



Building a world-class community of climate innovators

PROGRESS TOWARDS OUR STRATEGIC OBJECTIVES | 2012/13



Chairman's overview

Envisioning the world's third industrial revolution

Human civilisation might be compared to a multi-stage rocket. In the 1770s we fired the first stage, driven by coal, steam and mechanisation. During the 1940s the US Bell labs began developing the transistors that triggered the second industrial revolution in the '70s. Now it's time to envision a third industrial revolution – towards a sustainable economy based on renewable energy.

If we continue with business as usual, earth will be warming by up to 4°C by the end of this century – far more than the two degrees above pre-industrial levels that, according to most climate researchers, would arguably avoid most risky impacts. Even this relatively low level of global warming would lead to substantial sea level rises for hundreds of years. With unabated climate change, crop yields would be at risk in many regions, ecosystems would change, and cities would face more heatwaves. So this is not about green luxury – it's about the fundamentals of people's livelihoods.

That's why we need to transform our industrial metabolism. Energy grids, transport, housing, recycling, carbon management, urban planning, water availability – all these sectors need new thinking. These challenges must be met if we want to leave our children's children a planet as habitable as the one we inherited. Europe can lead the way in tackling these challenges, and Climate-KIC is positioned as an engine for innovation in these vital areas.

John Schellhuber,
Governing Board Chair, Climate-KIC

Eight key climate challenges drive everything we do

In 2012 we redefined the eight climate change challenges or themes framing all our activities.

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Chief Executive Officer's introduction

A community that enables innovation to flourish

Over the last year, our Climate-KIC European community has grown stronger and wider, with over 180 partners encompassing business, academic, non-government and governmental sectors, and anchored in 12 hubs across the continent. We have focused our business strategy on eight major climate change challenges where Climate-KIC has the expertise to have a key impact on climate change – not only on mitigation but also, since climate change is already happening, on adaptation.

To realise the vision of a third industrial revolution – towards a sustainable economy – we should work in new ways. Innovation must be systemic and must work across borders – across discipline, sector, geography. We must bring together business, entrepreneurs, research, education and government. We must link demand-side challenges with supply-side innovation. To do this we must be smart.

We have therefore created our unique innovation community where partners can work in a synergistic way to develop the people, products and services to address climate change. By working together as a community with shared social and commercial goals we can achieve much – you can see some of the results in this review.

Mary Ritter, Chief Executive Officer



Climate-KIC has over 180 partners across business, academic, public and non-profit realms

- 1 Greenhouse gas monitoring** | Measuring greenhouse gases in support of climate change mitigation
- 2 Adaptation services** | Increasing the ability of cities, societies and infrastructures to adapt to climate change
- 3 Making transitions happen** | Creating the low-carbon culture that inspires companies, communities and citizens to reduce their impacts and to connect globally on the climate change challenge
- 4 Sustainable cities** | Moving towards decentralised and integrated energy, waste and water utilities and more sustainable transport systems
- 5 Built environment** | Creating energy-efficient, low-carbon structures, and 'retrofitting' old ones
- 6 Land and water** | Supporting the adaptation of water engineering and agriculture to climate change and linking it to better land use and ecosystem services delivery
- 7 Resource efficiency** | Boosting efficiency by turning waste, including food waste and carbon dioxide (CO₂), into a resource
- 8 Developing a bio-economy** | Supporting the transition to a bio-based economy to reduce our carbon footprint

Who we are

Drivers of climate innovation in Europe and beyond

Launched in 2010, Climate-KIC is one of three Knowledge and Innovation Communities set up by the European Institute of Innovation & Technology (EIT).

Our mission is to spark and deliver innovative solutions to climate change via a dynamic alliance of European partners drawn from academia, industry and the public sector.

Our vision is to provide the people, products and leadership to confront the climate challenge globally. In driving innovation for climate change mitigation or adaptation we help shape the world's next economy.

Across Europe we have five co-location centres or 'innovation factories' led by world-class universities and companies. Our six regional innovation communities, which are led by local or regional government, support the testing, implementation and scaling up of innovation.

