAMS

photo: van der Torren Fotografie

Living in the new Amsterdam

Amsterdam is a small city with big dreams. Politicians, planners and builders are working together to prioritise three critical factors for urban balance: connectivity, liveability and trade. Overhoeks, Zuidas and Zoku are cases in point

text Paul Anstiss

'We don't want to have a city only for the rich or only for the tourists, or where you can only work and not live. We strive for balance in all of Amsterdam's 22 neighbourhoods' (Eric van der Burg, Alderman, City of Amsterdam)

Most Sustainable Business Park in Europe

Park 2020 – designed to stimulate creativity and help employees be more effective by providing a safe and healthy place for work and recreation – is the first project of its kind in the Netherlands. Situated near Schiphol Airport, it has become a showcase as the most sustainable business park in Europe.

Unique tailor-made buildings form a circle around a car-free public area. Plants, lighting and acoustics all contribute to creating a pleasant workplace. And when you need a break, green spaces, promenades and water features offer a tranquil retreat.

Buildings are designed with social and environmental features in mind, primarily using people and nature-friendly materials. Waste products are turned into energy to provide power.

Park 2020 includes 89,000 square metres of offices. Work places and recreational spaces are designed to encourage connectivity and provide places for people to meet and be inspired by one another.

Using what's known as a 'Cradle to Cradle' approach, when buildings have served their original purpose, they can be disassembled and used as 'material banks' to construct other work places.

Studies show that productivity at Park 2020 has increased by 5-10%, and that workers send 25% fewer emails.

Park 2020 is net to the A4 and has easy access to Schiphol Airport, the Port of Amsterdam, Utrecht and Rotterdam. Companies based at Park 2020 include Bosch, Siemens and Blue Water.

The renowned journalist Herb Caen once said that 'a city is not gauged by its length and width, but by the broadness of its vision and the height of its dreams'. Nothing could be truer of Amsterdam. At the core of the vision of this 'city village' of 800,000 inhabitants lies two themes: connectivity and liveability. These concepts provide the guiding light for politicians, planners, and builders in the key decisions they make about the future growth of Amsterdam.

According to Greg Clark, an 'urbanist' who advises on city and regional development around the globe, liveability underpins all successful cities: 'At its simplest, liveability is the thing that describes how attractive a city is as a place to live. A city that loses its liveability loses its most important asset – its people. And the ones it loses first are its mobile people, who tend to have the biggest choice and the most to contribute in terms of talent and skills.'

Clark stresses that connectivity, both internal and external, is equally critical if a city is to accommodate more people, activities, infrastructure and functions. Internal connectivity, or the ease with which someone can travel from home to their place of work, or from the airport to central business district, has become a major factor in where people choose to live. And external connectivity is about how easy it is for a city to connect to a national framework or, in the case of a global business, to connect to other hubs such as Paris, Brussels, London, New York and Hong Kong.

BALANCE IN THE CITY

Enabling growth while maintaining liveability and connectivity can be a bit of a balancing act, according to Eric van der Burg, the alderman responsible for Amsterdam's urban development. Keeping pace with demand for more housing and business facilities is no easy task: in 2015, Amsterdam built 8,500 new homes, the largest number in 35 years. But it's not just about building homes. It's about building a city: 'Our motto is "balance in the city", and that's what we are trying to create. We don't want to have a city only for the rich. We don't want to have a city only for the tourists. We don't want a city where you can only work and not live. We strive for balance in all of Amsterdam's 22 neighbourhoods.'

Today, in every part of Amsterdam, you will find major construction projects in progress. Whether it be innovative rental accommodation for students, buzzing network hubs for entrepreneurs, sustainable homes for families and singles, or swanky apartments for the rich and famous, Amsterdam and the wider metropolis are creating something for everyone. There's more to it than just bricks and mortar or building places for people to live, work or do business. It's about connecting the dots and giving people from all walks of life a stake in this vibrant and evolving town.

BLUEPRINT FOR GROWTH

The Director of Housing for the City of Amsterdam, Bob van der Zande, says it's an exciting time to live and work in the city. 'There are no bad parts in Amsterdam anymore. In addition to the waterfront projects, there are comprehensive plans for other parts of the city. Direction 2025 provides the spatial blueprint for the next ten years.'

This vision includes building 50,000 new houses for the centre of Amsterdam, along with 50,000 more in the greater metropolis. A mix of housing, schools, business and leisure facilities come together to complement each other and provide urban living for the 21st century.

clockwise from top:
rooftopbar at Ven Amsterdam;
Eric van der Burg, City of Amsterdam alderman (photo: Mark Horn);
Zoku

Fox vakanties at Park 20|20

According to the Director of Housing, 70% of Amsterdammers who are looking for a home want an urban lifestyle with all that it promises. 'We need to create a denser urban atmosphere to satisfy demand. Patterns of living are changing all the time, as is the use of the car. It means that we have to be more flexible in our planning and take into consideration the changing social and economic dynamics. What makes Amsterdam unique is that there's no segregation. There are people of all incomes living here.'

So how does Amsterdam score on connectivity and liveability? Let's take a look at a few of the hottest new developments around the city.

OVERHOEKS: REIMAGINING BOUNDARIES

Until recently, the A10 ring road defined the city's boundaries. Today those boundaries are being extended both in the imagination of its planners and in the broadening of its infrastructure. The new €3 billion North-South metro line is due to be completed in 2017 and will open up the area north of the city. Two new bridges connecting the north to the east and west are also planned, and the stretch of water known as the IJ will no longer be an insurmountable barrier, real or imagined, to interconnected growth.

Forward thinking is behind the development of Overhoeks, the area just across the IJ from Amsterdam's Central Station. What was once an industrial estate now boasts two of Amsterdam's newest icons: the EYE television and film museum and the A'DAM Tower, the completely renovated former Shell Tower, which now houses recording studios, restaurants and nightclubs.

New apartments with views over the water can be rented or bought at prices unimaginable to people in other European capital cities, according to real-estate broker and appraiser Marijn Kroes. Kroes says that, as more people wake up to the possibilities of living across the water, properties in north of Amsterdam are growing in value for the first time in years.' People are starting to look at Amsterdam North differently. Until recently, the neighbourhood might as well have been 40 km away. Homes there are up to 40% cheaper than in the centre of Amsterdam. And soon it will be only two stops away on the metro.'

ZUIDAS: THE EPITOME OF URBAN LIVING

One of the projects that best epitomises high-quality living, working and recreation in an urban setting can be found to the south of the city in Zuidas, also known as the 'Financial Mile.' It's hard not to be impressed with all the building that is taking place in this approximately 270 hectare (2.7 million m2) area. Although the project will not reach its full potential before 2040, accessibility, liveability and connectivity are clear defining features.

Zuidas is situated along the A10 ring road and between the Amstel and Schinkel rivers, and is served by rail and metro. Amsterdam Zuid is expected to become Amsterdam's second main station, with connections to Schiphol Airport (only 6 minutes away), Utrecht, Rotterdam, Antwerp, Paris and Brussels. The North-South metro line will also eventually terminate at Zuidas.

The area has already become a hotspot for international offices, with more than 700 companies, including Google, AkzoNobel and ABN AMRO, vested there. Soon it will become Amsterdam's second most prominent housing location, with nearly 600 housing units completed and another 8,000 to follow.

'People are starting to look at Amsterdam North differently. Soon it will be only two stops away on the metro, and homes there are up to 40% cheaper than in the centre of Amsterdam' (Marijn Kroes, Amsterdam real-estate broker)

Ven Amsterdam

Ven Amsterdam, in the Sloterdijk area of Amsterdam West, will provide a new world hub for networking, bringing new life and colour to a part of Amsterdam that is ripe for development.

The project is a perfect example of how connectivity and liveability come together to change the way that people do business.

Due to open in early 2017, it features a new Park Inn by Radisson Hotel, a convention centre, a spa and fitness area, cafes and restaurants, a casino and a rooftop bar.

Ven Amsterdam aims to cater to a new type of business traveller who wants to combine work and play while abroad, as well as locals looking for unique experiences.

At the core of the development is a large piazza ringed by curved mirrored walls.

120,000 hotel guests and 50,000 conference attendees are expected in the first year of opening.

The interior of the hotel has been styled by world-renowned designer Karim Rashid, who is famous for his use of vibrant colours.

The new complex is a one-minute walk from Sloterdijk train station, and just one stop away from both Central Station and Schiphol Airport. It's also served by the A10 and A5 motorways. And for those who fancy a bike ride through the beautiful Westerpark, the city centre is just ten minutes away.

Happy collisions at the Student Hotel

The Student Hotel, with branches in central Amsterdam and Amsterdam West, breaks the rulebook for hotel design and takes networking to a new level. Connectivity and liveability come together as a package.

The hotels are designed to stimulate connections between Millennials, students and young entrepreneurs.

Innovative, stylish, modern and open spaces offer the chance to enjoy what's been described as 'a happy collision'.

The ground floor is a giant eat-play-work-grow-meet creative workspace that aims to break down barriers in a 'boundary-blurring space'.

Here you can host a workshop, start a business, write a report or meet an investor over ping pong.

Rooms are comfortable and stylish and have superfast Wi-Fi. Netflix is also available.

Hotel rooms can be rented on a short-term basis or longer.

The 'Stay Awhile' package combines the service and convenience of a hotel with the comforts of home.

metro and trams are close by, and guests have access to VANMOOF bicycles to explore the city.

www.thestudenthotel.com

Tiny housing for a tiny price in Almere

The twenty-five lucky winners of a contest to design innovative and sustainable housing under 50 m2 in size will be offered the chance to build their own new homes in the city of Almere.

Homes are expected to cost €20,000-70,000.

The contest – called 'Liberated Living: Your Tiny House in Almere!' – was open to professionals, architects, builders, developers and non-professionals alike.

The aim was to encourage competitors to think out of the box and challenge conventional wisdom in creating homes for single or divorced people, or for those who simply want to downsize and reduce their ecological footprints.

The Tiny House movement originated in the United States and is slowly gaining ground in the Netherlands.

By producing sustainable homes at such a low price, owners can say goodbye to big mortgages and live comfortable lives with less stuff and no financial nooses around their necks.

Almere forms part of Amsterdam's greater metropolitan area, located just 26 kilometres to the east of the city. It is served by the A1 and A6 motorways, and is only 24 minutes by train to Amsterdam Central Station.

One third of Almere's population of almost 200,000 consists of single-person households.

The City of Almere has allocated land to the winning designs on both a permanent and semi-permanent basis. Land designated for future schools and other projects will provide temporary sites for up to two years.

www.bouwexpo-tinyhousing.nl

The Managing Director of Zuidas, Klaas de Boer, says its inclusiveness has seen Zuidas transformed into a well-rounded neighbourhood with all the amenities you need. There are both international and Dutch schools, cafés, restaurants and hotels. There are sports centres and a growing number of retail outlets, from convenience stores to gift shops. Rental apartments range from €600-1200 a month, and those for sale average around €4,000 per square metre.

You can feel the buzz, according to de Boer. 'When you go out to Zuidplein at lunchtime, you see that it's an area with young people who work hard and play hard. There's a lot of testosterone. The mixture of offices, apartments catering to everyone's budget, the students from VU – they all give it a thrilling youthful vibe. It's very much Amsterdam, but with a twist of its own.'

ZOKU: PART OF THE TRIBE

For those not looking to purchase or rent property on a long-term basis, there are plenty of other opportunities to experience liveability and connectivity in the 'city-village' of Amsterdam. Zoku creates a new category in the hotel industry that provides global living and working for the travelling professional. It is one of several innovative projects that are being developed in Amsterdam to provide accommodation on the go. Situated in the Metropole building near Amsterdam's Waterlooplein and canal district, Zoku Loft provides starting at 25 m2 that are equipped with not only a bed but a small kitchen and a meeting area where you can easily conduct business or interviews.

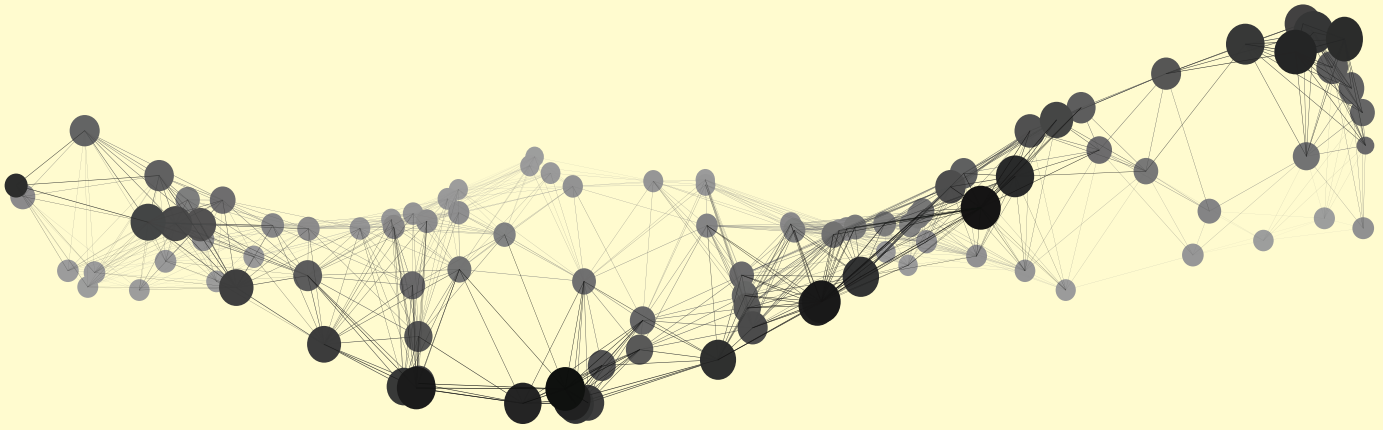
You can even personalise your loft space with a selection of art available to hang on the walls. According to co-founder Marc Jongerius, Zoku caters to a younger generation of entrepreneurs with nomadic lifestyles who are comfortable mixing business with pleasure.

'Zoku represents the end of the hotel as we know it. Whereas traditional hotels are about putting heads in beds, Zoku combines all the services of a hotel with the social buzz of a thriving *neighbourhood.* Here you can live, work and relax with like-minded people while getting wired into the city.'

The project was crowdfunded, and spaces were designed and evaluated with the help of 300 human-resource experts and business people from around the world. Prices vary according to the length of stay. Co-founder Hans Meyer says liveability and connectivity are very much part of the Zoku ideal: 'Zoku is the perfect springboard to set up your business or a local office in Amsterdam. Our community managers can connect you to local social and business networks.'

Amsterdam already has a global reputation as an open and diverse place with a rich history, vibrant culture and strong identity. Despite its relatively small size in global terms, it retains the ability to punch above its weight. But in order to attract and retain decision makers, investors, skilled innovators and entrepreneurs, the city is re-defining what it means to live and work in a city fit for the 21st century. Liveability and connectivity are key to its success. <

The Fabric of Science



Amsterdam's close-knit scientific community makes creating crossovers between science and business easy. In this special edition of AMS dedicated to the knowledge industry, we highlight five key areas of science and innovation in the Amsterdam region.

The knowledge ecosystem

The Amsterdam Metropolitan Area is making its name as a scientific and knowledge leader thanks to creative and strategic collaborations in fields ranging from health and horticulture to Big Data and nanotechnology.

foreword **Rijk van Ark**, *Director of the Department of Economic Affairs*

In April 2016, the European Commission awarded Amsterdam with the iCapital award, declaring Amsterdam the European Capital of Innovation for the following two years. For us at Economic Affairs, the award is an official acknowledgment of the fact that Amsterdam is well known worldwide for being a creative, innovative and international business hotspot that serves as a gateway to Europe.

But the city, and its greater metropolitan area, has another lesser-known strength: it is also one of the top knowledge cities in Europe. Surely Amsterdam is home to a thriving ecosystem of innovation that creates jobs, attracts talent and feeds entrepreneurship. But what makes this city unique is that this ecosystem is powered by a close collaboration between world-leading universities, scientific and corporate research institutes and the many local science-based entrepreneurs and innovators. Thousands of people work on innovations and technologies here, with the aim of helping to solve modern-day challenges.

Amsterdam as urban lab

Building on its scientific strengths, Amsterdam has an asset that is hard to emulate elsewhere: it is an ideal testbed for new technologies and innovative ideas. The Amsterdam area makes a great living laboratory due to its compact size, extremely diverse population (Amsterdam residents have 180 different nationalities) and many ground-breaking spaces for collaboration. The innovation process is guided by a set of principles. These include openness, pragmatism, agility and embracing diversity. These are principles that all stakeholders – from researchers and scientists to businesses and the City of Amsterdam – work together to realise. With innovation in the city's DNA, Amsterdam is flexible and creative in how it deals with the challenges it faces. Researchers, scientists and the City of Amsterdam all work together to find innovative solutions for these challenges. Amsterdam is the perfect place to employ scientific experimentation to build on our knowledge and generate new ideas for the market place. Our region is increasingly able to translate science-based solutions into practice, and to do so quickly, thanks to the outstanding infrastructure that the city provides to its start-ups and spin-offs.

The city also benefits from its proximity to other major Dutch knowledge cities, such as Rotterdam, Delft, Eindhoven, Utrecht, Leiden and Wageningen – all of which can be reached from Amsterdam within 90 minutes of travel time. The combined research enterprise of the larger Randstad area is formidable, rivalling that of the world's largest metropolises, such as


photo: Kasia Gatowska


photo: Vincent Boon


photo: Gregor Servais

clockwise from top left:
Student Hotel;
cancer research;
Amsterdam Green Campus;
children playing at the beach;
Solardam


photo: Vincent Boon


photo: Amaury Miller/Hollandse Hoogte

London or Tokyo.
According to a 2015 study by Elsevier and the Urban Innovation Network of 11 European cities, called 'Mapping Research and Innovation: Understanding Amsterdam's Competitive Advantage', Amsterdam's per capita research output is second only to Copenhagen, and the relative impact of its research is the highest. This enables Amsterdam to attract both young knowledge workers who want to live in a highly educated, collegial city and companies that are seeking to employ that talent.

Amsterdam's most exciting science
This AMS Knowledge Special highlights some of the Amsterdam Metropolitan Area's indisputable scientific strengths. It looks at Amsterdam's contributions in information technology and computer science, life sciences and health, as well as nanoscience and (other) green sciences. The final section in this Knowledge Special illustrates several ways in which the city functions as an urban laboratory by singling out initiatives such as Amsterdam Smart City, the Amsterdam Institute for Metropolitan Solutions (the other AMS), the Knowledge Mile and Amsterdam Water Science.
Highlighting some of Amsterdam's greatest assets in knowledge, science and innovation illustrates why Amsterdam has become a prime destination for companies seeking to test their innovations as well as do scientific research. For research institutions and knowledge-intensive companies wishing to build upon those strengths, Amsterdam's scientific and knowledge community welcomes all opportunities to leverage these assets through co-operations and partnerships with stakeholders in Amsterdam, the rest of the Netherlands and abroad. <

Out of 11 cities studied, Amsterdam's per capita research output is second only to Copenhagen, and the relative impact of its research is the highest

Interview with Patricia Lago

Keeping Big Data from getting too big

According to Professor Patricia Lago, head of the Software and Services research group at the Vrije University Amsterdam (VU), sustainability must be at the heart of the Big Data revolution if it is to be viable in the future. But sadly, it's not easy trying to persuade a sceptical industry that now is the time to address this pressing need, before it becomes an even bigger problem.

text **Paul Anstiss** photography **Peter Gerritsen**

As traditional databases have become swamped by all the data being produced, more companies than ever before are joining the inexorable migration to the Cloud for their storage needs. However, this comes with a cost. Lago points out that, not only does the data sector consume a great deal of energy to keep systems cool and regulate humidity, it has a large capacity that is currently not being utilised efficiently. Currently, it's estimated that the sector consumes 10% of the world's electricity, and within 20 years it is expected to become the main consumer.

Lago's research is concerned with software- and service-oriented architecture, architectural knowledge management, and green IT. She and her team see themselves very much as pioneers in an industry that is only just beginning to wake up to the possibilities of Big Data. At the VU, Lago and her team are building new energy- and sustainability-aware software architecture that allows data storage systems to 'sip' energy instead of guzzle it.

'The impact of this migration to the Cloud is huge, and the business world doesn't always appreciate what's involved,' says Lago. 'It tends to focus on privacy and security issues because we understand these better, but we also need to consider the availability and reliability of these systems, not only for safety-critical services in case of disaster, but also for the services we use in our daily lives, such as banking.'

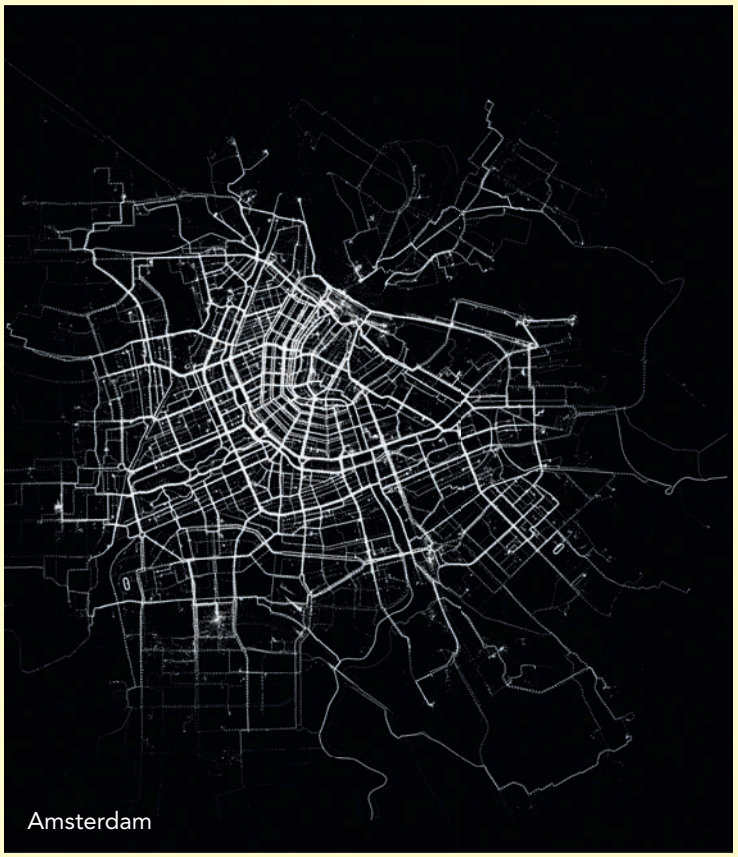
Amsterdam hub

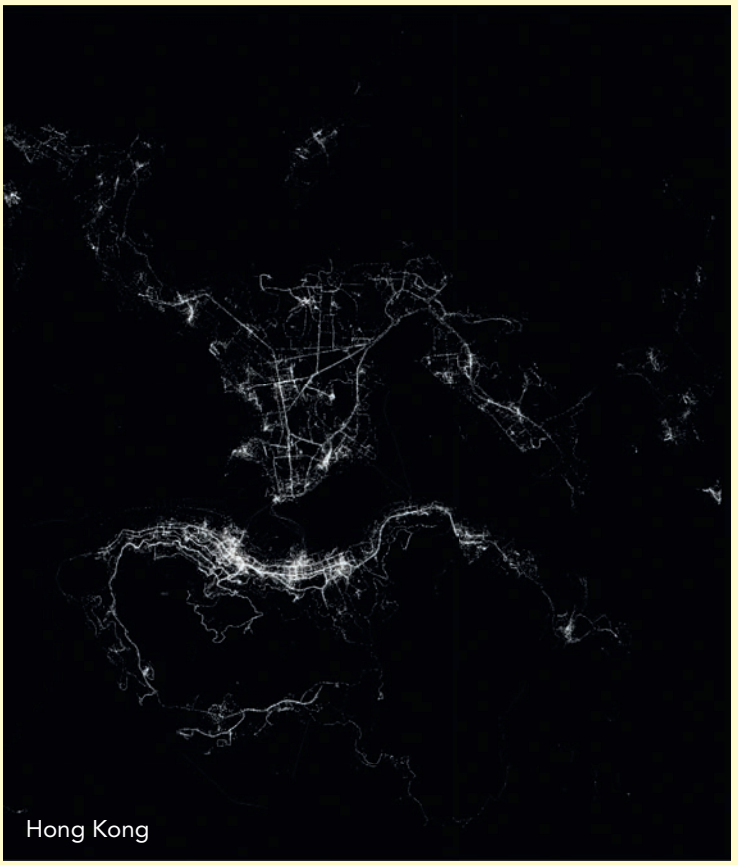
It is no coincidence that Lago and her team find themselves at the forefront of this brave new world. Amsterdam has become the digital gateway for all Internet traffic arriving in Europe from the US, and one third of all of Europe's data centres are located here. The region's cool climate and flat landscape make it the ideal environment, and in the Amsterdam Randstad area, there are 180 'data hotels' covering more than 240,000 m2. Lago describes it as a cascading effect that's seen companies such as IBM, EMC and Google look to the Netherlands for their data-storage needs. 'Maturity in information and communications technology design, together with a government strategy that actively invests in key sectors, has put the Netherlands ahead of other countries in this industry, despite it being so small.'