Having begun 2012 with 95 partners, Climate-KIC now has an integrated community of more than 180 partners. Of these, 47 per cent are from business, 32 per cent are from academia, and 21 per cent are public bodies.



Climate-KIC now has 12 business activity hubs across Europe



What we do

Connecting research and technology with business

Climate-KIC links research, technology and business to find ways of mitigating or adapting to climate change and accelerating the solutions to market. Our business model has three areas of expertise.

In **innovation** we identify and develop the market potential of emerging technologies, creating new products, services and jobs in Europe with a global impact on climate change.

In **education** we recruit, nurture and develop entrepreneurs to become agents of change. Our courses combine climate change science and entrepreneurship with a practical programme of learning-by-doing featuring real-life challenges and innovation projects.

In **entrepreneurship** we open up the market for small businesses and start-ups working in the area of climate innovation, providing the opportunities and practical tools to turn ideas into commercial success.

How we work

Bringing together the top climate change thinkers

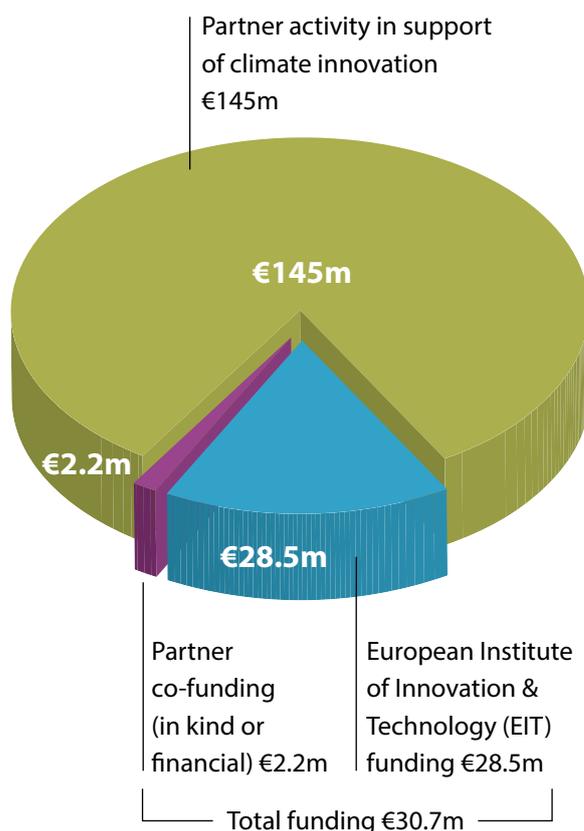
Climate-KIC is the only pan-European network that both confronts the climate change challenge and generates prosperity in Europe and beyond.

We bring together the most influential and commercially minded climate change players to create a world-class community that generates real solutions, real jobs, real products and real services.

We do this in our three areas of expertise – education, innovation and entrepreneurship. And we do it with purpose and passion. Climate-KIC partners not only benefit from opportunities to work alongside the best thinkers in the climate change space – they also gain an important sense of belonging.

On these pages we showcase some of the 2012/13 projects and activities that demonstrate how we work with corporate and academic partners, entrepreneurs, and start-up businesses. This is where our funds are directed. These are the people and programmes that benefit from our support.

Climate innovation income and funding 2012



Performance highlights 2012

What we achieved across our key areas of expertise

Overall | Over 180 partners across 4 sectors: 46% business, 29% academic, 25% public or not-for-profit | 12 hubs across Europe | **Business strategy** | 8 themes of climate change established and designed to address the societal challenges facing Europe | **Communications strategy** | Clear vision, mission and values, brand guidelines and digital strategy established

Innovation | 27 projects creating innovative products and services to tackle climate change | 10 services or products launched into the marketplace | 14 examples of knowledge transfer or adoption within the community | 3 business start-ups | 11 policies or standards co-developed | 58 publications