Green lab

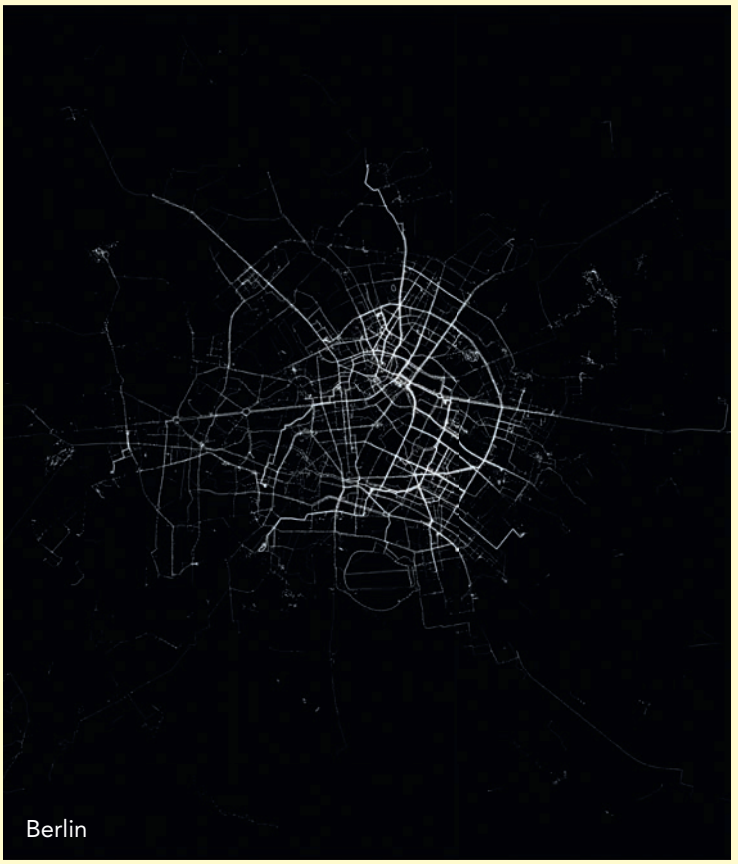
Lago says companies often decide to outsource their data management for economic reasons without actually thinking about the long-term costs, but she says it's a necessary consideration when designing the architecture of a new system. Not only should a data storage system be green, it also needs to be profitable and designed for change. According to Lago, the first thing to establish is what data should

Professor Patricia Lago





Real-time cycling activity on 9 May 2016 in four cities



App developers at Human created maps envisaging the routes its users took to walk, run or bicycle through several cities. Using Amazon Web Services and a GPS tool, they plotted the movements of each user during a 24-hour period. Cities were ranked on the basis of activity. Unsurprisingly, Amsterdam topped the list in 'bicycling activity'. www.human.co

Interview with Patricia Lago

remain in the company and what should migrate to the Cloud.
At VU's Green Lab, Lago and her team are helping design a Cloud model optimised for company needs. Collaboration with the world of industry is seen as the key to success. The lab hosts a number of servers with state-of-the-art energy sensors, to run experiments on software energy efficiency. The aim of the research is to focus on the real needs of industrial practice. Researchers look for the 'software footprint' that makes software smart as well as sustainable; they measure, for example, energy consumption and try to find new ways to optimise behaviour.
'We focus on the energy efficiency of the systems themselves, which means we can lessen the amount of data stored and decrease duplications,' says Lago. 'We need to decrease the number of servers managing data that no one uses and look more broadly at how software systems managing processes like transportation, logistics and mobility can be organised in a more sustainable way. This has a direct impact on the amount of servers involved and the amount of electricity that they use.'

Smarter systems, greater optimisation
The VU is world renowned for its creativity in software engineering. In particular, it focuses on architectural tactics that make software systems smarter and provide a better quality of service. Furthermore, the team of researchers is looking at ways of turning the disadvantages of a system into advantages. For example, in several quarters in Amsterdam, the heat generated from data storage is used to heat residential areas. In fact, Amsterdam's City Hall was among the first to use the heat created from its data storage unit to grow tomatoes in its own greenhouse next door. Although cooling is less of a problem than it was, the size of storage centres continues to grow. For Lago, the most important challenge is optimisation.
'In recent decades, we have been developing software without any attention to optimisation, simply because hardware has become so cheap and efficient that no one worries. Systems have grown in size and store a lot of data that no one uses. But I believe that quality of service and flexibility will become a key differentiating factor in the future.'

The key to success
Lago is confident that her work at the VU remains at the forefront of developments in Big Data, but she does admit that it's been hard to convince the busines world to provide the necessary funding for research. As Lago sees it, innovation is the key to the success of the Big Data revolution, and the ability to accurately predict how much data-storage capacity is needed will determine the future direction of this exciting new industry. But she warns that many data centres, which currently use only 20-80% of their storage capacity, are not in a position to make the predictions they need to put things into context. According to Lago, this overcapacity is expensive and the potential for decreasing the safety buffer is immense. For Big Data to succeed in the future, the problem must be tackled now.
'Unfortunately, there is currently no incentive for companies to invest in better predictive technology, but in a few years they will have to. Those companies that invest now will find that they are ahead when it comes to providing data-storage and software services that require less energy and offer greater flexibility.'
Lago's predictions are a wake-up call to the data-storage and software industry: don't let Big Data get bigger than your business. <

In the Amsterdam Randstad area, there are 180 'data hotels' covering more than 240,000 m2

Currently, it's estimated that the data sector consumes 10% of the world's electricity, and within 20 years it is expected to become the main consumer

Professor Arnold Smeulders

Seeing through machines' eyes

A new computer vision lab in the Amsterdam Science Park shows the fruitful results of collaborations between Amsterdam's university and industry.

text **Douglas Heingartner** photography **Gregor Servais**

In June of 2015, the University of Amsterdam (UvA) and the American tech giant Qualcomm unveiled their new public-private partnership: a joint research lab known as QUVA. Based in the Amsterdam Science Park, the new lab is dedicated to machine-learning techniques, and is a further extension of academic research in the field.

The mission of the QUVA lab is to merge computer vision with machine learning, which will make it even easier to automatically interpret images and videos. Qualcomm, which ships more than one billion processors per year, will then use this new knowledge in improving the visual capabilities of mobile devices such as smartphones.

Computer visionary

Arnold Smeulders, a professor of computer vision at the UvA and part of the new research lab's management team, has been working in the field since its earliest days in the 1970s. He says that, for the first 30 years, he had quite a bit of trouble getting people to understand why computer vision was important: 'They would say, "But humans can already see what it is. Why do you need a computer to tell you what it is?"' But today, the applications of computer vison are plain to see, in everything from cameras and robots, to driverless vehicles and quality assessments. 'Now it's more like the other way around: Give me a test for which vision does not play a part,' says Smeulders. And at the QUVA lab, they will carry out research into or generating automatic video summaries, or recognising an object in an image from just a single example.

Driven by big data

The recent ascent of the computer-vision field has less to do with computing power than it does with the availability of more and more data.

When he started in the 1970s, Smeulders says, 'They didn't have all this data.' But around the year 2000, all of the sensors started becoming digital, all of the images were being stored and many images were exchanged online. 'From that point on, you see a huge accumulation of digital data. Think of a thousand pictures from a billion people who each have a smartphone; that's already a trillion images,' he says. As a result, the quality of image recognition 'has taken off rapidly, exponentially, so that it now has real practical implications everywhere'.

Smeulders and his 'fellow travellers' in the field of vision research have been taking part in competitions for years to judge which algorithms are the best at automatically labelling images. In the early days, their algorithms performed poorly, only slightly better than chance, which at the time was often good enough to win. But about three years ago, computer vison have progressed to the point 'where there are maybe 30,000 categories of images that can be identified with reasonable success, about 20,000 of these as well as humans can,' Smeulders explains. In some fine-grained categories, computers can even do better than typical humans, for example in distinguishing between a Kentucky warbler and an ordinary warbler. In this sense, image recognition is now 'something that they can check off the list'.

Machine learning

‘The quality of image recognition has taken off rapidly, exponentially, so that it now has real practical implications everywhere’ (Arnold Smeulders, Professor of Computer Vision at the UvA)

Deep vision

The QUVA lab will be combining research from the fields of computer vision and machine learning to advance the knowledge of deep vision. This combination has many potential uses, for example in facial recognition, motion sensing or the analysis of security footage. On the vision side, the computer looks for the most meaningful features of sample images and videos, while machine learning handles the pattern recognition and learning functions. When competitions in the early 2000s tested the latest recognition algorithms, even the winners performed at levels only slightly better than chance. But now there are thousands of categories where computers can automatically identify objects as well as humans can, and in some cases even better (like when it comes to identifying specific bird species). The mission of the QUVA lab is to enhance such capabilities even further, for example by figuring out how to recognise objects in an image from only a single example.

How computers see the world

Computer vision works differently than human vision, in that what might be important to humans in recognising or describing an image, such as someone’s eyes, can form a relatively small and unimportant part of the image as the computer sees it. The computer also uses different strategies: when looking for a table knife, for example, it’s easier to search for a table fork (a much less common shape), as there is a great likelihood that a knife will be next to it.

Smeulders is currently researching how computers are getting better at recognising even abstract concepts, which he had initially believed would be unlikely. In the early days, he thought that, at most, 15% of our words could have a visual equivalent that a computer could recognise. ‘But I don’t think that’s true anymore,’ he says. ‘Even words such as ‘democracy’ have a visual symbol in people’s heads. That’s a very abstract word, but it is still recognisable if you have enough examples.

‘A word like “yellow” is based on reality, whereas a word like “happy” is more abstract,’ continues Smeulders. ‘But if you gave a happy-looking image to a thousand people, the greater majority of them would probably use the word “happy” to describe it.’

The trick is to identify what is visually present in all of the images in a certain category. ‘If the human and the computer both reach the same name after looking at a certain group of images, then somehow people must be must seeing what is invariably common to all of them.’

Academic foundations

QUVA marks the second such joint lab initiative, the first being the Advanced Research Center for Nanolithography (ARCNL), which was formed in 2013 by the chip-maker ASML and several Amsterdam universities and institutes.

This new collaboration between the UvA and Qualcomm speaks to ‘the long-standing tradition of research into the capabilities of computer vision,’ says Smeulders. The QUVA-lab, which will form part of the UvA’s Informatics Institute, came about in September 2014 after Qualcomm had acquired Euvision, a UvA spin-off company that Smeulders had co-founded. The ensuing talks between UvA and Qualcomm about a possible research collaboration ultimately resulted in QUVA, which will employ between 15 and 20 researchers.

‘The fact that Qualcomm came here to start a laboratory after the acquisition of Euvision tells you that it is in their interests,’ says Smeulders, ‘otherwise they wouldn’t do it.’ And it was the UvA’s role as a university in general that initially provided the foundations for a company like Euvision to develop in the first place. Independent research of that kind, says Smeulders, is ‘where the unexpected and the unforeseen and the unplanned directions are more likely to come from.’ <

Professor Arnold Smeulders

Quantum software

Software's quantum leap forward

At QuSoft, the Netherlands' first research centre devoted to quantum software, the main focus is on the development of software that will take advantage of the massive power offered by tomorrow's quantum computers.

text **Douglas Heingartner** photography **Gregor Servais**

Quantum computing marks a new chapter in computer history, as it allows almost infinitely more calculations to be performed than with the digital computers we have today. But so far, most of the investments in the field have gone into quantum hardware, leaving great opportunities in developing the software that will make these powerful machines useful.

Software is the main research focus of QuSoft – a joint initiative of the Vrije Universiteit Amsterdam (VU), the University of Amsterdam (UvA) and the Center for Mathematics and Computer Science (CWI), which opened in the Amsterdam Science Park last December. The research centre will collaborate closely with QuTech, an allied research institute in Delft that focuses on the quantum hardware itself.

Faster, more powerful computing

QuSoft is the brainchild of Harry Buhrman, a group leader at CWI and professor of computer science at the UvA. He likens the current situation to the 1960s, when there was much new computer hardware was developed, but no one really knew what to do with it.

'People had no clue what we could do with the computer,' says Buhrman, who estimates that powerful quantum computers will start becoming available in five to fifteen years' time. 'You need the hardware, but the software enables us to use it. So it's just as important, if not even more so.'

Quantum computing is based on the idea from physics that the smallest particles, for example electrons, can be in two different states at the same time. So, instead of a bit being either a 1 or a 0, the so-called qubits that form the basic unit of quantum computing are both a 1 and a 0 at the same time (which is also known as superposition). QuSoft can currently work with about nine or 10 stable qubits, which is impressive from a scientific perspective, though not so much in terms of computing power. But Buhrman's prognosis is that it will 'maybe be another five years' before 10 qubits will have grown to 50 qubits, and it's then that things become more interesting.

'With 50 qubits, you can have 2^{50} possible superpositions at once, and that is not so easy to simulate,' he says. 'In that instance, you really do need supercomputers, and maybe those won't even be good enough. Certainly with 70 qubits, we go through the roof of what we can do now. And herein lies the power of quantum computing: massive computing potential, with more calculations than you ever dreamt of.' (As soon as we can master that new, counterintuitive quantum software, that is.)

Safeguarding the future

Another focus at QuSoft is developing new forms of cryptography. Much of today's cryptography – for example the type that underlies secure online transactions – will, according to Buhrman, 'be easy to crack when the first working quantum computers arrive.'

Harry Buhrman, group leader at CWI and Professor of Computer Science at the UvA

Much of today's cryptography – for example the type that underlies secure online transactions – will be easy to crack when the first working quantum computers arrive

He goes on to explain, 'Quantum computing will destroy quite a lot of the encryption that is vital for our society to run. Not only for buying goods online, but also for military applications or diplomatic communications. A lot of this cryptography is broken when you have a quantum computer.'
So it's important, says Buhrman, to start developing cryptographic applications now that will be able to withstand those new computers, which will be able to retroactively decrypt messages that were secured using the old methods.

Quantum Amsterdam
When deciding upon its location, it made perfect sense to choose Amsterdam as the base for QuSoft. Quantum computing requires collaboration between various disciplines, something that Amsterdam excels at.
The city also has a long history of quantum research. 'We started working on quantum computing very early on. It's not so easy to get into; you need to know about computer science, physics and quantum mechanics. And there aren't a lot of people who are trained to do all those things. But since we, in Amsterdam, have worked on this topic for many years, we do have a lot of highly trained people.'
The new centre builds on the excellent reputation of the participating Amsterdam institutions, and also strengthens the position of the Netherlands as a centre of world-class quantum computing. According to Buhrman, 'QuSoft is in one sense very academic, because we carry out academic research to develop quantum algorithms,' but there are also obvious benefits for industry and corporations. Though it's not yet exactly clear what those will be, Buhrman does say, 'everyone somehow feels intuitively that the benefits will be great. If what we do can eventually lead to something very useful and applicable, then that's terrific.' <

Quantum computing, in short
The basic building block of quantum computing is the qubit. Unlike a traditional computer bit, which is either a 1 or a 0, a qubit is in both of those states at the same time, and can do two calculations instead of one. Assuming we can master programming using interference and entanglement, calculation power increases exponentially: two qubits can perform four calculations, three qubits nine, and so on. And that explains the allure of quantum computing: with enough qubits, you can do an extremely high number of calculations at the same time. Today, the QuSoft team and others can work with about 10 qubits, which isn't even as powerful as a cheap wristwatch. But that number is increasing quickly: QuSoft predicts that, within about five years, quantum computers will have reached 50 qubits. That would make them powerful enough to compete with supercomputers, and 70 qubits would exceed the capabilities of even the most powerful machines of today.

Inspiring new developments in science.

text **Douglas Heingartner**

1
Stryker
stryker.com/nl

2
Amsterdam ArenA
amsterdamarena.nl/en

3
Tata Steel
tatasteel.com
amsterdamsciencepark.nl

4 6
VUmc
vumc.com

5
Confocal.nl
confocal.nl

6
Lameris Ootech
ootech.nl

7
Caelus Health
caelushealth.com

1

Stryker opens European headquarters in Amsterdam

The Stryker Corporation, an American medical technology company based in Michigan, has opened its European headquarters in Amsterdam. Stryker has chosen the Amsterdam area as a strategic location to strengthen its overall presence in Europe. Stryker's products include surgical equipment, implants and other devices used in a variety of medical specialties.

photo: Co de Kruijf/Hollandse Hoogte

2

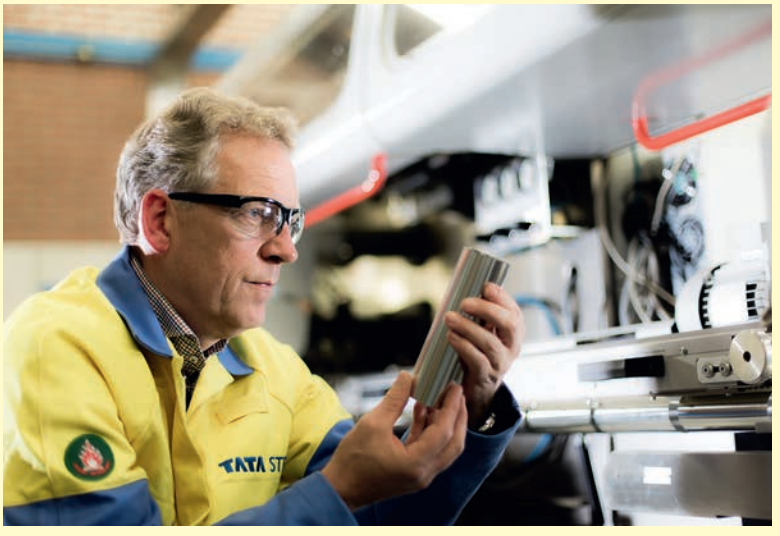
The ArenA stadium invites ideas for renovation

The Amsterdam ArenA, the largest stadium in the Netherlands, is inviting creative thinkers and innovative entrepreneurs to contribute their ideas for the stadium of the future. The best plans will be tested and implemented in the new ArenA, which is undergoing a large-scale renovation in 2016. The City of Amsterdam and Amsterdam Smart City will be collaborating with innovation partners including Microsoft, Huawei, KPN, KPMG and TNO. Example projects include new ways of shortening queues, reducing waste and connecting visitors and fans online.

3

Making better deal with digital technology

Tata Steel has opened a new office at the Amsterdam Science Park. Researchers from Tata will cooperate with innovative start-ups to develop new techniques using the latest digital innovations. One project is a cooperation with the artificial intelligence startup Scyfer, a spin-off of the University of Amsterdam. Together, Tata and Scyfer will use deep-learning technology to improve the steel inspection process. Tata is the latest multinational to take advantage of the many talents available at Amsterdam Science Park. In 2013, chip-maker ASML established a nanolithography institute here, and the American tech giant Qualcomm recently opened its new QUVA lab.



4

High-tech health at VUmc Tracer Center Amsterdam

To meet the growing demand for cooperation between companies and scientists in the field of imaging, the VUmc is building the Tracer Center Amsterdam, where they will collaborate in a laboratory environment. This new high-tech facility for advanced biomedical research and drug development is expected to open in 2019. The centre will strengthen Amsterdam's leading position as a European knowledge centre in this field, and will also contribute to the health of people around the world.

5

Start-up introduces innovative microscope

This summer, a University of Amsterdam startup called Confocal.nl will begin marketing the first-ever confocal microscope with a plug-and-play feature. The microscope offers super-resolution imaging, which provides an even sharper focus on living cells. In a confocal microscope, also known as a laser-scanning microscope, a laser beam is used to scan successive layers of a specimen, resulting in images that are stored digitally in 3D form. The resolution of the company's new version is higher than that of today's confocal microscopes, and it will be marketed as an affordable, customised alternative. The new microscope uses a patented technology developed at the UvA's Swammerdam Institute for Life Sciences, with funding from the Dutch technology foundation STW.

6

VUmc and Lameris Ootech help improve vision

Clinicians and technicians at the Vrije University Medical Center have been working together to develop a new eye-tracking technology. It uses intelligent software to determine exactly how and where a person's eyes are looking, which leads to greater accuracy in the measurement of strabismus (squint) in children. Lameris-Ootech, a supplier of ophthalmic products, has acquired a license for the device and expects it to be launched commercially by the end of 2016.

photo: Edwin Janssen/Hollandse Hoogte

7

AMC company Caelus Health fights diabetes

The biotech company Caelus Health, a spin-off of the AMC medical centre and Wageningen University, develops innovative products to delay the onset of diabetes. Their products use microorganisms found in the human gut to improve sensitivity to insulin, which helps people reduce their chances of developing diabetes. The mixture is consumed as a frozen drink every day for a month. With the help of Danish company Chr. Hansen, it is also being turned into a freeze-dried powder for easier consumption and longer storage at room temperature.

Professor Tom Würdinger, VUmc Cancer Center Amsterdam

Cancer research

Advancing oncology treatment faster in Amsterdam

Amsterdam, a globally recognised hub of cancer expertise for over a century, has devised some impressive ways to translate knowledge from the lab to bedside care as quickly as possible.

text **Jayne Robinson and Ed Aanhane** photography **Vincent Boon**

Amsterdam's entrepreneurial spirit is woven into its very essence; the city continually moves to the forefront of various fields with its new and innovative ways of thinking. And it's this evolutionary attitude that makes the city a worthy match for an equally agile and ever-adapting field of research: oncology, the study and treatment of cancer.

Since the unravelling of the human gene sequence in 2003, huge leaps have been made in the field of human genetics. Cancer research has naturally evolved alongside these advances, and the approach to therapy has shifted from broad, one-size-fits-all treatments to personalised ones tailored to the individual. Although radiation, surgery and chemotherapies are still widely used today, the insight that no two tumours are alike has led to a greater focus on tailored medicines that offer high efficacy, new methods of early detection and, ideally, reduced side effects. At the heart of this new wave of cancer research are the laboratories of Amsterdam, home to some of the world's leading experts and a hotbed for game-changing new developments in the field.

With a population of just under 800,000 – that's one tenth the size of London or New York – the city of Amsterdam is relatively small in comparison to its global peers. But its size is a factor that works to the city's favour in many ways, gifting it an agility and responsiveness that helps things to move quickly. Additionally, Amsterdam is known for its close-knit, collaborative communities that work together to achieve great things. Nowhere is this approach more evident – and more valuable – than within Amsterdam's biomedical circle: a thriving network of institutions and companies built on sturdy foundations, fuelled by new ideas, and supported by strong initiatives that make for one of the most effective cancer research hubs on the planet.

A research hive

With many established oncological research institutes calling Amsterdam home, the city has been a globally recognised hub of cancer expertise for over a century. The Netherlands Cancer Institute, the Vrije University Medical Center Cancer Center Amsterdam (VUmc CCA) and the Oncologic Research Centre AMC (ORCA, part of the Academic Medical Center) are all located in Amsterdam, employing a combined workforce of nearly 9,000 people, and producing around 4,000 scientific articles every year.

To preserve and promote knowledge for future generations to build on and to ensure that Amsterdam continues to drive the field of oncology forward, these three institutions have united to create the Oncology Graduate School Amsterdam (Onderzoekschool Oncologie Amsterdam, or OOA). The OOA employs around 500 PhD students and produces over 1,900 scientific papers each year. It plays an active role in Amsterdam's oncological community, organising regular events and meetups to promote the exchange of knowledge and hone the expertise of its students.

But to optimise and share the information generated at these research institutes and to ensure that their findings can impact real lives, it is important that knowledge be translated from the lab bench to the bedside as quickly as possible. Amsterdam has devised some impressive ways to achieve this.

Bringing science and business together

Nothing fosters a sense of community like close physical proximity. So two science parks were created, to promote the integration of oncological research from Amsterdam's major and minor institutions into the developments of the companies that can best utilise it. The Amsterdam Science Park and the Medical Business Park offer companies high-tech business premises amongst the scientific institutes and faculties, removing geographical obstacles to their effective collaboration. The parks equip businesses with all the latest facilities, as well as a fibre optic network to connect everyone and promote quick data analysis.

The Innovation Exchange Amsterdam (IXA) acts as the go-between for Amsterdam-

Cancer research

'The Netherlands truly has an outstanding schooling system. It means we can train great people' (Dr. Tom Würdinger, VUmc Cancer Center Amsterdam)

based academic institutions and parties interested in their research findings: for example, companies, educational institutions, investors, healthcare providers and government bodies. Researchers require assistance from companies when it comes to increasing the social and economic footprint of their scientific work, while companies need help in finding business opportunities or tailor-made solutions for problems. It's a relationship that benefits all, so the IXA was established with the overall goal of providing societal impact from science. A conglomeration of the various Technology Transfer Offices (TTOs) of five Amsterdam institutes, the IXA brings together their accumulated knowledge and drives the transition of scientific discoveries into groundbreaking insights that can benefit society in a number of ways.

One vivid example of the benefits of this integrated approach is the newly established Hartwig Medical Foundation tumour DNA database. This non-profit organisation, which opened its doors in the Amsterdam Science Park in February 2016, uses the latest sequencers to track the individual characteristics of the tumours of all cancer patients in the Netherlands. Combined with the patients' clinical data, the organisation strives to promote new cancer treatments and to refine current strategies. Having direct access to this kind of facility is undoubtedly invaluable for hospitals, research institutes and companies alike.

Another recent success story of this collaborative approach is thromboDx, the molecular diagnostics company established in 2012 to house Dr. Tom Würdinger's groundbreaking neuro-oncology research at the VUmc CCA (and recently acquired by San Diego-based sequencing company Illumina). Facilitated by the IXA, Dr. Würdinger and his team – in collaboration with laboratories from Umeå University in Sweden, Harvard Medical School and Massachusetts General Hospital in Boston – developed a blood-based diagnostics platform that is able to identify the location of the primary tumour and guide therapeutic decision making. They discovered that platelets in our blood can be ideal cancer biomarkers, carrying a tumour's genetic information, thus enabling doctors to detect tumours by means of a blood test, with no need for a biopsy.

Würdinger now works for a number of institutions, from the VUmc and Harvard Medical School to Illumina start-up GRAIL, where, as Director of Nucleic Acid Biology, he is working on a global cancer blood test. In addition to the (financial) support of VUmc's neurosurgery department, led by Professor Peter Vandertop, and the VUmc Liquid Biopsy Center Amsterdam (since 2016, the first Dutch blood bank for cancer research), Dr. Würdinger cites the IXA, and in particular the Technology Transfer Office of the VUmc, as key factors in facilitating the transfer of thromboDx from the lab to a commercial venture.

'The TTO from the VU was crucial,' he enthuses. 'They assisted the inventors in getting the appropriate patents, they helped us to put the initial business case together, and they supported us with funds and access to their network.'

A personal approach

Another recent shift in the development of personalised cancer treatments with its roots firmly planted in Amsterdam laboratories is immunotherapy – i.e., treatments that harness the power of the immune system to fight cancer. Immunology has been in the international headlines recently, with scientists confident that it could form the backbone of new cancer treatments in the coming years.

Just as every person's genetic makeup is completely unique, so is every tumour. While two people can be diagnosed with the same type of cancer, the genetic backgrounds of their tumours are likely to be very different. That's why eminent researcher Dr. Ton Schumacher and his cancer immunology research groups at the Netherlands Cancer Institute in Amsterdam (in collaboration with groups from the TUM School of Medicine and Stage Cell Therapeutics, both from Germany) have been working hard in the

VUmc Cancer Center Amsterdam, in short...

The VUmc Cancer Center Amsterdam is part of the Vrije University Medical Center, its clear-cut mission to prevent and cure cancer and immunological diseases and to increase survival rates. As a national and international leader in cancer research, the focus in 2016 is on early diagnostics and personalised treatment, driven by research into onco-genesis, immunopathogenesis, disease pro-filing, innovative therapy, quality of life, etc. The VUmc has established an official code with the Academic Medical Center (AMC), bridging Amsterdam's two university medical centres and promoting more collaborative research projects.

The institute aims to reach talent as early as possible, reaching out to children still in secondary school. They can continue on to bachelor's programmes in medicine, biomedical sciences and health and life sciences, and eventually two-year master's programmes in oncology and biomedical sciences. At any given moment, the VUmc CCA is home to more than 200 PhD students.

Researchers at work in the VUmc Cancer Center

Cancer research

Amsterdam is known for its close-knit, collaborative communities that work together to achieve great things

Tom Würdinger
A home-grown talent, Tom Würdinger received his MSc degree at the VU in 2001 before going on to earn his PhD from the Virology division of Utrecht University in collaboration with the Gene Therapy division of the VUmc, for which he received the Greiner Award from the Dutch Society of Gene Therapy. He then moved to Boston, in the US, to start his post-doc period as a research fellow at Massachusetts General Hospital and Harvard Medical School under the guidance of Dr. X.O. Breakefield and Dr. R. Weissleder. Currently, he has a permanent tenured position as an associate professor at the VUmc and the Cancer Center Amsterdam. Furthermore, he holds a research fellowship at Massachusetts General Hospital and Harvard Medical School. He is the co-founder and CSO of molecular diagnostics company thromboDx BV, which was sold to pharma company Illumina in early 2016.

field of T-Cell receptor therapy to help develop tailor-made treatments that weaponise the body's own immune system to effectively fight cancer.
This type of therapy helps the immune system to destroy harmful cancer cells by cloning the patient's own T-cells (which already have the ability to eradicate diseased cells), swelling their numbers in a lab, and reintroducing them back into the body to fight the cancer. However, T-cell therapy currently involves a process that can be difficult and time consuming (the custom isolation and characterisation of tumour-specific T-cells from each patient), and doesn't always yield high-avidity T-cells. And when a patient needs treatment right away, designing a personal vaccine is impractical.
Through his work at the Dutch Cancer Institute, Professor Schumacher has found a way to overcome the hurdles that were preventing T-cell therapy from becoming an efficient and commercially viable treatment. His solution is to generate a high-throughput platform that speeds up the process of isolating tumour-specific T-cell receptors and selecting the ones with the highest efficacy.
The T-Cell Factory (TCF) was established in 2014 to house the patents and intellectual property of the platform. Seeing the far-reaching therapeutic and commercial possibilities of the project, biopharmaceutical company Kite Pharma acquired TCF in 2015 for an upfront payment of €21 million and additional milestone achievement-linked bonuses that could well surpass the €250 million mark.
As Dr. Tanja de Gruil, who specialises in translational tumour immunology at the VUmc Cancer Center points out, 'high-profile multimillion-dollar deals like the takeovers of the T-Cell Factory and thromboDx demonstrate how the infrastructure in these Amsterdam research institutes supports the entire gamut of translational research, from lab bench to bedside.'

Tomorrow's talent today

Of course, it should never be forgotten that all of Amsterdam's big-hitters in cancer research, whether they're gracing the cover of New Scientist or dealing with commercial offers from the world's top pharma brands, are continuously giving back to the city's academic circles via professorships and expert guidance. Undoubtedly, one of the true strengths of Amsterdam isn't just the research organisations and initiatives already in play, but the talent continuously feeding into the system of graduate research.
These days, the University of Amsterdam and the VU are working hand in hand to strengthen scientific education throughout the region under the banner 'Science in Amsterdam', a targeted campaign that reaches out to potential students at home and abroad looking to delve into bachelor's or master's programmes.
And for those students who have a keen sense of what they want to achieve from the outset, the VUmc CCA provides a 'lifelong learning' programme that reaches out to scientific talents at secondary schools, guiding them towards (bio)medical bachelor programmes, research masters in oncology and onwards into the doctorates and postdoctoral roles of the previously mentioned Oncology Graduate School Amsterdam.
As someone who is not only heavily involved in Amsterdam's cancer-research scene but also in teaching the next generation, Dr. Würdinger is not surprisingly proud of the efforts currently in place to attract potential students and prepare them for clinical and academic roles at leading institutions around the world. 'The Netherlands truly has an outstanding schooling system, as compared to most, if not all, other countries. It means we can train great people,' he says. 'And when you also consider that we have the largest university hospital here and the ongoing integration taking place between the AMC and VUmc, the other cancer-focused research institutes and now the Dutch Cancer Society right here in Amsterdam, it's no surprise that the city is enjoying so much success when it comes to breakthroughs in cancer research. <

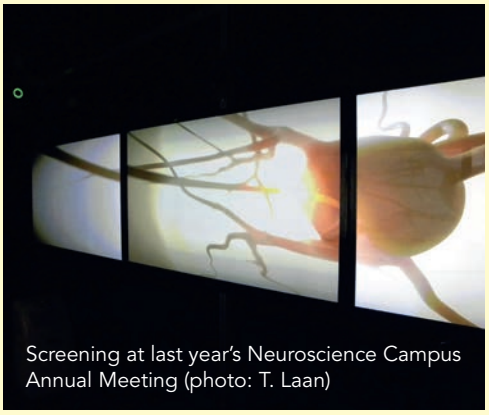
Neuroscience

‘Hard science, done well’

The current trend in Amsterdam is collaboration – from public-private partnerships to research alliances – and Neuroscience Campus Amsterdam provides a shining example. This new research organisation brings together the city’s top hospitals and universities to focus on all aspects of the healthy and diseased human brain.

text **Lauren Comiteau**

The Vrije Universiteit (VU), its University Medical Center (VUmc), the Academic Medical Center (AMC) and the University of Amsterdam (UvA) have joined forces to bring about breakthroughs in the area of neuroscience. Researchers hope that by studying how the brain functions they will also learn how it malfunctions, allowing early diagnosis and prevention of related disorders.
‘Our main aim is to improve understanding of the human brain and nervous system in both health and disease,’ says Arjen Brussaard, the scientific director of Neuroscience Campus Amsterdam. ‘Understanding healthy function aids development of the wide variety of innovations needed in order to eventually apply these to neurological, neuroimmunological and neuropsychiatric disorders.’
‘Neuroscience is one of the scientific fields of expertise that Amsterdam excels in,’ says Didier Manjoero, programme manager in the city’s Knowledge and Innovation Department. ‘We do hard science here and we do it well. Amsterdam is a scientific hotspot.’
In fact, a recent study by Elsevier Analytical Services concurred that Amsterdam ranks highly in the area of medicine: among the 11 cities under comparison, Amsterdam ranked second and first, respectively, in relative volume and impact of medical research. Specifically, Amsterdam’s relative research impact in clinical neurology is more than 2.5 times the world average.



Screening at last year’s Neuroscience Campus Annual Meeting (photo: T. Laan)

Neuroscience has simultaneously become a high-profile research area and a knowledge industry. Indeed, Neuroscience Campus Amsterdam is amongst the largest neuroscience research communities in Europe. The alliance will study the brain, nervous-system functioning and disease mechanisms through an integrative approach from ‘molecule to bedside and vice versa’.

Healthy alliances

With 850 staff in the Amsterdam area and more than 1,200 papers published each year, Neuroscience Campus Amsterdam will host nine research programmes, covering for example brain imaging; mood, anxiety and psychosis; and brain mechanisms.

Another programme will focus on neurodegenerative disorders, which include some of the century’s biggest health care challenges: Alzheimer’s and other forms of dementia and Parkinson’s disease. There are more than 250,000 people suffering from dementia in the Netherlands alone, and another 40,000 with Parkinson’s.
As the population ages, these numbers are expected to rise, putting a huge strain on the country’s healthcare system. ‘This poses a direct threat to the sustainability of our entire healthcare system,’ say the planners within Neuroscience Campus Amsterdam. ‘The development of treatments that stop, prevent or at least slow down degenerative processes is crucial to reduce future costs associated with neurodegenerative disorders, and to keep our healthcare system viable.’
Neuroscience Campus Amsterdam has also forged business relations with external stakeholders, and gives clinical guidance for intervention trials and research programmes in collaboration with the busines sector New technologies and collaborations with, among others, the Amsterdam Dementia Cohort (about 5,000 people) and another group for Parkinson’s will all play a role.
To date, treatment for these disorders is limited to the alleviation of symptoms, but Neuroscience Campus Amsterdam hopes that they can prevent full-blown cases by detecting the diseases before they manifest. <

Interview with Jaap Seidell & Arnoud Verhoeff

The quest for healthier children

The new, cross-disciplinary Sarphati Amsterdam project makes local children the focus of cutting-edge research on lifestyle-related diseases, predominantly obesity. AMS sat down with the head of the program, epidemiologist Arnoud Verhoeff, and its research leader Jaap Seidell, professor of nutrition and health, to find out what Amsterdam might be able to teach the rest of the world.

text **Lauren Comiteau** photography **Mark Horn**

Epidemics are not what they used to be. Certainly, communicable diseases from Ebola to tuberculosis still flourish. But the biggest global threats to health these days are NCDs – non-communicable diseases. Just because they're not immediately life threatening doesn't mean that they pose any less danger in the long term: NCDs are currently the world's top killers. In short, lifestyle-related diseases – such as diabetes, heart and lung disease, cancers and obesity – are prevalent in the cities that are increasingly home to the majority of the world's population.

Enter Sarphati Amsterdam, a new research initiative, initially devoted to all things obesity-related, to be launched this year. By pooling together the best minds in scientific research, the government and the private sector, Sarphati Amsterdam – named after the 19th-century Amsterdam doctor and city planner Samuel Sarphati – aims to promote healthy lifestyles and find out where we've gone so wrong in the past.

Amsterdam is no stranger to cutting edge research: its GGD (Gemeentelijke Gezondheidsdienst), the municipal health service that oversees the well-being of all children until the age of 18, is world renowned for its work. Sarphati Amsterdam will make use of the GGD's built-in study group of all of the city's children, and will work with research institutions including the University of Amsterdam (UvA), the Academic Medical Center (AMC), the Vrije University and its Medical Center (VUmc) and the Amsterdam University of Applied Sciences (HvA). With this collaborative effort to study obesity, Sarphati Amsterdam clearly has high ambitions.

You changed the name from Sarphati Institute to Sarphati Amsterdam in the run up to the launch. Why?
Arnoud: We realised that the word 'institute' implies a big distance from people on the street. We would like to contribute to the health of Amsterdam's population for the sake of its citizens: they have a stake in this project too. The Sarphati community will be interactive, enabling people to communicate with each other and with professionals.

So what is Sarphati Amsterdam all about?
Arnoud: We will focus on new epidemics, one of which is obesity, at the local level. Although research is being done on these epidemics, it is not integrated. We will do innovative research within a network of disciplines.

Jaap: Amsterdam provides a unique structure for our research. Children are followed by the GGD, with the help of their schools, from birth until they are 18 years old. Additionally, Amsterdam has a long-term goal to promote healthy lifestyles. So we have the policy, the infrastructure and the expertise to bring it all together.

Is this what you mean by the 'Triple Helix' model?
Jaap: Yes: researchers, government and

Professors Jaap Seidell and Arnoud Verhoeff

Children playing at a Cruyff Court (photo: David Rozing/Hollandse Hoogte)

Interview with Jaap Seidell & Arnoud Verhoeff

private partners will be working together. We're lining up all types of collaborators. To promote healthier lifestyles for children, we need to create partnerships with caterers, retailers and IT partners who can, for example, make apps for smartphones.

I recently attended a UNICEF meeting in New York. The growth of healthy children is a major global issue. Although no one has found a solution yet, we know it must be multi-dimensional. We need an integrated approach, given the current changes in the areas of food and the environment. Amsterdam has the ambition to excel in science and public health, and can provide this integration. And not only Amsterdammers will benefit, but global citizens as well.

The indigenous Dutch are notoriously tall and svelte, but there are many different ethnic groups in the city. How does that factor into your research?
Arnoud: Diversity is the nature of Amsterdam, which makes the group we study very unique.

Jaap: The problem differs in different ethnic groups. Children from Turkish or Surinamese backgrounds are more often overweight. So we are looking into why: is it culture, class, the neighbourhood? Different communities also have different body perceptions and ideals. We're looking into this from different disciplines.

Tell me more about these so-called 'new' epidemics.
Jaap: Global non-communicable diseases are all lifestyle-related, and linked to social and economic differences. 80% of the population in low- and middle-income countries suffers from these diseases. They also threaten economies. Although [UN Secretary General] Ban Ki-moon has developed a prevention plan, no one has found a solution yet.

It's a global challenge: half of the world's population currently resides in urban areas. In the coming years, that number will reach 75%. Our question is how cities, stakeholders and citizens can contribute to solving the problem.
We are not starting from scratch: the city, universities and the GGD have been working together for a long time. A grant from the city has now made it possible to create the infrastructure to cement it all together.

Are there similar models in other parts of the world?
Leeds in England has a similar program. In Amsterdam, 10,000 babies are born annually and they are all included in the study. Our research includes 150,000-160,000 children and young adults, which makes it dynamic and enables intervention studies [to test hypotheses about the determinants of the diseases].

What can we expect in 2016?
Jaap: Our first research meeting in March on the promotion of healthy growth and lifestyles brought together more than 30 researchers from different disciplines – ethnographers, pediatricians, anthropologists and microbiologists.
Our initial research is into microbiomes: the correlation of certain bacteria in the body with obesity and weight loss, and ethnography. For example, we want to learn more about how parents and care providers from different cultural backgrounds raise their children with respect to food. There are many overweight children with a high BMI (body mass index). We are focusing on lifestyle and the creation of a healthy environment, which is good for both mental and physical growth. <

'Amsterdam provides a unique structure for research. Children are followed by the GGD from their birth until they are 18 years old' (Jaap Seidell, Sarphati Amsterdam)

A close knit community

The clusters of research-focused buildings that comprise the Amsterdam Metropolitan Area's knowledge institutions are just a short distance from each other in this tightly packed city. Furthermore, the small country of the Netherlands boasts at least seven other major research institutions within 90 minutes of travel from the capital.

NKI 0 410
The Netherlands Cancer Institute (NKI), including its 180-bed Antoni van Leeuwenhoek Hospital, is the only dedicated cancer centre in The Netherlands and plays an important role as a national and international centre of scientific and clinical expertise, development and training.
Research area: Human health (biochemistry, cell biology, oncology, immunology, radiotherapy).

Sanquin 75 180
Sanquin Research deals with a complementary range of subjects, including fundamental biology and biochemistry of blood cells and plasma proteins, hematopoiesis, immunohematology, coagulation, immunopathology, bloodborne infections, blood transfusion technology, transfusion monitoring, transfusion medicine and donor studies.

NLR 27 128
The National Aerospace Laboratory (NLR) is the Netherlands' independent aerospace knowledge enterprise. Its overall mission is making air transport and space exploration safer, more sustainable and more efficient through a multidisciplinary approach.
Research area: New and cost-effective technologies for aviation and space, from design support to production technology and Maintenance, Repair and Overhaul (MRO)

NIKHEF 42 200
NIKHEF is the Dutch National Institute for Subatomic Physics and part of the Netherlands Organisation for Scientific Research (NWO).
Research area: The interactions and structure of all elementary particles and fields at the smallest distance scale and the highest attainable energy.

ARCNL 7 47
The Advanced Research Center for Nanolithography (ARCNL) is a public-private partnership between ASML, FOM, NWO, UvA and VU, formally started in 2014. ARCNL employs about 60 ambitious researchers from all over the world and intends to grow into a centre of expertise consisting of 90 researchers.

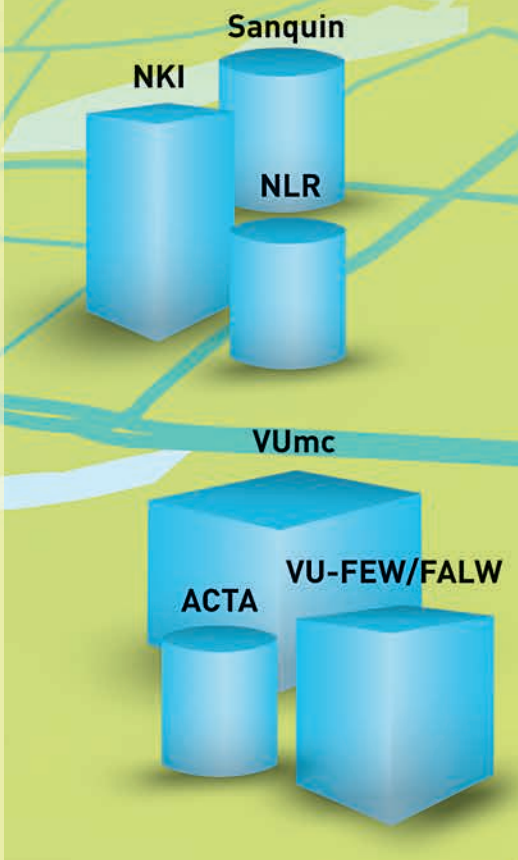
ACTA 836 356
The Academic Centre for Dentistry Amsterdam (ACTA) is a joint institute of the University of Amsterdam and VU University Amsterdam.
Research area: the physiology and pathology of the tissues in and around the oral cavity, including infectious diseases such as caries and periodontitis.

AMOLF 34 97
FOM Institute AMOLF is one of the research laboratories of the Foundation for Fundamental Research on Matter (FOM), part of the Netherlands Organisation for Scientific Research (NWO). Its mission is to research complex molecular and materials systems.