Education | 31 programmes across 7 universities in 3 countries received the EIT Climate-KIC label | 174 students recruited at Masters level | 67 PhDs recruited | 20 business ideas being developed in the 'Greenhouse' | 6 pilot professional education courses delivered in London, Berlin, Hessen, Budapest | 8 *theJourney* schools hosting 350 young professionals and postgraduate participants | 4 SPARK! lectures across the Netherlands, Switzerland, France and the UK centres | Climate-KIC Alumni Association founded under Dutch law with 500 members

Entrepreneurship | 172 sector and boundary crossing pioneers are now part of a 300-strong network | 74 new business ideas incubated | 20 SMEs received vouchers for specialised business support | 4 Climate Market Accelerator pilots | 10 matchmaking events to attract the best climate entrepreneurs | Climate-KIC incubator network started with 11 incubators across Europe | Climate-KIC Venture Competition, and Open Innovation Slam | Sustainable airports event

Communication & community | Climate-KIC brand guidelines and templates created | Climate-KIC social media channels established | Video conferencing facilities implemented across 12 European offices | Internal communications channel, the community hub, development started | Partnership strategy created and being implemented



Strategic outlook 2013

Our principal targets and objectives for the year ahead

Fostering climate innovation and entrepreneurship | 100 business ideas incubated | 30 products or services launched | 15 transfers of expert knowledge between partners | 45 business start-ups created | 175 jobs created | Develop and implement 15 policies or standards

Addressing climate change with climate accounting | Reduce Climate-KIC's operational impact by 'greening' the business | Emissions reduction resulting from Climate-KIC projects and activities

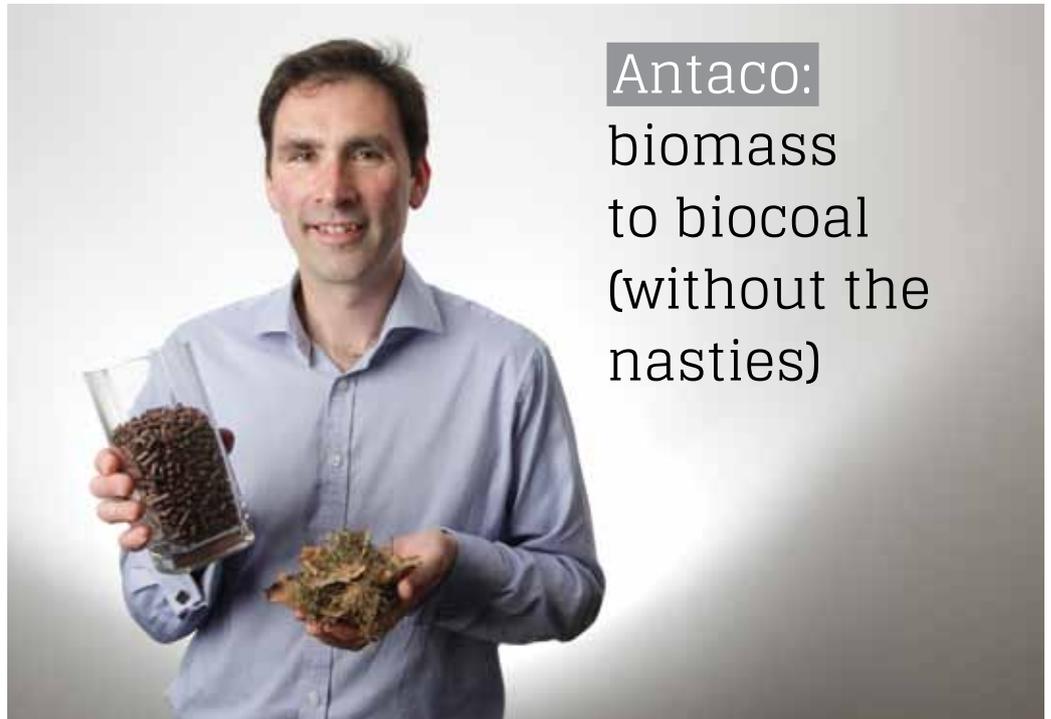
Building our climate change knowledge & innovation community | 50 publications produced | First graduates through the Climate-KIC postgraduate programme | Recruit 65 PhDs and 150 Masters students | Deliver 5 *theJourney* schools and 5 SPARK! lectures across our European centres | 10 student alumni business ideas to stage 1 'Greenhouse' incubation | 120 boundary-crossing Pioneers into Practice