VUmc 2627 2247
The Vrije University Medical Centre Amsterdam (VUmc) is part of the VU Amsterdam campus. With over 700 beds and a staff of nearly 7,000, VUmc also houses the VU's Faculty of Medicine.
Research area: Human health & life sciences, focusing on five themes: cancer & immunology, neurosciences, cardiovascular disease, public health, primary care & long-term care and human movement sciences."

NIN 50 124
The Netherlands Institute for Neurosciences (NIN) focuses on how networks of neurons enable the cognitive functions of the brain, including consciousness, perception, movement, learning and social interaction, in health and disease.
Research areas: NIN addresses three levels of biological complexity: genetic and molecular approaches, cellular approaches and network functioning, and system and behavioural approaches.

Surfsara 41 29
SURFsara provides a complete package of services in the fields of high-performance computing (HPC), networking, data services, visualisation, e-science support and cloud services. They work with the academic community (including researchers, educational institutions and academic medical centres), industry and SMEs.



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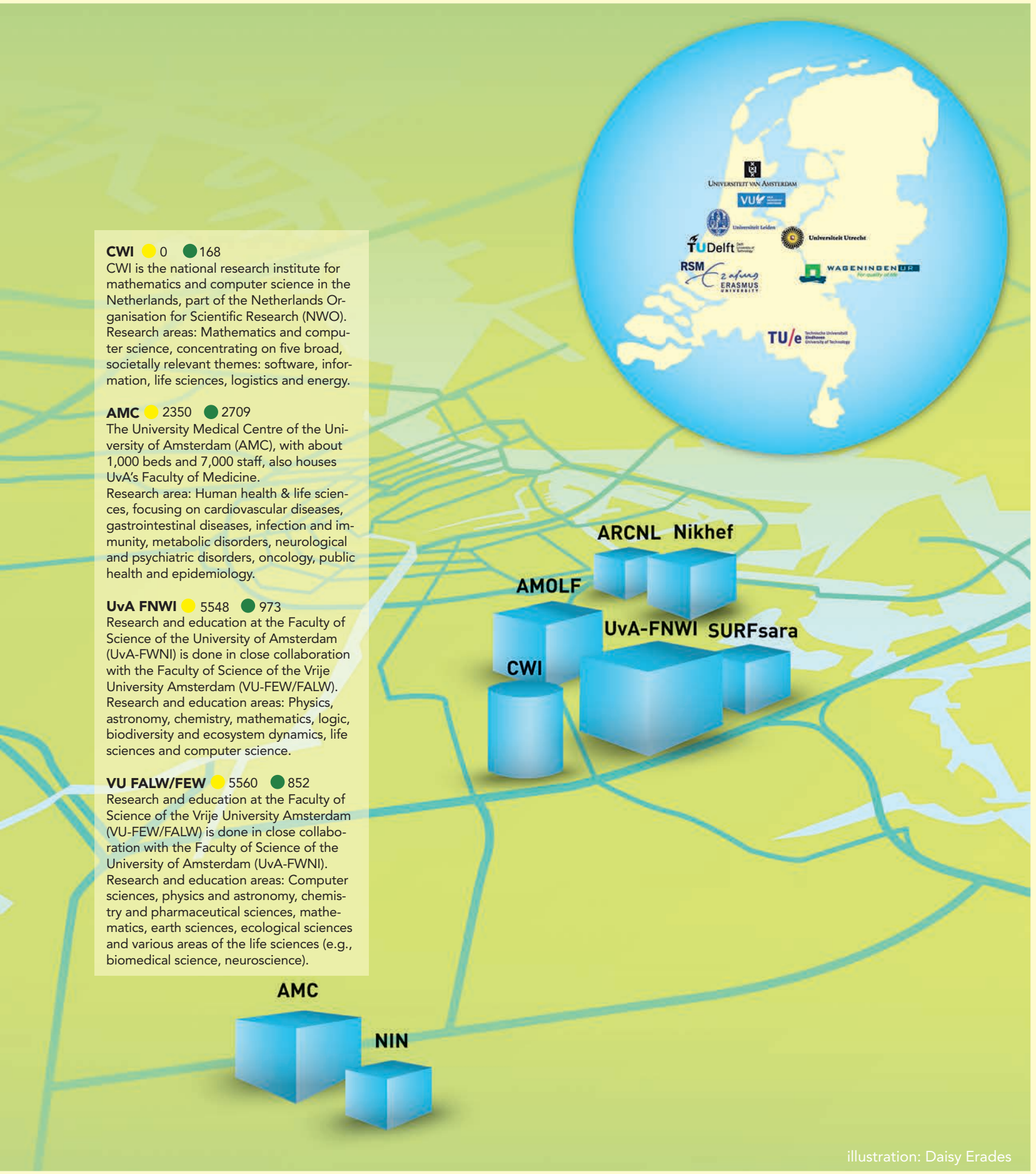


CWI 0 168
CWI is the national research institute for mathematics and computer science in the Netherlands, part of the Netherlands Organisation for Scientific Research (NWO).
Research areas: Mathematics and computer science, concentrating on five broad, societally relevant themes: software, information, life sciences, logistics and energy.

AMC 2350 2709
The University Medical Centre of the University of Amsterdam (AMC), with about 1,000 beds and 7,000 staff, also houses UvA's Faculty of Medicine.
Research area: Human health & life sciences, focusing on cardiovascular diseases, gastrointestinal diseases, infection and immunity, metabolic disorders, neurological and psychiatric disorders, oncology, public health and epidemiology.

UvA FNWI 5548 973
Research and education at the Faculty of Science of the University of Amsterdam (UvA-FWNI) is done in close collaboration with the Faculty of Science of the Vrije University Amsterdam (VU-FEW/FALW).
Research and education areas: Physics, astronomy, chemistry, mathematics, logic, biodiversity and ecosystem dynamics, life sciences and computer science.

VU FALW/FEW 5560 852
Research and education at the Faculty of Science of the Vrije University Amsterdam (VU-FEW/FALW) is done in close collaboration with the Faculty of Science of the University of Amsterdam (UvA-FWNI).
Research and education areas: Computer sciences, physics and astronomy, chemistry and pharmaceutical sciences, mathematics, earth sciences, ecological sciences and various areas of the life sciences (e.g., biomedical science, neuroscience).

illustration: Daisy Erades

Professor Albert Polman

Interview with Albert Polman

‘Digging canals, a million times smaller’

Little by little, Professor Albert Polman is changing the world. He has dedicated his life to the technology of small things: the world of nanoscience. With a particular focus on the area of photovoltaics and the application of nanoscience to solar energy, Polman’s work has the possibility of making a real impact on our day-to-day lives.

text **Jayne Robinson and Ed Aanhane** photography **Vincent Boon**

Nanotechnology is an inescapable part of our everyday lives: so small that it often goes unnoticed. We encounter nanotechnology regularly: it’s in the clothes we wear and the gadgets we use. But nanotechnology is more than just neat inventions. It has the power to impact the world in very meaningful ways – for example, by reducing fuel emissions, cleaning up our energy sources and contributing to the future health of the planet. Innovations in nanotech are often inspired by the natural world, which has had a 4.5-billion-year head start when it comes to the manipulation of materials at the smallest scale.

The charismatic Professor Albert Polman is something of a celebrity in his field: he previously headed the Foundation for Fundamental Research on Matter’s AMOLF research laboratory in Amsterdam Science Park, and currently leads a scientific group on nanophotonics there. ‘There is a whole world of materials and structures at the nano scale,’ explains Polman in his bright office at the high-tech AMOLF institute. ‘We ourselves are entirely made up from nanotechnology. Our cells, veins, nerves: it’s all at the nanoscale. So nano, in that sense, is nothing new. But what is new is that now we can make nano ourselves. It’s completely opened up a new world.’

Alongside Japan and the USA, the Netherlands ranks in the top three nations for nanotechnology research and innovation. The driving force behind this excellence is a healthy ecosystem created by collaboration between the government, universities, research institutes and hundreds of companies. But as Polman is quick to point out, ‘In the end it’s still down to the people. And why do people come here? Well, that’s because it’s Amsterdam. It’s the city itself.’

Polman has taken an active lead in one of the collaborations that has blossomed in Amsterdam’s supportive ecosystem: Solardam, the city’s network of solar collaborators. With the aim of more efficiently harnessing the power of the sun to create ‘fuel’ using nanotechnology, one percentage point at a time.

‘In this field, every percent counts,’ he explains. ‘The whole solar industry is worth €100 billion per year, and that’s based on our current panels with only 20% efficiency. So if I can make 20% into 21%, that’s worth an extra €5 billion per year.’

Increasing the efficiency of solar panels is one of Solardam’s main goals. ‘It will slowly increase,’ he explains. ‘But not by itself. You have to make inventions that improve the technology: new materials and new nanostructures. That’s what our research is for.’

Polman’s belief in the power of solar to transform the planet’s energy use is unwavering, but he’s realistic that for solar to become a viable alternative it must become cheaper than other energy sources. ‘The next century is going to be the solar century,’ he asserts. ‘I’m convinced it’s going to happen. Not necessarily because I like the environment better than the next

‘We ourselves are entirely made up of nanotechnology. Our cells, veins, nerves: it’s all at the nanoscale. So nano, in that sense, is nothing new’ (Professor Albert Polman, FOM Institute AMOLF)

Interview with Albert Polman

‘The next century is going to be the solar century. Solar will simply become cheaper than everything else, and everyone will switch’ (Professor Albert Polman)

Nano, in short

- Nanotechnology is technology that operates on the nanoscale, about one billionth of a metre.
- A nanometre is one millionth of a millimetre. To put nanoscience in perspective, a human hair is 75,000 nanometres. If one metre were to be blown up to the size of the earth, then a nanometre would be the size of a marble.
- The idea of nanotechnology dates back to 1959, when famous physicist Richard Feynman suggested we could manipulate individual atoms and use them to build tiny machines. However, the term ‘nanotechnology’ was not coined until the 1980s.
- Nanomaterials are already present in more than 1,000 consumer products, from cosmetics to cars. In 1995, the first nanomedicine was approved for cancer treatment; since then researchers have continued to find new applications for nanotechnology to combat diseases.

person, but because of economics. Solar will simply become cheaper than everything else, and everyone will switch. But for that to happen, we first have to make solar fuels more efficiently.’

Nanolithography breaking ground

Another Amsterdam-based initiative that’s helping to drive the nanotechnology industry forward in crucial ways is the Advanced Research Center for Nanolithography, or ARCNL. Forged out of a collaboration between four prominent partners in the Netherlands and Germany, ARCNL focuses on the fundamental physics involved in current and future key technologies in nanolithography. And, as with most things nano in Amsterdam, Polman initiated the group’s ground-breaking work. ARCNL was created in response to a brief set by the Dutch semiconductor-equioment manufacturer ASML, which reached out to the scientific community for help in solving one of the fundamental challenges of nanoscience: how to create the tools needed to ensure long-term innovation in the field.

Four different organisations bid for the prestigious partnership, and the ARCNL proposal ultimately triumphed. Polman is quick to praise the city of Amsterdam for its support in the process: ‘Amsterdam has been very welcoming to ARCNL,’ he says. ‘They provided the subsidy to help start the institute. I’d been to City Hall to talk about how to attract ARCNL to Amsterdam, to make sure that it ended up here and not somewhere else. You see the city really wants to help. ‘Its support of ARCNL isn’t the only way in which Polman believes the municipality has been integral to the continued growth of Amsterdam’s scientific community. ‘Amsterdam has discovered the science campus,’ he proclaims. ‘Five years ago, this place was out in the fields and nobody knew about it. Now there are 10,000 people here, thanks to the university and the institutes and also to the efforts of the City of Amsterdam.’

Amsterdam’s Science Park, which houses the AMOLF institute where Polman and his team are based, is often cited as a major factor in inspiring the collaboration that drives innovation in Amsterdam’s scientific community.

‘Science is based on connections between people,’ says Polman. ‘There are more than 130 companies based at Science Park, and we’re all interacting with each other. With the cooperation of the other organisations named here, we are trying to attract new companies to Science Park, and we know that we have something special to offer them.’

Whether it’s research taking place within AMOLF, ARCNL or Solardam, there is a palpable confidence enveloping the city’s nanotech community today. And it’s clear that Amsterdam’s collaborative and innovative nature has influenced the cutting-edge nanoscience research carried out here. ‘In the 16th century we were experts at digging canals in Amsterdam,’ concludes Polman. ‘Here we are, five centuries later, doing exactly the same. This time the work is just a billion times smaller.’ <

Professor Albert Polman

Solardam

The solar revolution in Amsterdam

The sun was shining on Amsterdam's science community in 2015 when the Amsterdam Academic Alliance awarded a first substantial chunk of subsidy to Solardam, a research consortium hosting cutting-edge multidisciplinary programmes and exploring new and improved ways to harvest energy from the sun.

text **Steven McCarron** photography **Vincent Boon**

In a sense, the early faith placed in the Solardam project comes as no great surprise. Amsterdam harbours an ever-increasing ethos that renewable energy solutions should not wait for the future but must offer solutions now: even Amsterdam's City Hall is currently decking out its entire roof with solar panels. It also undoubtedly helps that the parties at the heart of Solardam are some of the world's top professionals, researchers, students and organisations involved in nanotechnology. Amsterdam is the perfect place for an initiative like Solardam because, not only is it home to two renowned universities – the University of Amsterdam (UvA) and the Vrije University Amsterdam (VU) – it's also the base of AMOLF, one of the leading European institutes in nanophotonics and the physics of biomolecular science. The Energy Research Centre of the Netherlands (ECN) joins these parties to make up Solardam. Situated just a short drive north of Amsterdam, ECN is the largest energy research institute in the Netherlands, with some 500 staff members working on local and international projects that have the power to influence and improve our day-to-day lives.

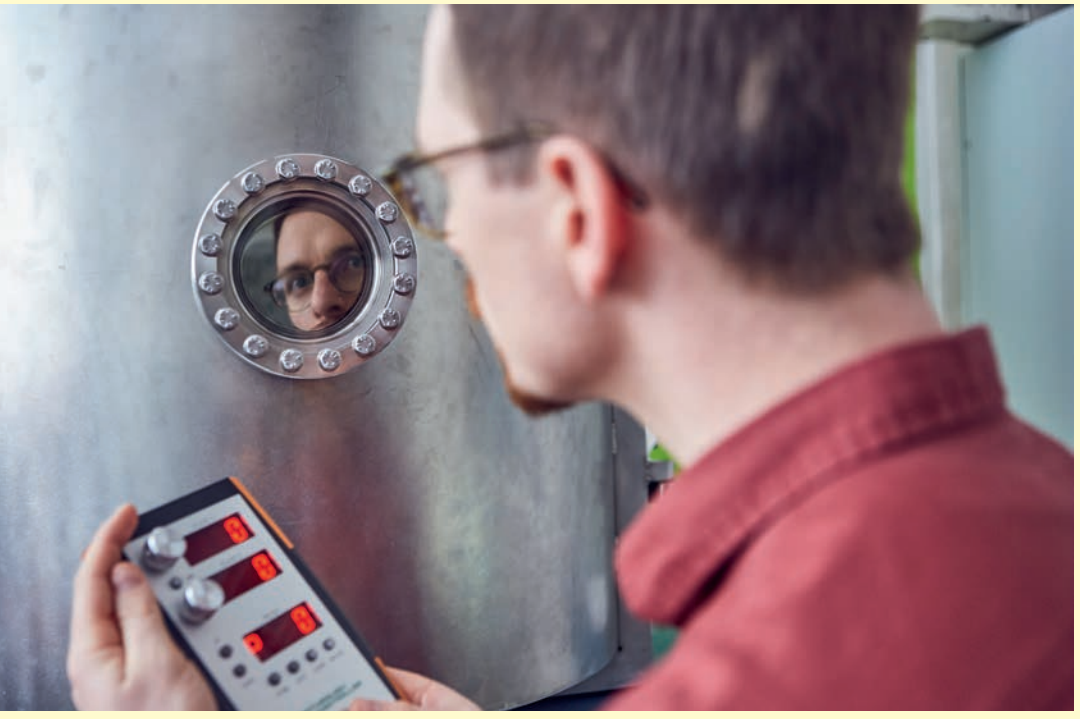
Having served as director of AMOLF from 2006 until 2013, Professor Albert Polman is an international star in the science world – as comfortable on a TV chat show as he is working with his students. Currently leading a scientific group focusing on photovoltaics at the institute, it's logical that he's also a guiding figure within Solardam, collaborating on a number of the consortium's ongoing projects.

'Solardam's subject matter is actually very broad,' he explains. 'Yes, it's about solar panels. But it's also about solar fuels: how can we make fuel from sunlight? And it's also about photosynthesis and photocatalysis: how do you use light to make bacteria or some other biological material that you can then burn as a fuel? Interestingly, many of these topics have a lot in common – like how do we capture the light from the sun, can we change the colour of the light from the sun, or how can this light move on a very small scale? It's all connected.'

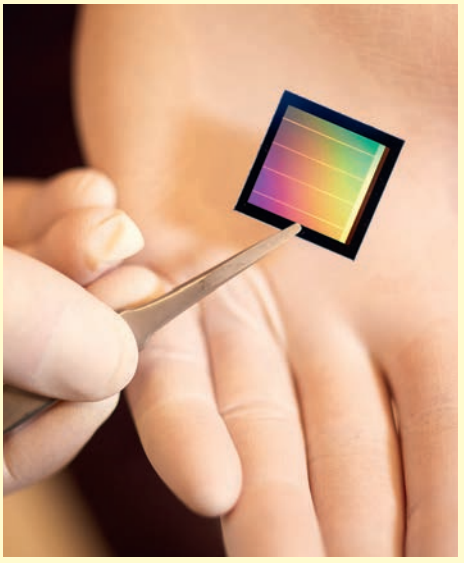
That's why, in just a short space of time, the Solardam consortium has become home to more than 100 researchers from physics, chemistry and biology backgrounds – an energetic group of talents hailing from all over Europe, Asia, North America and Australia.

Dr. Mark Knight of Solardam

‘The world is transitioning to green energy. We’re bringing together the right people from around the globe to carry out the research. And they’ll make the breakthroughs’ (Dr. Mark Knight, Solardam)



The Solardam consortium is home to more than 100 researchers working in physics, chemistry and biology.



Solardam

Amsterdam harbours an ever-increasing ethos that renewable-energy solutions aren't for the future but for the present: even Amsterdam's City Hall is currently decking out its entire roof with solar panels

Together they offer complementary expertise in a host of scientific disciplines relevant to energy research, including nanophotonics, photovoltaics, catalysis and photocatalysis, photosynthesis and multi-scale modelling.

Dr. Mark Knight is one of the postdoctoral researchers busy within Solardam. The American researcher completed his studies in Minnesota and Texas before making a dream move to Amsterdam Science Park to work alongside Polman at AMOLF in 2014. Knight speaks with boundless enthusiasm about photovoltaics and nanophotonic structures, but when asked what this consortium has really brought to the table, he's lightning quick to highlight a new ease of collaboration and communication.

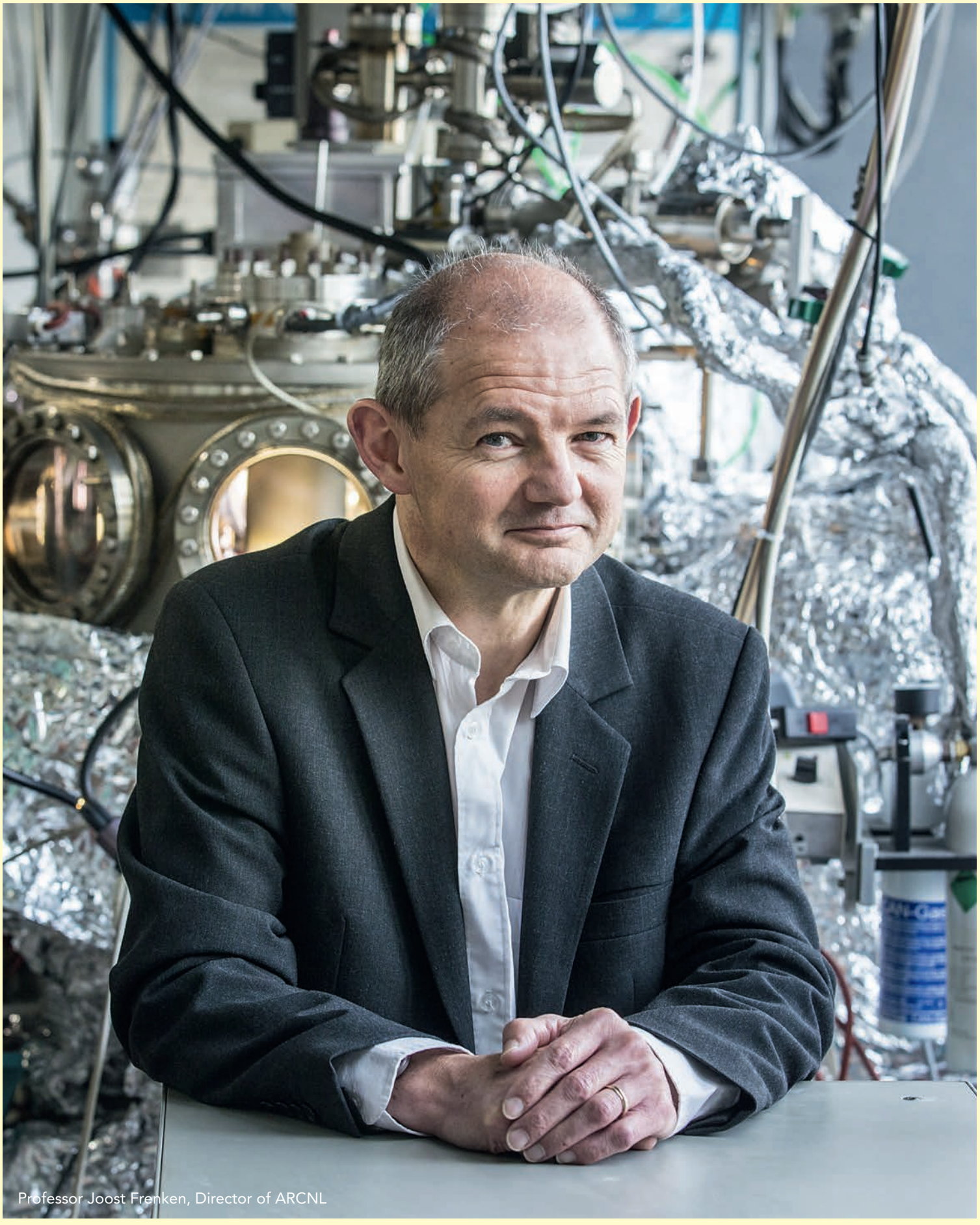
'There's a conversation group of postdoctoral researchers at the heart of Solardam,' he tells us. 'Whenever anybody has a problem, they'll share it with the group. It opens up this huge breadth of experience, so you get back some great answers. For example, I know very little about solar fuels. But one of the solar-fuels people was asking if there is a way to use fractal nanostructures for light harvesting, and *that* is something I know about. So we have some very dynamic sharing going on between researchers who, without Solardam, would have probably never met.'

The consortium's collaborative research is set to have a massive environmental impact, both at home and abroad. For example, Amsterdam's own ambitious climate goals include a target for solar panels to provide power for 85,000 homes in 2020 and 450,000 in 2040. Compared to only 7,500 today, that's a substantial acceleration in the uptake of renewable energy. One of the most viable ways to achieve this is through investment in successful research projects within Solardam, which will in turn spawn new start-ups and drive private companies to deliver commercial products that are both economically and environmentally interesting.

'The Netherlands is transitioning to green energy,' concludes Knight. 'Of course it's happening all over the world as well. But the Netherlands is at the heart of the transition. We're investing heavily in people to solve nano problems, bridging research institutes like the Dutch Institute for Fundamental Energy Research (DIFFER) and AMOLF, and it's happening now with Solardam, too. We're bringing together the right people from around the globe to carry out research. And they'll make the breakthroughs.' <

Solardam, in short

- Solardam was initiated in 2012 and was awarded funding from the Amsterdam Academic Alliance (AAA) in 2015.
- The goal of Solardam is to establish a coherent solar-energy-research programme in the Amsterdam area.
- Core partners include the University of Amsterdam, the Vrije University Amsterdam, the FOM Institute AMOLF and ECN.
- Solardam also coordinates research and collaborates with other energy research initiatives such as the FOM Institute DIFFER and the FES programme BioSolarCells, and it maintains close links with the world's top energy-research centres.
- At present there are nine Solardam kick-off projects in action due to AAA seed funding.
- There are around 100 researchers involved in Solardam, and talent within the group has accumulated three European Research Council (ERC) Advanced Grants, 2 ERC Consolidator Grants, 3 ERC Starting Grants, 8 NWO Vici grants, plus numerous NWO Vidi and smaller grants.
- Solardam's scientific advisory council is composed of renowned senior scientists from major international energy-research institutes.



Professor Joost Frenken, Director of ARCNL

Future-proof technology

A forward-thinking collaboration between academia and industry is putting Amsterdam in the fast lane on the global roadmap towards more innovative nanotechnology.

text **Jayne Robinson and Ed Aanhane** photography **Ivar Pel**

Back in 1965, Intel co-founder Gordon Moore made an observation that would shape the next 50 years of technological innovation. His famous prediction that every two years technology would shrink by half became known as 'Moore's Law' and has held true for half a century, setting the pace for our modern digital revolution.

The scaling down of microelectronics has occurred hand in hand with our modern lives. Technology that just 50 years ago filled an entire room is now available in a single microchip, and we've all heard the old adage that a modern-day smartphone has many times the processing power of the Apollo computers, which took us to the moon. But even more amazing is the sheer speed at which this scaling down has occurred. For 50 years technology has bounded on, hardly drawing breath as it shrunk down again and again in accordance with Moore's Law, eventually to the nanoscale. After such a zealous sprint, it's unsurprising that ever more effort is required to maintain this pace of scaling down. And as Moore's Law shrinks towards its seemingly unavoidable conclusion, an inevitable question arises: how much smaller we can actually take technology – and what will the next 50 years hold for the field of nanolithography?

Never a city to shy away from a challenge, Amsterdam created the Advanced Research Centre for Nanolithography (ARCNL) three years ago, in direct response to one of the most significant technological predicaments of our time. That is, developing the tools needed to build the nanotechnology of the future and keep the train of innovation on track.

The organisation that inspired the creation of the ARCNL was Dutch semiconductor equipment manufacturer ASML. Employing more than 8,000 people at its headquarters in Veldhoven, the company's guiding principle is continuing Moore's Law with ever smaller, cheaper, more powerful and more energy-efficient semiconductors.

Mobilising minds

In the Dutch spirit of collaboration, ASML decided to reach out to the academic science community to help fuel the pace of their innovation. Their request was not for an applied science collaboration, but for a fundamental research institute, whose insights could potentially lead to applied capabilities in the future.

Four different organisations made a bid to ASML for the partnership, and in 2013, a plan created by a cooperative group based at the Foundation for the Fundamental Research on Matter (FOM) in Amsterdam beat off stiff competition to be awarded the prestigious project. Partnering with FOM on this scientific dream team, in addition to parent organisation the Dutch Organisation for Scientific Research (NWO), were Amsterdam's two universities: University of Amsterdam (UvA) and the Vrije University Amsterdam (VU). Extra funding from the city of Amsterdam and the province of Noord-Holland completed the mix, and thus ARCNL sparked to life.

While the partnership plan proposed by ARCNL was undoubtedly the strongest, its location at Amsterdam Science Park was also a key factor in it winning the project. Thanks to its world-class facilities, the knowledge-sharing scientific community and the attractive quality of life in Amsterdam,

ARCNL

How much smaller can we actually take technology, and what will the next 50 years hold for the field of nanolithography?

Facts & figures

- Nanolithography is the branch of nanotechnology concerned with the study and application of fabricating nanometre-scale structures.
- Semiconductor equipment manufacturer ASML was founded in 1984 and has 70 offices in 16 countries, employing more than 14,000 people.
- ARCNL is a public-private partnership between the Foundation for Fundamental Research on Matter (FOM), the UvA, the VU and the ASML.
- ARCNL launched on 1 January 2014 as part of the FOM institute AMOLF. ARCNL officially decoupled from AMOLF on 1 September 2015 to become an independent research centre.
- Professor Joost Frenken is the Director of ARCNL.
- With ARCNL's strategic position at Amsterdam Science Park, it is embedded among other pioneering researchers in a stimulating environment for cooperation, collaboration and the exchange of ideas.

ARCNL proved an irresistible magnet to attract the best scientific minds from around the globe.
Professor Joost Frenken, director of ARCNL explains: 'ASML is quite efficient in exploring the local academic market in their Eindhoven area. So one of the appeals for them was that they were now going to fish in a completely new pond of expertise and experts – now with a whole army of experts mobilised to work on the development of technology for ASML.'

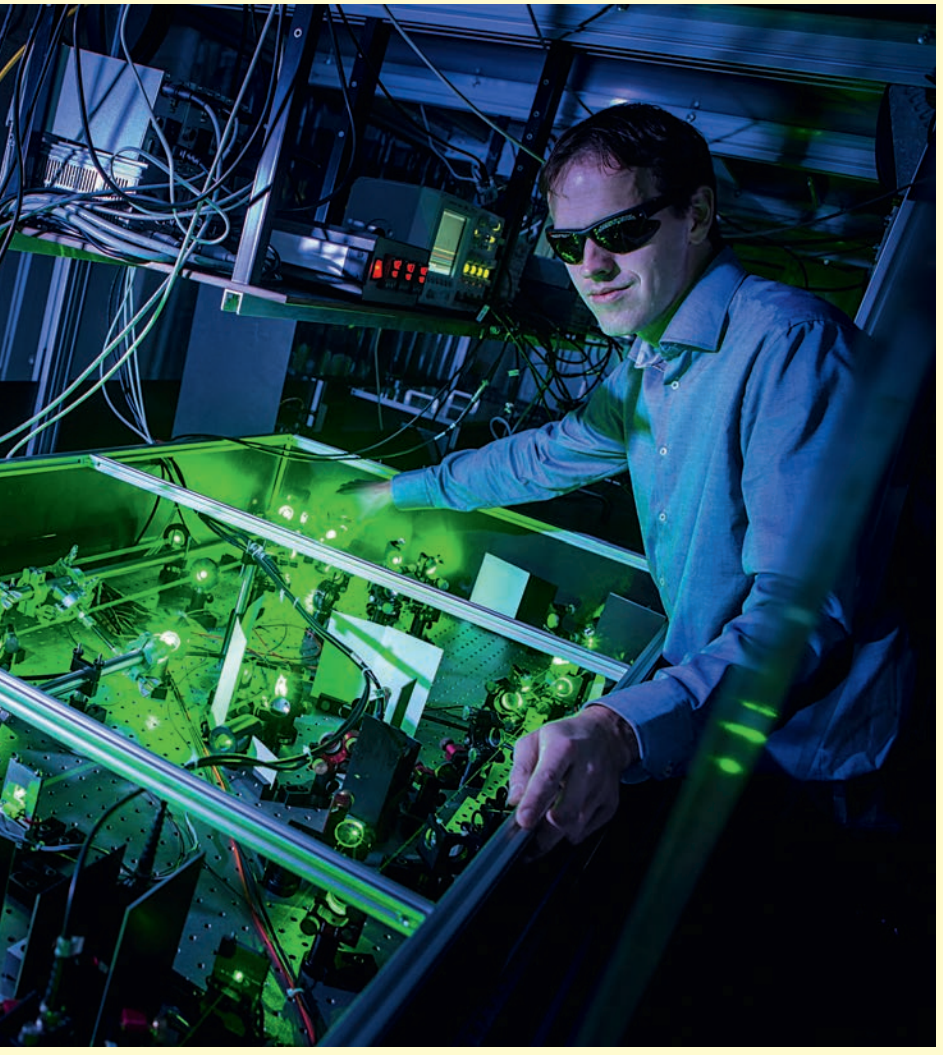
Predictive principles

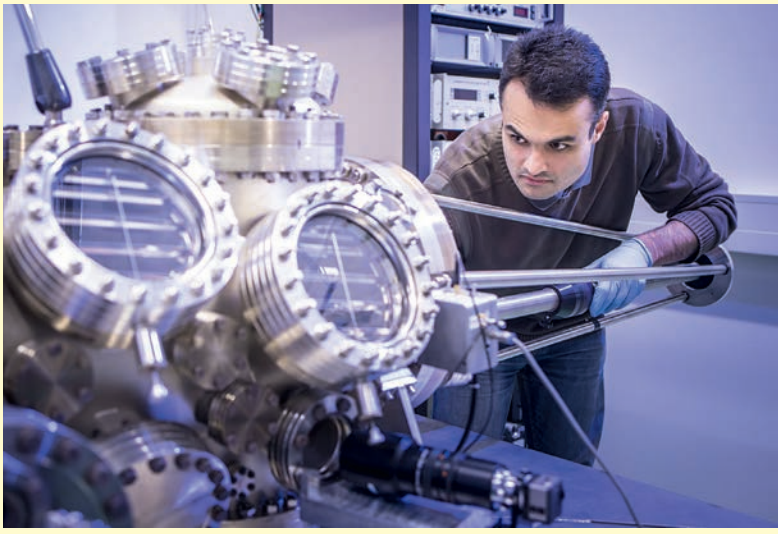
And so it came to pass. Opened at Amsterdam Science Park under the FOM umbrella, ARCNL today functions as an independent research institute housing up to 100 Dutch and international researchers. And it's certainly in good company. This 70 hectare park in the east of the city boasts the highest concentration of publicly funded research in the Netherlands, being home to no less than eight UvA research institutes and three institutes of the NWO.
So, now that it's operational, what is ARCNL actually up to? In short, it's a lab for fundamental long-term research, aiming not just to solve the problems of today or even this year, but developing knowledge that will impact technology for the next decade. Of course, the real question must be: how do we know what technology we'll need five years from now? Professor Frenken believes it all comes down to a finely balanced combination of experience and vision. 'You need some sort of gut feeling in a sense. On the other hand, what a company like ASML does is to really think ahead. To be able to create the products their customers will need five years from now, ASML needs to be able to already predict them now. And this is where Moore's Law comes in. Since the mid-1960s, Moore's Law has not just been an observation but it has served as the roadmap for the industry. ASML made a pact with all their colleagues in their field to stick to that law. This means that the law always tells them where to be five years from now – actually getting there takes collective collaboration, of course. This means that ASML has to work on this, Intel has to work on it – all their suppliers and customers have to work on it, too. The industry knows five or ten years in advance how small dimensions need to be, how cheap structures need to be, what other conditions need to be met. They can collectively decide upon these things with Moore's Law as a guiding principle.'

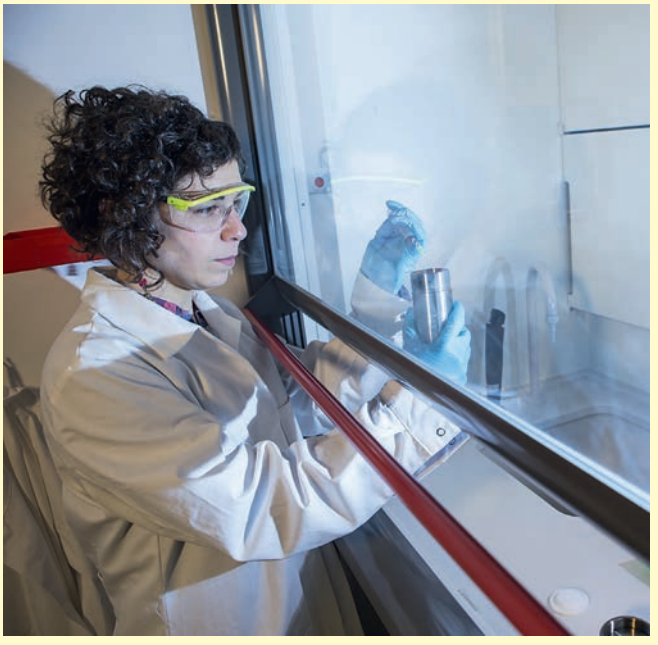
Fuelling the fires of innovation

ARCNL is made up of nine research projects, all focusing on a particular part of the chip-producing process. These range from the laser used to create the tin plasma and the nano layers in the mirrors that focus light all the way to the photoresist layers on the silicon wafer on which the actual chips are being created. But no matter what angle each project is coming from, their overarching goal is to unravel the fundamental principles behind the techniques used in nanolithography.
The initial research programme of ARCNL has a strong emphasis on the physics involved in the generation of high intensities of EUV light, optical elements for EUV light, EUV photo-chemistry, and a variety of future technologies and associated phenomena. But the main focus of the institute's research will evolve alongside changing scientific insights to keep the ARCNL continually at the forefront of this cutting edge field, and well positioned to make breakthroughs in nanolithography that will inform and shape the technology in everything from computers and communication devices through to vehicles and household equipment.
As Professor Frenken explains, 'You need to put more wood on the fire to keep it going, and you also need to mobilise more brains to keep building the blaze at that high speed. And that's what we are for. ASML recognises that, as time advances, it will require more and more intellectual input to keep going. They're visionary, and they'd like to work with academia because they really see that, to get further, we need to work on two fronts: we need to advance our knowledge and we need to very quickly get that new knowledge incorporated into practical technology. That's what ASML is extremely good at. So working as a team is the best thing that we can do.' <

ARCNL is well positioned to make breakthroughs in nanolithography that will inform and shape the technology behind everything from computers and communication devices to vehicles and household devices







Inside ARCNL

Amsterdam welcomes talent from all over the world with a number of attractive incentives, from advice and support to tax reimbursements. Your red-carpet welcome awaits.

Welcoming talent: from red tape to red carpet

For the smart and ambitious, Amsterdam is a popular place to settle down in Europe. It is a city that attracts people who want to study, launch new businesses and grow existing ones – and a place where multinationals converge due to the high-quality talent. The Dutch immigration office is very welcoming to highly skilled migrants, enabling many Dutch companies, research institutions and other organisations to bolster their teams with international talent. Global citizens know what a hassle it can be to put down roots in a new city due to the bureaucratic paperwork. Luckily, the Amsterdam Expatcenter cuts through the red tape for the Amsterdam Metropolitan Area's growing number of international companies, start-ups, migrant employees, researchers and graduates. To simplify hiring via the 'highly skilled migrants scheme', the Expatcenter takes care of many of the necessary formalities, including organising residence permits and registration with the municipality.

Support and advice

The Amsterdam Metropolitan Area is also a great place for spouses and children, and the Expatcenter offers information and advice for the partners and families of international employees in the Netherlands to help them settle into Dutch life.

Orientation year

The orientation year ('zoekjaar') permit allows recent bachelor's and master's programme graduates (from both Dutch and international universities) from non-EU countries to stay in the Netherlands for a period of up to twelve months. During this period, they have free access to the Dutch labour market and can start working without their employers having to apply for a work permit for them.
The orientation year scheme has recently been improved: the new policy enables international graduates to apply for this special permit within three years of their graduation instead of the previously allowed one year. This allows graduates to first return to their home country for up to three years before returning to the Netherlands to seek employment. Scientific researchers will also be eligible for the permit.

30% tax ruling

Highly skilled migrants moving to the Netherlands for a specific job can also apply for the 30% reimbursement ruling. Under specific conditions, the employer can grant a tax-free allowance equivalent to 30% of the gross salary subject to Dutch payroll taxes. This tax break makes the move to the Amsterdam Metropolitan Area even more attractive for international talent.

Annual international talent event

International talent and internationally orientated organisations are also invited to join the annual International Talent Event Amsterdam in April. Here you can connect with potential employers or talent about internship possibilities, graduate assignments, traineeships or future full-time jobs – all with a global mindset.

Work portal and job search tool

I amsterdam's work portal (iamsterdam.com/work) is a great place to find information about job fairs, online job postings and international groups and clubs.

Facts and figures

- Helped settle 10,492 customers in the Amsterdam area in 2015.
- Of these, 66% came from outside the EU and 34% from within the EU.
- This represents a growth of 26% since 2014.
- More than 900 companies worked with the Expatcenter.
- Since its inception in 2008, the Expatcenter has helped more than 45,000 customers.

This new regulation allows ambitious entrepreneurs to apply for a temporary residence permit in the Netherlands. The so-called 'scheme for start-ups' gives entrepreneurs from outside the EU one year to launch an innovative business in the Netherlands. Under the scheme, new international start-ups will be offered the necessary support to develop into mature enterprises. This scenario is not only beneficial for the entrepreneur, but also creates a solid foundation for job creation and economic growth in the Netherlands. For full details, see iamsterdam.com/startup.

illustration: Leendert Masselink

Professor Michel Haring

Interview with Michel Haring

In green we trust

Amsterdam's Green Campus has formed a braintrust for the green sciences. Founder Michel Haring explains how.

text **Matt Farquharson** photography **Gregor Servais**

There aren't many cities that can claim to be leading an agricultural revolution.
In most countries, the cities handle the services, manufacturing happens a bit further out and the muck and mud of green sciences happens over the hills and far away. But in the densely populated Netherlands, there are no hills, and nowhere is that far away.
Yet, this is the world's second-largest exporter of agricultural products, with exports worth €79 billion in 2013, second only to the US. And beyond the bulbs, seeds, flowers and vegetables, it is also a renowned centre of knowledge, with most of the brains clustered in the greater Amsterdam area.
'I have met many different companies that were not aware that Amsterdam boasts a large knowledge centre for chemistry, life sciences and ecology,' says Michel Haring, Professor of Plant Physiology at the University of Amsterdam.
'Companies were taking their questions elsewhere, and when I realised that, I decided we need to advertise ourselves more and share what we have in terms of research and education.'
And so, Amsterdam Green Campus was born. Haring describes it as a platform for bringing together all those involved in the green industries 'to bring education closer to industry, and closer to the companies that will hire people'. And the range of talents is broad, too. Think educators, researchers, industry and government in all their guises, from those that toil in overalls to those that work in lab coats.
The work of the campus is divided into three areas: genetics (breeding plants and vegetables), environment (sustainable horticulture and greening cities) and chemistry (product innovation and sustainable raw materials).
While the campus doesn't have a physical space of its own, many of the researchers and scientists involved are based at Amsterdam Science Park, Europe's largest hub for science education, research and entrepreneurship. It is also connected to the broader Amsterdam Innovation Exchange, which brings together academics, employers, educators and the government in a number of fields, including healthcare.

Supporting industry

One of the main goals of Amsterdam Green Campus is to help educational institutions provide the right training and develop the skills that the business world needs, from entry-level greenhouse staff to site managers, technicians, researchers and leaders of industry. 'We collaborate with other institutions and help develop new kinds of education,' explains Haring.
The Dutch education system is roughly separated into three streams: vocational, professional and university-level.
'We aim to connect all the students of these different levels to the university level. Not that they all have to be university students, but they should know what's happening,' Haring says. 'One of the bigger aims is to make students more aware of what is going on at the different levels. That way, they'll

Interview with Michel Haring

‘It’s chemistry, life sciences and ecology – a very broad spectrum of knowledge – all rolled into one platform. What happens here is world-leading’ (Michel Haring)

How it works
Amsterdam Green Campus is a platform that brings together educators, researchers, industry and government. It works in three main areas:

Green genetics
Improving the breeding of plants, vegetables and grasses.

Green environment
Developing sustainable horticulture and greening our cities.

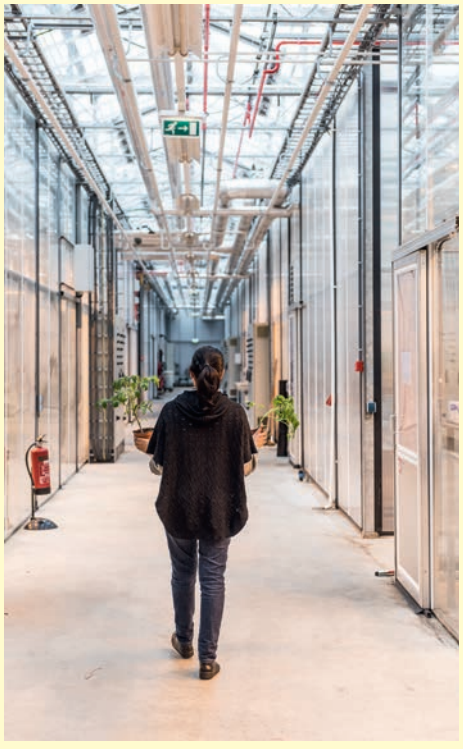
Green chemistry
Using chemical research for product innovation and the sustainable use of raw materials.

For more, visit
www.amsterdamgreencampus.nl

be more enthusiastic and better prepared for work.’
On the simplest level, the campus gives masterclasses to students, but it also trains lecturers in the latest developments in green sciences and offers guidance on educational policy. It is preparing youth for undergraduate courses, based on the three strands of genetics, environment and chemistry.
‘There are a lot of changes happening in life sciences, and companies would like their people to be prepared, not only at an academic level but also at a practical level. Because things change so rapidly, we want to be more dynamic. We want to carry out the training so that students graduate with more than just the basic knowledge required to pass.’
Haring cites a ornamental-breeding initiative as a recent success. ‘Some of the staff in this industry were trained years ago, and we are now in a completely different era, where more molecular knowledge is needed,’ he says.
Through the campus’s Novel Breeding Tools programme, developed by Inholland lecturer Nelleke Kreike, breeders were taught about the latest research and methods. ‘This is a training programme that really helps small companies who do not have access to all this knowledge,’ Haring explains. ‘Companies that were not able to assess whether they should adjust their process to modern tools or not. For the first time, they could see what is possible and whether they could implement it, what it costs and whether they would benefit.’

Student access
Beyond the teaching help it offers employers and educators, a key part of the campus remit involves bringing students, researchers and companies together, often through the Green Student Lab. ‘By giving our students the role of explorers, we hope to use the power of these young students to tackle real questions that companies have,’ says Haring.
The lab is a prime example of how the campus benefits all involved. Firms get access to the Science Park and equipment they might not have themselves, and they also get free student talent to work on their research. The students, on the other hand, benefit from practical experience, while the universities get insight into the needs of employers.
‘You get better, better-trained people,’ Haring says. ‘The equipment we have means companies can explore different areas of research, and it’s cheap. You can do pilot research without having to spend lots of money.’
This kind of collaborative approach is common across the Netherlands, and should go some way to securing Amsterdam’s position as a leading exponent of green sciences for generations to come.
‘At the moment, this is a unique platform in the world,’ says Haring, ‘because it’s chemistry, life sciences and ecology – a very broad spectrum of knowledge – all rolled into one. What happens here is world-leading.’
And all within a few minutes of the city centre, with not a muddy boot in sight. <

Inside the Amsterdam Green Campus



Enza Zaden owner Jaap Mazereeuw

Interview with Jaap Mazereeuw

Seeds of change

On a quiet peninsula north of Amsterdam, one firm is changing the way we eat.

text **Matt Farquharson** photography **Amke**

In the classic fairy tale, Jack swapped his cow for a few magic beans and got scolded by his mother. But if he had made the trade in North Holland's 'Seed Valley', she might have been a lot happier, as this is a place where a kilo of tomato seeds can cost the same as a family car. According to Jaap Mazereeuw, third-generation owner of seed producer Enza Zaden, if you're in the green industry, 'this is the place to be.'

Teaching the world how to grow

The Dutch are the world's largest exporters of seeds – be they for fruit, vegetables or flowers – and the business brings in about €1.5 billion annually. What's more, they produce around 40% of the world's new varieties of horticulture seed every year, too. Much of this comes from a small slip of flat land that is known as Seed Valley. The name is a nod to its role as the Silicon Valley of horticultural development, rather than its (hill-free) topography, because much like Silicon Valley in the US teaches the world about the possibilities of new technology, Seed Valley has been teaching the world how to grow food for centuries.

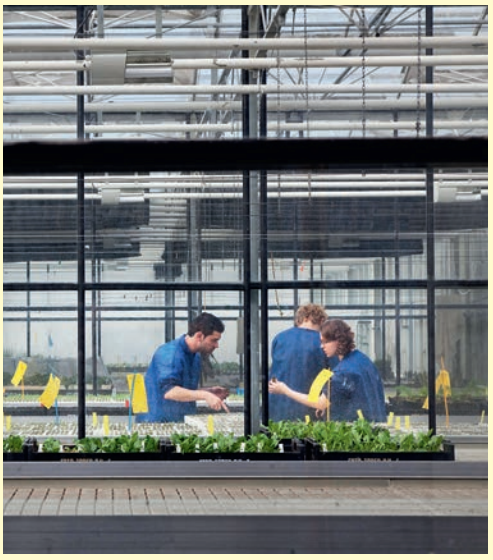
Located north of Amsterdam, this green peninsula juts into the still, blue IJsselmeer Lake and has a microclimate that protects the land from the harshest heat or the coldest frosts. The open ground ensures plenty of natural light, and the area has been exporting its agricultural wares for more than 400 years.

In a class of its own

But why the high price for a humble bag of tomato seeds? In the warehouse of Enza Zaden, Mazereeuw holds a small hessian sack of the precious produce and explains. 'It maybe took ten years of research and €3 million to develop that particular seed,' he says. 'And in the end, every seed will give 35kg of tomatoes. There's a lot of food in here.'

It's that dedication to research that has seen Enza Zaden grow from a small family business that was started by Jacob Mazereeuw in 1938 into a global force, and Jaap – who has worked this soil for decades – is the third generation of Mazereeuw to be in charge.

'As a child, I always had a hobby garden; I sold vegetables to the neighbours when I was 10. My love for plants was already there. I think it was genetic,' he says, laughing.



Inside the Enza Zaden greenhouse

Interview with Jaap Mazereeuw

The Netherlands has a 24% share of the global trade in horticultural products. In floriculture (the growing of flowers, rather than plants), that figure is 50%

The firm now has subsidiaries in 25 countries and about 1,600 staff, and is part of a cluster of agricultural expertise just outside Amsterdam that Mazereeuw reckons is the 'Champions League-standard of horticultural development'.

His claim is backed up by some remarkable figures. The Netherlands has a 24% share of the global trade in horticultural products. In floriculture (the growing of flowers, rather than plants), that figure is 50%.

As well as exporting more seeds than any other nation on earth, the Dutch are also the biggest exporters (in value, rather than volume) of fresh vegetables. Staying that far ahead of the global competition is not down to the efforts of individual companies alone. It is partly driven by the cooperation between commercial suppliers like Enza Zaden, state research institutes and government bodies.

The Seed Valley Foundation, of which Enza Zaden is one of the founders, brings together regional flower, fruit and vegetable-seed producers. With the help of government funding, the organisation has appointed a professor of quantitative genetics at the University of Amsterdam, and has helped launch a bachelor's degree in green biotechnology.

'Seed Valley's mission is to strengthen the economic position and anchor the cluster in North Holland,' says Mazereeuw. 'The Seed Valley Foundation achieves that in part by investing in the cluster's image, which begins in the classroom.'

Alongside higher education, the industry supports vocational courses and school visits. 'We want to show that it's not just dirty work, but that it's high-tech: we have robots and gene sequencers,' he adds.

Meeting all tastes

This level of cooperation is vital in such a long-term, high-tech business. Enza Zaden spends around 30% of its turnover on research and development, making it as much about science graduates in lab coats as agriculturalists in overalls.

'To develop a new variety of seed takes seven to 12 years. We introduce 150 new varieties each year, so there is a constant pipeline of innovation,' says Mazereeuw.

The firm doesn't genetically modify its seeds, but relies on 'classic breeding', whereby two or more types of plant are bred together to see what benefits can be extracted. 'We carry out a great deal of research on resisting pests and disease. In the Netherlands, growers strive to minimise the use of pesticides. We do a lot on resistance breeding to improve product quality and prevent crop loss,' Mazereeuw explains.

Enza Zaden, in short

Jacob Mazereeuw's original greenhouse from 1938, with its white-painted steel and glass, still sits on the site of what is now a global enterprise. Located in Enkhuizen, a small town just a short drive from Amsterdam, Enza Zaden is now run by Jacob's grandson, Jaap, and boasts 1,600 staff and some of the world's best vegetable-breeding talent.

For its first 20 years, the company focused solely on producing and selling seeds, but in the early 1960s, Piet (Jacob's son) began breeding schemes and soon made a breakthrough with the highly popular Extase variety of tomato. Today, the firm spends about one third of its turnover on research and development. It sticks to 'classical breeding' – that is, breeding together two or more varieties to try and extract something new – without genetic breeding modifications.

Its main breeding programmes include tomato, cucumber, sweet pepper and leafy green vegetables. It has subsidiaries on every continent and seed-production sites around the world. It currently sells around 1,100 different varieties of seeds.

Enza Zaden is also one of the founders of the Seed Valley partnership of horticulture firms, which focuses on educational programmes, on guiding government policy and advises Dutch academic institutions on the talent needs of this high-tech industry.

Interview with Jaap Mazereeuw

‘To develop a new variety of seed takes seven to 12 years. We introduce 150 new varieties each year, so there is a constant pipeline of innovation’ (Jaap Mazereeuw, owner of Enza Zaden)

‘All the knowledge is in the genetics, and the seed is the package. It has to do with yield consistency, reliability and consistency against environmental stress. Every market has its own needs. We have 1,100 varieties and each line is tailor-made. They vary a lot in their responses to climate, soil, disease, temperature, hours of daylight, whether grown in soil or a greenhouse. And for the consumer, it’s about health, no pesticides and long shelf life.’

Mazereeuw adds that his business is ‘multi-local’: while most of the research happens in North Holland, product development is driven by demand in the firm’s breeding centres all over the world, and the needs vary wildly around the globe.

He gives the humble cucumber as an example: ‘In the Middle East it’s short – about 18cm. In Europe it’s about 30cm, but in China it’s 35cm with spines, and in South East Asia it’s green and white. The uses are also different: we use it in salads, in Asia they use it in cooking.’

In Africa and Asia, with growing populations, larger distances from farm to table and more extreme weather, shelf life and reliability have become more important. ‘In Indonesia, we have sold seeds to 1.1 million farmers who have seen their incomes rise 20 times because of better yield and reliability,’ says Mazereeuw.

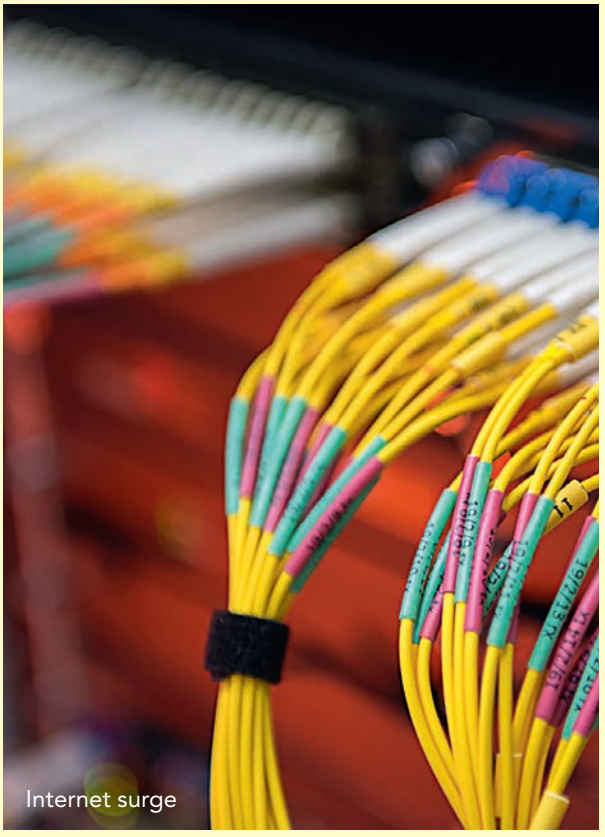
And then there is the significant matter of flavour. For Europe, vegetable-variety-development tends to focus on taste. Enza Zaden developed a green pepper for European markets, for example, that matches the full taste of a more ripened red pepper, but keeps its colour to fit with the red, yellow and green ‘traffic light’ packs popular with consumers. ‘There’s no such thing as a ‘good taste’. Tastes vary per region, but also through your life. We provide choices,’ explains Mazereeuw.

All this kind of expertise requires a steady stream of talent, however. Firms in this cluster are estimated to be growing by around 8% per year. In the case of Enza Zaden, Mazereeuw reckons that ‘we need 100 new people every year’.

And given the fact that as few as 2% of trials result in a seed that goes to market, creating ones that meet all those demands might take a little magic after all. <

The facts and numbers behind Amsterdam's knowledge and tech sectors.

text **Elizabeth James** and **Steven McCarron**


Internet surge

1

Amsterdam's internet surge

Pioneers of connectivity and WiFi

In 1988, The Centrum Wiskunde & Informatica (CWI) in Amsterdam was granted access to an academic computer network that would later become known as the World Wide Web. As the first organisation outside the US to connect to the Internet, the CWI was to become an important network hub for Europe. Three years later, in 1991, technologist and 'Father of WiFi' Vic Hayes invented the precursor to the wireless local area network (WLAN) while working for the Netherlands' NCR Corporation. And today, Amsterdam is home to the largest data-transport hub in the world, the Amsterdam Internet Exchange (AMS IX).

2

Hundreds of English-taught degrees

The University of Amsterdam (UvA) alone offers 150 English-taught degree programmes – one of the largest selections of any university in Europe – and around 11% of the students are international. The Vrije Universiteit (VU) offers a similar number. Both universities score highly in various global rankings, consistently being named amongst the top 30 universities in Europe and the top 100 worldwide. In the Amsterdam Metropolitan Area, the UvA and the VU form the Amsterdam Academic Alliance: a collaboration that encourages student-led research projects involving industry professionals.
(Source: The Times Higher Education World University Rankings)

3

Brand new start-ups

The summer of 2016 sees the birth of the ACE Venture Lab, nurturing 50 science and high-tech start-ups in a new space located in Amsterdam's Science Park. The start-up village, located next to the University of Amsterdam's Faculty of Science, is intended as an innovative hub – one where science and business come together in a conducive environment. The space is designed by the young Amsterdam architect Julius Taminiau, and is constructed primarily out of shipping containers; the prioritised layering of the containers is intentionally built to foster rational development for those working and moving within them.
(Source: Amsterdam Science Park, 2016)

4

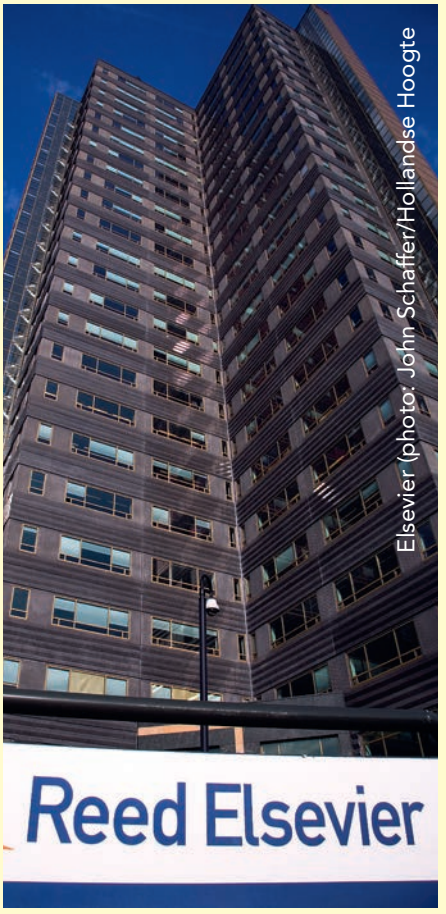
90,000 research publications

Amsterdam has a strong claim to being one of the top knowledge cities in Europe – and it has the statistics to prove it. Amsterdam produces a high level of research per capita: from 2004 to 2013, researchers in Amsterdam produced over 90,000 research publications, or approximately 0.45% of all publications in the world. In a comparative study with 10 other peer cities over the same time period, the relative impact of Amsterdam's research was the highest and its research output per capita was second only to Copenhagen.
(The other cities in the study were Barcelona, Berlin, Brussels, Copenhagen, Dublin, Hamburg, Madrid, Manchester, Stockholm and Vienna.)
(Source: Elsevier and Urban Innovation Network, Mapping Research and Innovation: Understanding Amsterdam's Competitive Advantage, 2015)

5

Amsterdam is the new European Capital of Innovation

Amsterdam was named 2016's European Capital of Innovation for its holistic vision of urban governance, economics, social inclusion and quality of life. As the winner of the European Commission's iCapital competition, the city will retain the prestigious title until 2018. According to the jury, which was a panel of high-level independent experts, Amsterdam was chosen because it embraces a bottom-up approach based on smart growth, start-ups, liveability and digital social innovation. The competing eight finalists were Berlin, Eindhoven, Glasgow, Milano, Oxford, Paris, Torino and Vienna.
(Source: European Commission, The European Capital of Innovation Award - iCapital, 2016)



Elsevier (photo: John Schaffer/Hollandse Hoogte

Interview with Ger Baron

Experimenting for societal impact

Amsterdam Smart City is working on multiple innovative, tech-driven initiatives to solve Amsterdam's most pressing urban challenges, including mobility and the transition to renewable energy.

text **Catalina Iorga** photography **Gregor Servais**

'I wouldn't be surprised if we're the world's most experimental city per capita in terms of ICT pilot initiatives. But what sets us apart is that we don't experiment for the sake of it; we strive for positive societal impact,' says Ger Baron, Chief Technology Officer of the City of Amsterdam since 2014 and chair of the steering comittee of Amsterdam Smart City (ASC). ASC is a unique partnership co-founded in 2009 by, amongst others, the Amsterdam Economic Board, the Municipality of Amsterdam, energy provider Alliander, design consultancy Arcadis, the Amsterdam University of Applied Sciences (Hogeschool van Amsterdam) and the Amsterdam ArenA – home to Amsterdam football club Ajax and test lab for the stadiums of the future.

Google 'smart city' and you will see ASC's homepage as the second organic search result, surpassed only by Wikipedia's entry on the topic. Whereas Wikipedia dedicates nearly 1,800 words to contouring what a successful smart urban development looks like, Baron cuts right to the chase: 'A smart city uses technology to foster economic growth that is also sustainable, while improving the quality of life of its inhabitants.' ASC is very much a goal-oriented platform: 'We want to give people more options so they can make smarter choices in different areas, such as energy, education, healthcare and mobility.'

For Baron, a smart city is more than the implementation of various technologies that enable these more informed choices. 'Ultimately, I see the city as an open platform able to meet residents' demands through resource-efficient and user-centric solutions. We provide the connectivity, energy and data necessary for start-ups and entrepreneurs to develop their solutions.' Amsterdam was the first city to dub itself an open platform, Baron points out, with places such as Barcelona, Dubai and Singapore now following its lead.

The smart tipping point

Alongside 100 project partners, including businesses, local authorities, research institutes and the city's residents, ASC is working on more than 90 innovative, tech-driven initiatives to solve Amsterdam's most pressing urban challenges, including mobility and the transition to renewable energy. 'We've reached a tipping point where ASC is no longer trying to do things better, but to do things differently,' Baron explains. For instance, through the integration of IT solutions and smart energy grids, the ASC is pioneering the establishment of a distributed energy network as a means to make the city more sustainable.

A prime example on the energy front is the Vehicle2Grid pilot. Launched in 2014 as a three-year project, this program gives residents of Amsterdam's Nieuw-West district the chance to store locally produced energy from solar panels in their electric car battery, or to feed it back to the grid. The results speak for themselves: the project saw one household's dependence on the energy grid drop from 74% to 40% in a year's time. 'Vehicle2Grid proves that successful smart-city initiatives can be small; we started with 100 vehicles, but what we learned has the potential to change the way we design an energy grid,' Baron adds.

Tech goals in the stadium

The Amsterdam ArenA is the quintessential ASC Living Lab, a testing ground where, in addition to mobility, companies can trial new innovations in areas such as sustainability,

Amsterdam's Chief Technology Officer Ger Baron

Interview with Ger Baron

The municipality has an ambitious vision for Amsterdam's future: one million solar panels, a rain-proof city and the best energy system of all the world's capitals

Ger Baron, in short
Ger Baron has been Chief Technology Officer (CTO) of the City of Amsterdam since 2014. Previously, he was programme manager for the Amsterdam Economic Board's IT cluster, running projects on smart city development, human capital, e-health and big data, as well as programme manager for the Amsterdam Innovation Motor, where he developed the unique Amsterdam Smart City partnership and helped establish the concept of Amsterdam as a living lab.
As CTO, Baron identifies exciting urban innovations to implement in the city, acts as a contact point for research institutes such as the newly founded Amsterdam Institute for Advanced Metropolitan Solutions (AMS), strategically advises the city council on anything tech-related and ensures that Amsterdam remains a safe space for start-ups to experiment and grow.

entertainment, visitor experience and safety. 'While most stadiums rely on government subsidies to survive, the ArenA is probably the only sporting venue of this kind making a profit. And our ambition is to turn it into the most technologically advanced stadium in the world,' Baron says. In the process, ASC is also using the immense potential the stadium has to, for instance, provide real-time traffic information data that can help improve mobility. 'Every two weeks Ajax has a home game and football supporters travel a combined 2.1 million kilometres to attend,' he explains.

An urban lab
'ASC and its Living Labs make up just one of the four elements that turn Amsterdam into an urban testing ground. The others are the compact and accessible city itself, a strong ecosystem of innovative start-ups and the Amsterdam Institute for Advanced Metropolitan Solutions,' says Baron. The last, also known as AMS, is a public-private institute co-founded by a consortium of academic partners (the Delft University of Technology, Wageningen University and the Massachusetts Institute of Technology), societal partners (ASC, the Waag Society and the City of Boston) and industry partners (including KPN, Accenture, Alliander and Cisco) that officially opened in 2014.
'As the city's Chief Technology Officer, I consult with AMS on a regular basis to ensure that their research is relevant to the city and to help implement exciting projects on a city-wide basis,' Baron explains. AMS is fully supported by the Municipality of Amsterdam, which will be sharing open data with AMS researchers. The Municipality will also facilitate the use of the city as a testing and piloting site for AMS as it tackles challenges including resource and food security, mobility and logistics, water and waste management, and health and well-being.
Recent AMS projects include the year-long circular-economy initiative 'Prospecting the Urban Mines of Amsterdam' (or Urban Pulse), launched in January 2016.
Within the project, Leiden University and the Delft University of Technology join up with the Amsterdam-based Waag Society, an institute for art, science and technology, and Metabolic, a systems consulting and cleantech development firm, to create an interactive geological map of the built environment, as well as a plan to harvest and repurpose metals such as steel, copper, aluminium and gold from urban structures.

Building a future-proof city
The municipality has an ambitious vision for Amsterdam's future, if its iconic plan to install one million solar panels – one per Amsterdammer – is anything to go by. 'We also want to make the city rain-proof and ensure it has the best energy system of all the world's capitals,' Baron says.
And this vision will definitely benefit from the existing ecosystem of companies working together to combine expertise in areas such as IT, electronics and energy. For instance, February 2016 saw the launch of a multidisciplinary collaboration between Philips, Cisco and Alliander on a smart, energy-saving lighting and public-WiFi scheme at the Hoekenrode shopping square next to the ArenA.
Businesses that share the city's ambition to solve societal and urban challenges are encouraged to open up shop in the Dutch capital. 'Entrepreneurs should be open to participating in this collaborative network. As a city, we're not looking for a quick win, so businesses with a long-term perspective that are willing to accept setbacks can really thrive here,' Baron explains.
In addition to a fully fledged private-public ecosystem, new entrepreneurs can take their pick from more than 130,000 students in the city, many of whom are increasingly focused on metropolitan solutions. Students of the Amsterdam University of Applied Sciences recently built a self-steering garbage-collection boat that is not only cleaning up the city's canals, but also proving there is enough talent in Amsterdam to power many innovative start-ups. In Baron's own words, 'If you are into creative, disruptive models, Amsterdam is the place to be.' <

AMS Institute

The Amsterdam Institute for Advanced Metropolitan Solutions (AMS) is an ambitious scientific institute launched in 2014. AMS sees science, education, government, business and societal organisations working closely together to address the complex urban issues the Amsterdam Metropolitan Area faces.

The institute researches urban flows, such as water, energy, waste, food, data and mobility, to develop a deep understanding of the city and design and implement solutions for its challenges.

AMS focuses on building a circular and connected city through applied technology via a unique consortium of public and private partners – namely the City of Amsterdam; private partners such as Accenture, Cisco, Waternet, Liander, TNO and IBM; and three academic partners: the Delft University of Technology (TU Delft), Wageningen University and MIT. Through these educational partners, dozens of students will receive AMS certifications this year alongside their degrees. There is also a summer course, and a new Massive Open Online Course (MOOC) is offered on the EDx platform, for which 8,000 people signed up this past January.

Using Amsterdam as a living lab to assess urban solutions, AMS benefits from the full support of the municipality, which not only helps fund the institute, but also contributes, for example, by sharing city data with AMS researchers and always being the first client to embrace AMS's urban resolutions. What's more, all AMS projects must involve the city's residents, whom are regarded as testers, users and co-creators.

AMS's testbeds include the recently opened Student Hotel, where student guests can stay for a maximum of one year. Pioneering the concept of a hotel as a social research lab, AMS – working with energy provider Alliander, installation engineers Bectro and Wageningen University – is investigating ways to reduce energy and water consumption in places with short-term inhabitants.

Another example is STAD, a collaborative experiment between several Dutch cities testing how prepared current city infrastructures are for the arrival of self-driving cars. And the upcoming 'The Feeding City' research programme will explore how sustainably producing more food in metropolitan areas could make cities less dependent on imports.

Although Amsterdam is where AMS develops and tests its urban solutions, the institute aims for these solutions – now in the start-up phase – to be adopted by cities around the world.

Looking down the Amsterdam 'Knowledge Mile' (photo: Maarten Terpstra)

The Knowledge Mile

Amsterdam's smartest street

Welcome to the Wibautstraat, one of Amsterdam's busiest thoroughfares. If the people behind the Knowledge Mile have their way, this so-called 'smartest street in the city' is about to get a whole lot smarter.

text **Lauren Comiteau**

Housing several universities and institutions of higher learning (the Amsterdam University of Applied Sciences, the Amsterdam School of the Arts and Inholland University of Applied Sciences), the approximately two-kilometre stretch of the Wibautstraat and Weesperstraat from Nieuwmarkt to the Amstelplein has more students than any other street in the city – an estimated 60,000 by 2018. This constitutes an intelligent street by any standard. But Matthijs ten Berge, director of the Amsterdam Creative Industries Network (ACIN) and the brains behind the Knowledge Mile (www.knowledgemile.org), wants to take this smart street to a whole new level. He plans to turn the arterial avenue into an 'applied research ecosystem': simply put, a living laboratory in which to solve today's urban problems.

'I envision it as a tool to show the world what we can do as a network and with the next generation,' says Ten Berge. 'The Knowledge Mile is a community, but it also functions as a test lab. It's a great place to showcase innovations for urban problems.'

It's all about connection. The boards of three local universities of applied sciences that specialise in creative industries and ICT were interested in pooling their research and resources. Through ACIN, they are able to work with industries and government bodies outside the organisation. 'We function as an interface,' says Ten Berge. In addition to the researchers and students associated with these institutions, the Knowledge Mile accommodates industries such as the Dutch Railways company and former newspaper buildings reborn as hotels and creative spaces (The Student Hotel and the Volkshotel). 'We want to bring them together so they know one another and can make the connections,' says ten Berge. 'We're trying to create solutions, and once we have the answers we will try to test them along the Knowledge Mile.'

Case in point: after a local school complained about the prevalence of scooters on nearby streets, the Knowledge Mile brought the relevant parties together to come up with a solution. The result is a street tile for cycle paths that is integrated with light and audio sensors to warn cyclists of approaching scooters. 'It's an example of a prototype solution for a big community problem,' says Ten Berge. The technology will eventually be tested along the Knowledge Mile.

As a living lab, Wibautstraat is the perfect place to experiment. 'You can find almost all the problems of a mid-size metropolis like Amsterdam here on this street,' says ten Berge. He's talking about air pollution, traffic, flooded metros resulting from climate change, overcrowding, mobility issues, an ageing population and even an influx of refugees.

The Refugee Company

The Refugee Company is a Knowledge Mile start-up tackling this last urban problem. Founded by a Dutch woman, Fleur Bakker,

Amstelhuis

This 2015 experiment in new living for the elderly is a simple concept: private housing for able-bodied 70-plussers with communal areas, including a library and a club where they can socialise with other residents and seniors from the neighbourhood.

'It's amazing that it's new, because the idea is very basic,' says Marry van Straten, who formerly specialised in urban vitality at the Amsterdam University of Applied Sciences and who now heads the collaboration between the school and the Amstelhuis. 'This is a place where you can live in your own apartment and still easily meet other people. It's good for older people and the neighbourhood, and it is also commercial.'

And that's what is different about the Amstelhuis: it is a private initiative by real estate developers Cocon Vastgoed, who bought the Amstelhuis after its last incarnation as a traditional old-age home and expect it to be self-sustaining within two years. Volunteers and a few employees currently staff the cafe – known as the Amstelhuis Sociëteit – where a latte can be bought for as little as €1.75.

Lifelong Amsterdammer Dini Oud moved from a third-floor walkup in Buitenveldert to a one-bedroom apartment in the Amstelhuis, where she doesn't have to worry about getting injured or being on her own. 'Every time I come home, even on rainy days on the bike, I'm glad to arrive here,' says the former librarian. 'I see people I know, so I'm not coming to an empty home.'

www.hetamstelhuis.nl

The Knowledge Mile

‘The Amsterdam University of Applied Sciences is designing an app to help refugees and we’re giving them feedback’ (Jay Asad, the Refugee Company)

The Refugee Company

Originally from Palmyra, Syria, lifelong expat Jay Asad found himself in a refugee camp in the Netherlands for more than a year. ‘In the camp, I witnessed guys sitting around doing nothing, waiting for information about their future,’ says Asad. ‘These men had to drop their hammers and run. They want a normal life, they don’t expect to be handed things. They want to be productive and to work – to be seen as an asset to society and not a burden.’

Enter the Refugee Company, a self-funded Knowledge Mile start-up that Asad co-founded last year. Its mission is to connect refugees with paying jobs. In its showroom on the Wibautstraat, artists and craftspeople have space to create and network. There are workshops for different trades, from catering to silk screening and bicycle repair. Paid jobs have included a Booking.com convention where refugees designed banners and gave workshops. Asad also connected a Syrian upholsterer with a Dutch one, which resulted in gainful employment for the refugee. Asad primarily provides refugees with information about doing business in the Netherlands, where the rules and mentality are different from what they were back home, including in his native Syria. ‘We’re constantly on the lookout for jobs,’ says Asad. ‘We have chefs, photographers, heart surgeons and janitors. This is a whole country that has moved.’

www.refugeecompany.com

and a Syrian refugee, Jay Asad, the start-up connects refugees with jobs, giving an otherwise idle population a chance to find ‘dignity through work, not handouts’ while they await their legal status, says Asad. As an example of this encouraging of entrepreneurship, Asad helped to set up a cheese factory in one refugee camp; the cheese maker is now trying to go into his own business.

A firm supporter of the project, ten Berge encouraged the Refugee Company to come to the Knowledge Mile. They currently work out of an office in the shared WeWork space and have a design studio in the Wibautstraat’s Student Hotel.

The Refugee Company was also approached by the Faculty of Digital Media and Creative Industries of the Amsterdam University of Applied Sciences, which was interested in working with refugees. ‘Everyone is interested in refugees. It’s the topic of the day,’ says Asad. ‘The school is designing an app to help refugees and we’re giving them feedback. For anyone interested in refugees, we can facilitate. We can also provide designers. It’s all about networking.’

Amstelhuis, a community for the elderly and another collaboration between the Knowledge Mile and the Amsterdam University of Applied Sciences, is a perfect example of a living lab. On the edge of De Pijp with a view east over the Amstel River, the privately-run Amstelhuis provides 120 small, private and affordable rental apartments to people 70 years and older. Its residents must be willing and able to care for themselves, but a shared library and club provide the social contact that according its founders is critical condition for happy living.

The students have made nine prototype apps for Amstelhuis residents, including one that enables them to invite people to dinner in their apartments or to request items from the shop. They also give iPad lessons to the seniors, teaching them how to Skype with their families and to navigate train travel. ‘We want to bring modern technology from the hogeschool to make people more independent,’ says Marry van Straten, former Project Leader in Urban Vitality at the Amsterdam University of Applied Sciences and currently the intermediary between the school and the Amstelhuis. ‘We aim to be a city friendly to all ages, and to do something for the city at the school. We have a lot of knowledge to give back.’

There are also Knowledge Mile collaborations with the business world: US conglomerate Bell Labs is, for example, using the Knowledge Mile to test its applications. And Dutch flagship airline carrier KLM is looking to develop smart data solutions with the Mile’s many ICT students. It’s a two-way street, says ten Berge: ‘Education programmes must adapt to a changing world and changing technology. Otherwise, they are educating children for jobs that will be extinct in a few years.’

Local businesses are also an essential part of the Knowledge Mile. Hartog’s Volkoren Bakkerij, an Amsterdam institution that has been baking whole-wheat bread since the 19th century, originally planned to grow grain in the Wibautstraat’s meridian strip, promoting a greener, healthier lifestyle and bringing residents closer to the food-production chain. The project was ultimately scrapped: although the wheat plants would have cleansed the air, helping to alleviate the street’s air pollution, the grain would have been too dirty to eat. Hartog owner Fred Tiggelman has already found a replacement project: a neighbourhood park where wheat can be grown with the help of the city’s children. ‘I think the Knowledge Mile is a beautiful thing,’ says Tiggelman. ‘It’s all about sustainability. A lot of new businesses are involved and they are all working in environmentally friendly ways.’

Initiative, connection – these are the buzzwords of the Knowledge Mile. There are high hopes indeed for what was formerly known as the ugliest street in the city. ‘The ambition of the Knowledge Mile is to become the smartest street in the world,’ says ten Berge.

‘Or at least in Amsterdam.’ <

‘You can find almost all the problems of a mid-size metropolis here on the Wibautstraat: air pollution, traffic, flooded metros, mobility issues’ (Matthijs ten Berge, Director, Amsterdam Creative Industries Network)


photo: Jordi Huisman


photo: Joppe Lauriks


photo: Maarten Noordijk


photo: Maarten Noordijk

clockwise from top: Matthijs ten Berge, the Wibautstraat by night, ten Berge on the Wibautstraat, interactive pavement, Creation Citizens


photo: Jordi Huisman

After a local school complained about the prevalence of scooters, The Knowledge Mile brought the relevant parties together to come up with a solution: a street tile for cycle paths that is integrated with light and audio sensors

The wet and wild history of Amsterdam science

Bridges are being built between academics, water authorities and the private sector in Amsterdam – a city historically constructed on water, and currently a rich fishing ground for innovations in the area of water science.

text **Steven McCarron**

When you think of Amsterdam, a few standard icons probably pop into your head: tulips, Rembrandt, cycling, perhaps cheese. But chances are it won't take long before water images flood your mind. After all, how many nations owe so much of their development and history to harsh battles with the elements as the Netherlands? Water is a key part of life in the country, and the centuries-old efforts to tame flood surges and reclaim land have also shaped the country's scientific community. This is why Amsterdam's water scientists are amongst the best in the world.

A strong core of today's research talent can be found at the University of Amsterdam's (UvA) Institute for Biodiversity and Ecosystem Dynamics and at the Vrije University Amsterdam's (VU) Faculty of Earth and Life Sciences, Institute for Environmental Studies (IVM) and Earth and Climate cluster. And as of 2015, a formal bridge has been built between these university communities: Amsterdam Water Science.

Initiated thanks to funding from the Amsterdam Academic Alliance, this new consortium forms a unified front to evolve the degree programmes, attract new students, drive funding for postdoctoral research positions and pilot projects, and build stronger connections with the City of Amsterdam, private businesses and water authorities.

Under the umbrella of Amsterdam Water Science, both the UvA and the VU have developed an exciting programme that pairs natural sciences (aquatic ecology, oceanography, eco-hydrology and meteorology) with social sciences (water economics and water governance). And while their research ties in with a wealth of international research projects, it's the water-rich landscape upon which Amsterdam has developed that serves as the ultimate testing ground for their research.

Key wetland areas

In practice, this means that the researchers and students are extremely active throughout the region.They take advantage of the natural and artificial landscapes that encompass key wetland areas in the province of Noord-Holland, in the Markermeer and IJsselmeer lakes, at the Port of Amsterdam and, of course, in those iconic canals in the heart of the city. Tackling projects from both the natural-science and social-science perspectives has resulted in ongoing themes such as applications of water management, benthic ecology, an economic perspective on peatland restoration and integrated monitoring for water quality.

'The local aim of our studies in the Markermeer is to understand the main processes that influence the ecological functions of this manmade lake,' explains Dr. Arie Vonk of Amsterdam Water Science, referring to aspects of the research being carried out on Amsterdam's doorstep. 'Even after decennia of lowered nutrient loads, the goals set for this "Natura 2000" area haven't been reached. Globally, many new lakes are being created in densely populated delta areas for reasons such as water security and flood protection, so understanding the main drivers of ecological development around Amsterdam can be exported to these international cases.'

Unsurprisingly, another of Amsterdam Water Science's key research topics is looking at how climate extremes can influence communities, and the measures government agencies and private companies can take

photo: Siebe Swart/Hollandse Hoogte

to manage the quality of water, flood risks and water shortages. Dr. Elco Koks has been busy with a collaborative project that is looking into the potential effects of extreme weather events on the port of Amsterdam and its supply chains.

Important 'what ifs'

Koks is quick to note that the Port of Amsterdam is one of the safest ports in the world, and that the probability of flooding is so low it doesn't even register on the risk matrixes of most companies. 'The project nevertheless looks at a wide variety of "what if" scenarios to analyse the potential impact of extreme weather events on businesses in the port,' he says. 'Could 20 to 30 centimetres of water disrupt supply chains? In Amsterdam, probably not. But as the Port and the City of Amsterdam aim to incorporate robust, climate-resilient designs into any new developments, these "what ifs" are important.' What's more, these models are applicable to other regions and international cities, and of great interest across different industries, from oil companies to data centres.

As well as working to evolve the university programmes at both the UvA and the VU, Amsterdam Water Science has initiated an annual symposium. Combining academic discussions held during applied sessions, the symposium brings together students with industry experts, professors and researchers. The success of the inaugural event tells its own story: seven out of eight presentations became funded projects, and Rijkswaterstaat (the organisation responsible for the main infrastructure facilities in the Netherlands) will co-organise the next AWS symposium in early 2017.

'What's great is that we're getting to cover all sides,' notes Amsterdam Water Science coordinator Dr. Roxana Petrescu, summarising the advantages reaped throughout the consortium's first year. 'Student participation is very important. We have an excellent education programme, so not only can we attract the best students, but we can grab the attention of businesses and stakeholders. And in turn we're bringing in some exceptional researchers who can write proposals, involve these students and even help to place them within companies. We're really dealing with the complete picture now.' <

'Understanding the main drivers of ecological development around Amsterdam can help other densely-populated delta areas' (Dr. Arie Vonk, Amsterdam Water Science)

The Amsterdam Water Science Consortium

- Launched in 2015 after being awarded start-up capital from the Amsterdam Academic Alliance (AAA).
- Its core research partners are the VU and the UvA, and there is collaboration with academic, commercial and non-profit stakeholders in Amsterdam and the rest of the Netherlands.
- Employs 110 researchers, and research takes place across a wide range of international projects in collaboration with leading universities in Europe, the USA, Asia and Australia. This is funded through 14 major research grants (ERC and NWO Vici, Vidi and Veni).
- Amsterdam and its water-rich environment serve as a testbed for the consortium's research and education. Three post-doc projects and seven pilot projects are currently underway.
- Within Amsterdam Water Science, future water scientists have access to two main aquatic education tracks: Limnology and Oceanography, and Hydrology. The latter has been named a national 'Top Rated Programme' for the second year running.

Planning, waste and water

The golden triangle

This Amsterdam collaboration 800 years in the making wants to change the way the world works with planning, waste and water.

text **Elysia Brenner**

'We are a city and a country of water,' says Kees van der Lugt, Regional Director of World Waternet, the company responsible for everything to do with water management in the greater Amsterdam region – from delivering drinking water to waste-water sanitation to the preservation of lakes and rivers. An overarching position unique in the Netherlands and most of the world. 'We can work more cheaply and efficiently,' van der Lugt explains. 'We can lay pipes for water and waste at the same time, for example. When repairs are needed, they're serviced by the same repairmen using the same processes.' However, van der Lugt and Waternet represent only one point on the 'golden triangle', a moniker the International Office of the City of Amsterdam uses to discuss one of the city's most essential collaborations with its foreign partners. In the triangle's other two corners are Evert Lichtenbelt, Strategic Advisor of Energy at waste-to-energy company AEB Amsterdam, and Eric van der Kooij, Team Leader of the Department for Physical Planning and Sustainability of the City of Amsterdam – working with other disciplines, such as mobility, when relevant.

800 years of expertise

'We are living in a delta below sea level,' van der Lugt continues. 'Water is our enemy and friend.' In the 13th century, when most of Europe was still under the feudal system, Amsterdam was working democratically. Building dykes and canals, creating polders (drained and reclaimed land), required cooperation, an open conversation seeking general consensus called the 'polder model'.

The city's collaborative, boundary-blurring 'Amsterdam Approach' to water

The Amsterdam Water Supply Dunes supply two thirds of the city's drinking water

projects goes back to the first dam in the Amstel, continuing through the enormous Golden Age Canal Belt project to today's Amsterdam Water Supply Dunes, a coastal nature reserve just south of Zandvoort that supplies Amsterdam with infiltrated water from underground and the Rhine River. Amsterdam water is not only pure, thanks to a lack of chlorine and other additives, but it's productive too. That's where AEB Amsterdam steps in with the world's most efficient waste-to-energy plant, recycling up to 99% of incoming solid waste. Waste water is used as a source of geothermal energy. Phosphates removed from the urine during treatment are used as fertilizer, and salt, gypsum, sand and other materials from the solid waste in construction. The energy released by burning the remaining sludge is harnessed for electricity and heating. 'Our partners keep finding more and more valuable new products and innovations,' van der Lugt says. 'This is how we keep costs down': Amsterdam water has cost one cent per litre for the past 100 years.

International ambassadors

International governments from Hanoi to Buenos Aires are making use of the golden triangle of expertise. Deyang, China, for example, is creating their own version of the Amsterdam dunes: the Jinan Wetlands Park, a climate- and earthquake-resilient drinking-water production system. Though Deyang is currently smaller than Amsterdam, the population is expected to expand to one million in the next five years.

'In terms of planning, China is experiencing a rapid growth beyond any Western city,' van der Lugt says. 'However, despite the size differences, the challenges are mostly comparable, as are the solutions. The scale and design just need to be adjusted.'

Removing barriers

One thing Amsterdam seems to have in common with many Asian cities is the government involvement in city improvement. This is one of the strengths of the Amsterdam model of urban management, according to the golden trio. For example, the city's 'erfpacht' system of land ownership, where 80% of home owners lease their land from the city for 49 or 99 years. 'This system provides structured, long-term income,' van der Lugt explains, 'giving the city the ability to improve infrastructure, even in hard economic times.'

'It's important to make new urban designs water-resilient,' van der Lugt adds. For example, designs for IJburg and the other newly built islands of Amsterdam incorporated rain-water storage on roofs and in public spaces. Flood-proof design before the flood.

However, Amsterdam is still learning. Says van der Kooij, 'We can learn from the quick decision making in the world's fastest-growing cities. We sometimes have a tendency to put off taking action.' Adding, 'Of course, looking at other cities we also see what Amsterdam does really well. We work with governments where no one is collaborating at all. The first challenge is to get people around a table. This isn't a problem in Amsterdam.' <

Merchant power

Amsterdam's meetings industry continues to grow, supported by a merchant spirit 400 years in the making

text Matt Farquharson

Beurs van Berlage (photo: Igor Roelofsen)

MEETINGS & CONVENTIONS

Tower point presentation

As a famously flat destination, when you do get up high in Amsterdam, your views are uncluttered by hills or mountains. Two of the city's tallest conference destinations sit riverside and offer dramatic views. Perched above the Amstel, the Rembrandt Tower Boardroom, 36 floors up the eponymous tower, has perhaps the most remarkable vista in the south of the city.

'Other than the view, another advantage is you can screen who comes into your meeting,' says Horsmans. 'If it's a high-level government person, you can literally seal off the lobby and be very safe up in the sky, undisturbed. They're truly beautiful boardrooms, with the highest quality service.'

At the opposite end of the city, both in style and geography, A'DAM sits on the north shore of the IJ River. The open-air viewing deck on the 22nd floor has 360° views, as does the revolving restaurant two floors below.

'A'DAM is short for Amsterdam Dance and Music, and to reflect the music DNA of the city, it has lots of entertainment areas and lounges and a club downstairs. Some of the floors are dedicated to music-industry offices and there's a penthouse, a hotel called Sir Adam and meeting rooms,' says Horsmans.

www.rtboardroom.nl
www.adamtoren.nl

The grand dame

Perhaps the grandest of Amsterdam's grand hotels, the Amstel Amsterdam has hosted high-falutin' visitors since it opened in 1867. The Dutch royals have been known to bed down here when in town, and it was taken over by Qatari group Katara Hospitality in 2014. It is also home to La Rive, one of Europe's finest restaurants and proud recipient of one to two Michelin stars each year since it opened.

'It was an icon in the time that it was built, and it's still here,' says Horsmans. 'It really appeals to a lot of people, not only for the top layer who can afford to come and stay there, but it also opens up the doors to other conference delegates that may not have a budget to come and have a meeting there, but they are welcome to go there for side events, and for meals, or drinks. Of course, in the summer time, it's lovely to be out on the wonderful terrace and just enjoy Amsterdam at its best, when the boats are floating along the Amstel River.'

www.amsterdam.intercontinental.com

The Dutch invented capitalism. Or at least, they invented its modern guise when, in 1602, the first stock exchange opened in Amsterdam and the Dutch East India Company became the first firm to issue stock. It is now regarded as the original multinational corporation.

The event marked the beginning of a century of Dutch pre-eminence as a merchant nation: a tiny land built up from mudflats to global dominance by the benefits of trade.

Today, the building where those first stocks were traded still exists, a three-minute walk from Amsterdam's Central Station.

But the Beurs van Berlage former stock exchange no longer deals in equities. In some ways it has reverted to a more ancient kind of trade, bringing people together as a conference centre.

THE PEOPLE INDUSTRY

'Our merchant spirit is something really positive and it continues today,' says Marc Horsmans, Meetings and Conventions Manager at Amsterdam Marketing.

'That merchant spirit is to the advantage of conference organisers because conferences are a people industry. So it helps when the local people do day-to-day business with each other and cooperate very willingly on trade. This has to do with the Amsterdam merchant spirit: do as normal, but run your business and do it very well. In other words: just do your work.' Along with capitalism, the Dutch are masters of plain speaking.

Amsterdam has been a popular conference city since the opening of an exhibition centre in the late 1890s that would go on to become the RAI in the century to follow (see box); and last year, nearly 2,600 international conferences and exhibitions took place with over 1.2 million participants.

The city's prominence in life sciences, finance, technology and IT start-ups means that those industries have been particularly keen to host events here, and the city works hard to offer local expertise to conference organisers. Once the theme for a conference is set, the supporting team at Amsterdam Marketing can tap into the knowledge of the local government, science centres or companies to help gather useful information and offer ideas and potential partners.

LABEL OF QUALITY

Over the last decade, a surge in the number of hotel rooms and new venues has seen the supply of space catch up with the sometimes overwhelming demand. Since 2006, hotel capacity in the city has increased by 50%.

'Now we have nearly 38,000 rooms and we're going to grow to nearly 40,000,' says Horsmans. With that surge in beds, the city has been very keen to ensure standards remain up to scratch, implementing a system called Iamsterdam Approved.

'With so many hotels under development, conference organisers were concerned that hotels would squeeze the hotel rates higher at busy times,' says Horsmans. To get Iamsterdam Approved status, hotels must fall within a set price and quality range.

'A three-star hotel has a different rate than the Amstel Hotel, which is a five-star deluxe, but they're all within a certain range. It's a promise to conference organisers: "If you come with a huge amount of people, we're not going to ask the highest hotel rate." Hotels understand the long-term investment, and they work with us.

clockwise from top left: the Hoxton (photo: Alan Jensen);
Marineterrein (photo: Siebe Swart);
Westergasfabriek (photo: Arjen Veldt);
Rode Hoed (photo: Barbara Kieboom

A'DAM lookout

I'm proud that the city can cooperate with all its conference stakeholders like that. It is really very unique,' says Horsmans. It's part of a service ethic has seen high-end offerings such as Concierge Amsterdam (see box) blossom in recent years.
And the creative nature of the city has helped to attract suitably creative hotel chains. The city's first W Hotel opened at the end of 2015, a few months after the first overseas outpost of East London hipster chain The Hoxton, with a Soho House – the members' club for the creative industry – coming in 2017. Budget design hotel chain Motel One opened its first Amsterdam site last year, while local invention the Arcade Hotel pitches itself to the city's impressive gaming industry.

UNIQUE VENUES

Along with the growth in the number of hotel rooms, new meeting locations are coming. All that Golden Age merchant wealth created some impressive architecture, and much of it is becoming available to conference organisers under the banner of Unique Venues Amsterdam (uniquevenuesofamsterdam.com), alongside the glass and steel modern marvels sprouting from the shores of the IJ River behind Central Station.
'There are buildings that have shifted their focus to the convention industry very happily – for example, the Beurs van Berlage, and also Amsterdam ArenA, which used to be just a soccer stadium but now has thousands of square meters dedicated to the meetings industry. Other funky buildings, like the Rode Hoed along the Keizersgracht, have really adapted to the meetings industry.' See the boxes here for some of the more remarkable venues.
And, being Amsterdam, all of these places are very close together. This is a city where it's possible to cycle across the centre of town in 15 minutes, and where global HQs for firms as diverse as Heineken, Philips, Tommy Hilfiger and an array of financial and scientific institutions are just a few minutes apart.
'Amsterdam is a very compact destination, but that isn't just about getting from A to B in five minutes by bike; it's also about people knowing each other,' says Horsmans. 'In many other destinations there are layers of politics, but you don't find that in Amsterdam. That helps conference organisers, because you need to know that if something goes wrong, you can trust it will be handled quickly and in a professional way. And the pragmatism of the Amsterdam people is of course there to support that.'
Those people, ultimately, are what Horsmans sees as the city's main competitive advantage.
'Amsterdam doesn't really hold any big industries. We don't make thousands of cars a day. We're not an industrial city like that. The people are the industry, and that makes a bit of a difference,' he says. 'That makes Amsterdam very unique: that merchant spirit that has been in our DNA for over 400 years'. <

At your service

'The touristic climate in Amsterdam is changing as we gain more five-star hotels,' says Bojana Duovski, founder of Concierge Amsterdam. Her firm has been at the forefront of that change since launching in 2006 to offer concierge services to the city's visitors and locals. Amsterdam now has 15 five-star hotels, and the service ethic to go with it.
'Everything is based on the client's personal requirements and wishes. We have nothing pre-set,' she says. Concierge Amsterdam's team of 12 arrange tables at hard-to-book restaurants, organise bespoke tours and trips and generally cater to whatever whims and fancies customers have.
'We have one client who always wants his hotel suite to have the same scent as his home, so every time he comes we make sure his hotel suite has that scent,' she says.
'We had another client flying by private jet from the Med, and on the flight his friends called to invite him to a safari in Tanzania. He made a stop in Amsterdam and they called us to repack his suitcase. We bought all his gear for the safari and had a private fitting in his hotel suite and the next day he flew to Tanzania.'
But Bojana is eager to add, 'It's not only for rich or famous people: it's for people who want something special in our city.'
www.conciergeamsterdam.nl

The big hitter

RAI Amsterdam is the city's biggest conference venue, and the site has held exhibitions since 1895. The current RAI was opened in 1961, but has been undergoing significant upgrades in recent years.
'They have created something very modern', says Horsmans, 'a place that brings people together in the physical and virtual worlds, crossing borders and providing inspiration.'
'There are many cities in Europe that have conference centres, but ours is walking distance from their hotel and world-class restaurants. It means you can engage in the meetings, and be in the conference bubble, but you are also able to enjoy a bit of the city.'
It covers 87,000 m2 and now has 11 halls, 22 conference rooms and enough restaurants to feed 3,000 hungry delegates at once. An on-site hotel (Nhow) is on the way.
www.rai.nl

AMS IN NUMBERS

>2,700

The number of foreign companies that the Amsterdam Metropolitan Area is home to.

(Source: amsterdam inbusiness)

140

New foreign companies opened in 2015.

(Source: amsterdam inbusiness)

2,953

Estimate of new jobs provided by these new companies in three years.

(Source: amsterdam inbusiness)

International influx, top 5

Country	Companies*
US	47
UK	15
China	15
Japan	11
Turkey	8

(Source: amsterdam inbusiness)
*Number of companies from that country in the Amsterdam Metropolitan Area

Key sectors

	New companies	Jobs
IT & Tech	36	769
Financial & Business Services	23	420
Creative Industry	15	367

(Source: amsterdam inbusiness)

#1 in innovation

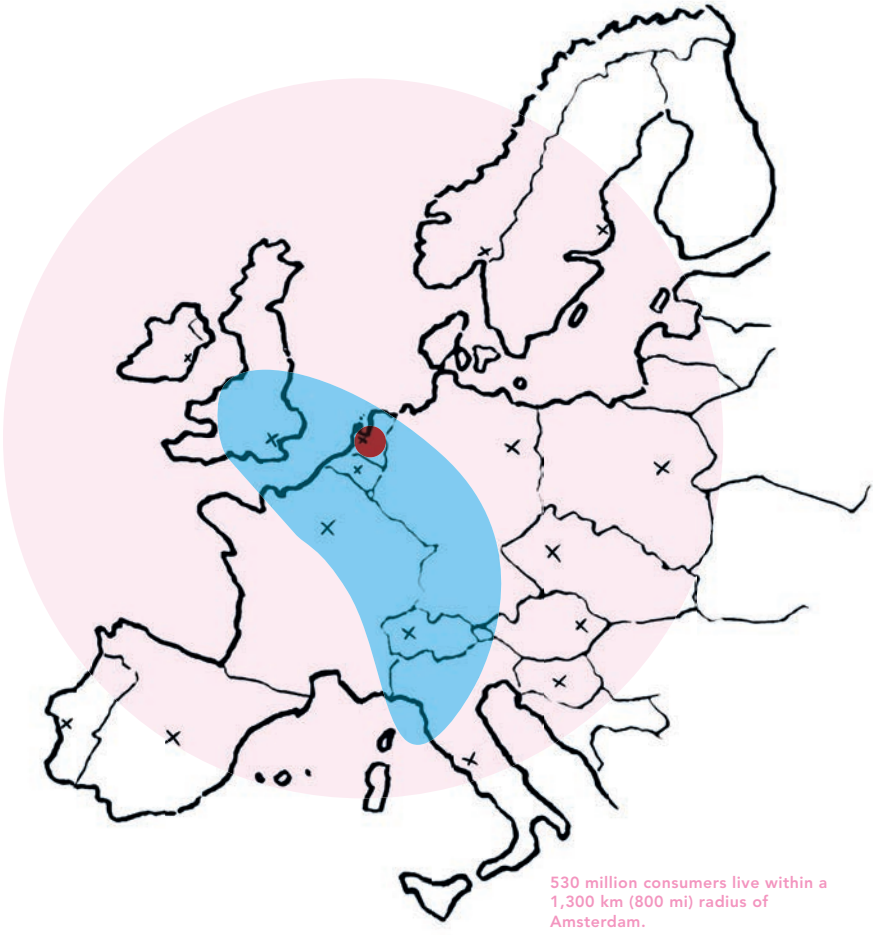
On 8 April 2016, the City of Amsterdam was named the European Capital of Innovation (the iCapital award) by the European Commission. The award panel, consisting of independent experts, praised the way Amsterdam embraces a bottom-up approach based on smart growth, start-ups, liveability and social innovation.

(Source: European Commission)

A creative force

'While ad agencies can be found in any major city, Amsterdam has prospered as marketers followed companies setting up European headquarters in the Netherlands.'

(Source: *Bloomberg Business*)



530 million consumers live within a 1,300 km (800 mi) radius of Amsterdam.

The 'blue banana' shows the European economic heartland (50% of European GDP).

77 new marketing and sales offices and **42** head offices opened in the Amsterdam Metropolitan Area in 2015.

(Source: amsterdam inbusiness)

AMS IN NUMBERS

Safest cities

City	Rank
Tokyo	1
Singapore	2
Osaka	3
Stockholm	4
AMSTERDAM	**5**
Sydney	6
Zurich	7
Toronto	8
Melbourne	9
New York	10

(Source: Economist Intelligence Unit, Safe Cities Index 2015)

FIRST

'Amsterdam is #1 – outranking Berlin and London – in the available pool of qualified labour and in quality of life.'

(Source: *Forbes*)

Best cities in Europe for digital start-ups

City	Rank
London	1
AMSTERDAM	**2**
Stockholm	3
Helsinki	4
Copenhagen	5
Paris	6
Berlin	7
Dublin	8
Brussels	9
Munich	10

(Source: Nesta, European Digital City Index 2015)

International talent

The Expatcenter Amsterdam assisted more than 10,000 internationals in 2015, this respresents a growth of 26%. In reviews, the centre's services scored an average of 8.6.

(Source: the Expatcenter Amsterdam)

Worldwide ranking, attracting foreign direct investment

City	Rank
London	1
Paris	2
AMSTERDAM	**3**
Singapore	3
Shanghai	5
Chicago	6
Dubai	7
Bangkok	8
Barcelona	9
Istanbul	10

(Source: IBM, Global LocationTrends Report 2015)

Sustainable Cities

City	Rank
Frankfurt	1
London	2
Copenhagen	3
AMSTERDAM	**4**
Rotterdam	5

(Source: Arcadis, Sustainable Cities Index Report 2015)

25 Average number of nationalities employed by the 50 most culturally diverse companies in the Amsterdam Metropolitan Area.

(Source: amsterdam inbusiness/Expatcenter 2016)

4 reasons why foreign businesses choose to settle in the Amsterdam Metropolitan Area

1. Gateway to Europe, with a strong business ecosystem and easy access to the continent
2. Quality of life
3. Excellent cost/quality balance
4. Thriving technology hub, with outstanding digital connectivity

(Source: amsterdam inbusiness 2016)

KLM makes new connections

Being wherever your customers are is vital for any airline, and KLM is no exception. Which is why, this summer, KLM is adding a large number of new destinations to its network

text Frido Ogier
photography KLM/MAI & KLM

Ever since it was founded in 1919, KLM has sought out new routes to connect people around the world. Before WWII, the airline's focus was mainly on the East, and within five years of its formation, KLM was operating flights to the (then Dutch) East Indies. For a long time, this was the world's longest international route, and it shared major similarities with the Silk Road. Not only was the journey by plane significantly faster, but the multitude of stops en route opened up speedier connections with places that, until then, had only been accessible overland.

AN INTRICATE NETWORK

The economic welfare of a city or region can be developed and promoted with the aid of a thriving aviation sector. KLM's intricate European network and its intercontinental network combine to provide numerous transfer opportunities via its hub at Amsterdam's Schiphol Airport. This makes the Netherlands easily accessible for many commercial passengers from around the world and an attractive place to establish business.

Working closely with partners has always been important to KLM. Partners provide added value and enable customers to access a far larger network than any single airline could offer on its own. Where you cannot go yourself, find a partner who can: KLM has been benefitting from this approach since the 1920s, working with airlines around the world to provide an unparalleled global network.

KLM's strategic partner, Delta Airlines, ensures there are good connections from Schiphol Airport to and within the US and Canada. But that's just the beginning. The Indian airline Jet Airways recently became a partner, which has improved access to destinations in India and the surrounding countries and, as a result, significantly increased the appeal of KLM's network. There are, of course, many other airlines – in China, South America and Africa, for example – with whom KLM has strategic partnership agreements. Together, KLM and its partners offer a total of 192 destinations, 113 of which are in Europe and with 79 intercontinental connections. Of these, KLM operates 144 routes itself.

NETWORK EXPANSION

Yet there are always opportunities to grow, and this summer, KLM is expanding its European network in particular. Capacity that is not fully used on some routes can be better deployed elsewhere and, with this in mind, one of the airline's new destinations, Ibiza, will be offered for six weeks only. This meets precisely the aim of 'being where the customer wants you to be' (when your customer wants you to be). Ibiza was an obvious choice, but there are also other seasonal destinations such as Genoa, Valencia and Alicante, and KLM will operate services to these destinations in the summer when demand is highest.

Access to Schiphol Airport from the UK is also being enhanced with the addition of Inverness and Southampton, bringing the total number of UK destinations to 16. Furthermore, Dresden is the 10th destination in Germany now served by KLM, and intercontinental newcomers to the network are Salt Lake City in the US and Astana in Kazakhstan. These new business destinations offer significant potential in regions that have strong commercial opportunities.

And when it comes to business, KLM's intricate network ensures that the Amsterdam region and Schiphol Airport thrive as a hub. Around 30,000 KLM employees and their families, as well as another 290,000 or so other people, are dependent on aviation in the Netherlands for their livelihoods.

Whether it's careers or destinations, it's fair to say that KLM connects. <

70 years to New York

This year marks the 70th anniversary of KLM flights from Amsterdam to New York, a destination that KLM is proud to have been the first European airline to serve. After the end of WWII in 1945, KLM's president Albert Plesman set about developing KLM as quickly as possible. Bomb craters at Schiphol were filled, and even though the airport's buildings consisted of a collection of wooden barracks, the airport was soon operational again. In the context of this post-war dynamism, KLM re-established its route network and expanded it wherever possible.

The focus was suddenly more westwards than it had been before, and the US was an important part of this. Landing rights in the US and Glasgow had to be arranged and the organisation of these did not go off without a hitch. But, finally, trial flights coud be carried out on the new route to New York via Glasgow and Gander (Newfoundland). On 21 May 1946, everything was set and DC-4 *Rotterdam* took off for New York, and in so doing opened up the US for the Netherlands and its European network.

It was an instant success, with 6,503 passengers flying the route in 1946. As a result, an extra 33 flights were added to the schedule.

PARTNERS

amsterdam economic board

The Amsterdam Economic Board sustainably enhances the prosperity and well-being of the Amsterdam Metropolitan Area by working with businesses, local governments and knowledge institutes, focusing on collaboration, innovation and growth.

Ambitions for 2025

The Economic Board works with partners on smart solutions to the urban challenges of the future. This is necessary to secure the highest quality of life for the citizens of the Amsterdam Metropolitan Area – this is the overarching goal. For the next few years, the focus is on the following five ambitions:

- **Health:** In 2025 inhabitants of the Amsterdam Metropolitan Area will have added two healthy years to their life-span.
- **Mobility:** All urban traffic will be emissions-free by 2025.
- **Digital Connectivity:** In 2025, the Amsterdam Metropolitan Area will be the top place in Europe for data-driven innovation.
- **Circular Economy:** In 2025, the Amsterdam Metropolitan Area will play an exemplary role in finding smart solutions for shortages in raw materials.
- **Jobs of the Future:** By 2025, the Amsterdam Metropolitan Area will be the most adaptive and attractive environment for job opportunities in Europe.

To the top

'We aspire to be one of the top three most innovative regions in Europe by 2025. Achieving this will not only make our region healthier, greener and smarter, but it will show the world how a metropolitan area can handle urban challenges in an innovative way. The ambitions are great, but through cooperation and big thinking, we are convinced that we can make it happen.'
(Eberhard van der Laan, Mayor of Amsterdam)

Urban challenges

Our goal is to successfully address five urban challenges: health, mobility, digital connectivity, circular economy and jobs of the future. The Amsterdam Metropolitan Area is in a position to excel in these areas on an international level because so much potential is already at hand: a dense network of innovative businesses, extensive academic knowledge and a reliable physical and digital infrastructure. Moreover, innovation is stimulated both top-down by a co-operative government and bottom-up by a great group of committed citizens.

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Amsterdam Economic Board

What does the Board do?

In solving these urban challenges, the Amsterdam Economic Board unites innovators, helping these parties by:

- Signalling opportunities for innovation regarding these challenges
- Forming consortiums of cross-sectorial partners for innovative projects
- Offering access to regional and international networks
- Creating physical and virtual meeting points (for example, via events and online platforms)
- Providing data-driven information regarding these challenges
- Offering inspiration

Startup
Amsterdam

With the StartupAmsterdam action programme, the Amsterdam world of start-ups and the City of Amsterdam have joined forces to make the Dutch capital Europe's leading location for start-ups.

StartupAmsterdam, in brief

Founded by serial entrepreneurs and governmental bodies, StartupAmsterdam helps entrepreneurs discover everything the start-up capital of Europe's west coast has to offer. The programme is a public/private initiative; collaboration between sectors is vital for its success. With its partners, which include accelerators, academic institutions, investors, large companies and start-up founders, StartupAmsterdam creates a visible and coherent start-up ecosystem.

It encourages international start-ups and tech talent to establish links with Amsterdam, and helps those already here to expand globally. StartupAmsterdam focuses on start-ups for whom technology forms a fundamental part of their products and who have the ambition to achieve rapid international growth. The program is based on five pillars that a start-up needs in order to succeed: talent, users & customers, content, capital and the environment.

Events & networks

The Corporate Partner Programme
With the Corporate Partner Programme, StartupAmsterdam encourages corporations to become more involved by connecting them to initiatives in the start-up community that are relevant for their strategic goals.

The Launchpad Network
Corporations agree to act as launching customers, lead users or early adopters, offering up their network to help start-ups grow in the Netherlands, throughout Europe and beyond. Several events, such as Launchpad Meetups, are already in place to spark new connections.

Amsterdam Capital Week
During the week of 26-30 September 2016, Amsterdam Capital Week will provide more than 2,000 start-ups from around the world with access to over 500 investors. Now in its second year, this dedicated week features events during which angel investors, venture capitalists and (crowd-) funding organisers open their doors to start-ups.

Amsterdam's three advantages

When it comes to start-ups and scale-ups, Amsterdam boasts three advantages:

- It is the continent's best testbed, with an abundance of lead partners, launching customers, early adopters and a diverse open-minded population.
- It is a global launchpad, with international relations extending to start-up hubs around the world, a strong Launchpad Network in place and one of the best airports in the world.
- It has a large talent pool, educating and attracting the best engineers from all around the world. This is illustrated by numerous initiatives, such as Amsterdam Science Park, Amsterdam Excellence Track and B. Startup School Amsterdam.

Find out more
#StartupAMS
StartupAmsterdam
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PARTNERS

Netherlands Foreign Investment Agency

An operational unit of the Dutch Ministry of Economic Affairs, the NFIA is your first port of call, connecting you with a broad network of business partners, regional economic development organisations and government institutions to facilitate your international expansion.

Your one-stop shop for success in the Netherlands

Whether you're considering locating to the Netherlands or have existing operations here, the Netherlands Foreign Investment Agency (NFIA) will assist your company at every stage of establishing or expanding operations in the Netherlands. Free, confidential services offered by NFIA include: organising fact-finding missions, arranging meetings with relevant partners and providing personalised guidance and counsel on tax, government and permit procedures; location options and business solutions.

Success stories

Throughout the years, NFIA has helped thousands of companies from all over the world – companies such as Bombardier, Cisco, Danone, Fujifilm, Huawei, LG Electronics, SABIC, RWE and Tata Consulting Services – to successfully establish their business in the Netherlands.

Advocacy

The NFIA is prepared to advocate with national and EU governments on your company's behalf to help you streamline the set-up and/or expansion process in the Netherlands.

Fact finding

The NFIA rolls out the orange carpet to provide your company with everything it needs – from introductions to relevant business partners and government authorities to personalised information on incentives and business solutions – to locate pan-European operations in the Netherlands.

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expatcenter amsterdam

Opened in 2008, Amsterdam's Expatcenter cuts through the bureaucratic red tape for the Amsterdam Metropolitan Area's growing number of international companies and their migrant employees.

What the Expatcenter can do for you

Amsterdam's appeal lies in its rich cultural heritage, creative culture, commercial dynamism and high quality of life. Ultimately, however, the city's greatest asset is its people, a healthy – and growing – percentage of whom are international.
The Expatcenter was one of the first Dutch agencies to cut the red tape for internationals, drastically streamlining relocation procedures and helping them settle in. Seven years later, the Expatcenter offers a comprehensive range of services. Working with its partners from the I amsterdam portal site, the Expatcenter continues to expand its digital support for Amsterdam's international community, for both work and play.
Partnerships – with banks and childcare providers, movers, lawyers, language schools and more – mean the Expatcenter has the tools to make an international's first few months a little smoother. Because the first step of a journey doesn't have to be the most difficult one.

Welcome to Amsterdam!

Residence permit for entrepreneurs

As of 1 January 2015, a new regulation allows ambitious entrepreneurs to apply for a temporary residence permit for the Netherlands. The so-called 'scheme for start-ups' gives entrepreneurs from outside the EU one year to launch an innovative new business in the Netherlands. Under the scheme, new international start-ups will be offered the necessary support to develop into mature enterprises. This scenario is not only beneficial for the entrepreneur but also creates a solid foundation for job creation and economic growth in the Netherlands. www.iamsterdam.com/startup

One-stop shop for employees

- The Expatcenter services international companies and their migrant employees across the Amsterdam Metropolitan Area.
- The Expatcenter is a joint initiative of the cities of Amsterdam, Amstelveen, Haarlem, Haarlemmermeer, Almere, Hilversum and Velsen, along with the Immigration and Naturalisation Service (IND) and the Tax Office.
- Employers can use the Expatcenter to initiate residency applications before a new employee even arrives in the Netherlands.
- Fast-track services mean qualifying internationals can begin work as soon as two weeks after their employers apply to the IND.
- In one appointment, employees can collect their residence permit and register with their municipality. This will provide them with a citizen service number (BSN), allowing them, for instance, to open a Dutch bank account.
- Following an agreement with the Dutch Tax Department in 2011, applications for the employee 30% tax ruling can now be made via the Expatcenter.
- The Partnership Programme, created in 2009, connects internationals with service providers focused on their needs.

The numbers

- Over 850 international companies and their international employees make use of the Expatcenter's services
- Over 850 new internationals visit each month
- Clients rate the services provided by the Expatcenter an excellent 8.6/10 on average
- More than 47,000 internationals have visited the Expatcenter for registration assistance

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amsterdam business

The official foreign-investment agency of the Amsterdam Metropolitan Area, amsterdam inbusiness provides free, active support and independent advice to organisations planning to invest or settle in the region.

amsterdam inbusiness in brief

amsterdam inbusiness is the official foreign-investment agency of the Amsterdam Metropolitan Area (a cooperation between Amsterdam, Amstelveen, Almere and Haarlemmermeer). The agency assists foreign companies in establishing and expanding their activities in the Amsterdam area. They can help you create a convincing business case for setting up by offering practical advice and relevant information. And it's all free, strictly confidential and without obligation.
Their commitment does not end once you have set up operations. They strive to build a long-term relationship, supporting you in every phase of your company's development. Considering setting up your business in the Amsterdam Metropolitan Area? Don't hesitate to contact them. They (and we) look forward to welcoming you in Amsterdam!

Customised solutions

By combining your data with ours, we can provide you with relevant information for your organisation. Our services for organisations planning to set up in the Amsterdam Metropolitan Area include:

- **Market Intelligence**: providing specific data on markets, industries and sectors in, for example, IT, financial services, media, advertising, life sciences, food, gaming, aerospace and logistics.
- **Investment-climate intelligence**: providing information about Dutch laws, regulatory and fiscal frameworks, the labour market and available incentives, and developing independent benchmark reports on salary levels, office rental costs, cost of living, etc., for your European-location and/or supply-chain information gathering.
- **Fact-finding visits**: tailor-made fact-finding programmes keep you informed about the market, the availability of talent, the business climate and the quality of service providers, including visits to office locations.
- **Talent**: tapping into the labour market via introductions to recruiters and/or networks and communities of professionals.
- **Business & partner networks**: introductions to strategic partners, business networks/associations, knowledge institutions, tax authorities, governmental agencies and, when possible, potential clients.
- **Relocation support**: assistance in search and selection of temporary, flexible and permanent office space, including site visits and tours.
- **Support for international staff**: apartment search for expats (short/long stay), introductions to international schools, expat clubs and referrals to doctors, dentists, accountants, etc.

The numbers

- Over 2,700 international companies are located in the Amsterdam Metropolitan Area
- In 2015 we welcomed 140 new foreign companies in the Amsterdam Metropolitan Area

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