Climate-KIC partner

'This innovation is crucial for keeping Europe competitive'

Climate-KIC gives us the best possible platform for getting our ideas recognised at the European level, says **Martin Bolton** at award-winning UK energy start-up Antaco



Antaco: biomass to biocoal (without the nasties)

'We're only replicating what nature does,' says Martin Bolton, business development director at Antaco, with a nice line in modest irony. 'We take organic matter – including garden and food waste, sewage, sludge, manure and other dry and moist biomass – then squeeze it and heat it up, and out pops a black powder which is easily pelletised and burnt in any pellet stove.'

Antaco's innovative commercial process turns biomass to biocoal with the same heat value as fossil coal, but without the carbon emissions when burnt. A direct replacement for fossil coal, the biofuel's 'coal like' properties give it a big economic advantage over alternatives like wood pellets.

A Climate-KIC Venture Competition winner in 2012, Antaco also received €50,000 funding from Climate-KIC to develop a benchscale model of the process. The Shell Springboard national finalist and winner of the circa €50,000 regional award has also just picked up €1m from the Department for Energy and Climate Change (DECC) to design a prototype plant with a water company, turning sewage from 700 homes into biocoal.

By converting organic matter into solid biofuel, Antaco's technology diverts waste from landfill. Crucially, the product burns in existing plant at little conversion cost. And it's carbon neutral.

Says Martin: 'Our coal will emit the

same amount of carbon per tonne as fossil coal, but because the carbon has been taken up by plants from the atmosphere, no additional carbon is added to the atmosphere. Biocoal only emits what's already in the carbon cycle, so the process is carbon neutral. And where fossil coal emits sulphur and other volatiles, our nasties get washed out into water.'

In terms of lifecycle analysis, Antaco's efficient process uses just 12-15 per cent of energy produced. No wonder commercial ears are pricking up. 'Climate-KIC is opening doors to industry and research partners,' says Martin Bolton. 'It also gives us clout at the European level.'

What matters to us as a backer of ideas is that Climate-KIC teams business with research expertise in a way that also proposes a rollout plan for new, climate-friendly products and services. Within this innovative community you build up productive relationships in a highly networked way. In the case of our Off4Firms project targeting energy use by employees of large corporates, for example, it means we're now

integrating an electric bicycle solution developed by another Climate-KIC partner into our offering for the bigger firms.

Our partner role is to add the business thinking. Alongside the research institutes and the sustainability consultancies we focus on developing business models for products and services that can be scaled up for the global market using climate financing. We provide

worldwide analysis of how to use that finance in order to give good ideas their best chance of success. Besides confronting one of the biggest human challenges we face, Climate-KIC supports the kind of innovation that's crucial for keeping Europe competitive.

Thomas Camerata

*Climate Solutions Director
South Pole Carbon, Switzerland*



Climate-KIC partner

‘Given our proud record, it was natural to be a partner’

BSR is part of Berlin’s ‘Metropolitan Utility Dialogue’ – a fantastic example of how Climate-KIC is bringing waste, transport and other players together to develop innovative infrastructure projects here. We were the first municipal enterprise to commit to ambitious climate protection targets in agreement with Berlin State – targets we met. Our concept for using biogas from organic waste to fuel waste collection trucks was a top three entrant at the German Sustainability Awards. Given our proud record, it was natural we’d become a Climate-KIC affiliate partner.

Climate-KIC links us with key people in the academic community and the real business world, prompting new projects and good ideas. We’re glad Climate-KIC offers start-up funding for innovative projects such as our Waste Management 2.0 project, which is about developing a fill-level forecast tool for waste containers in order to optimise our logistics. It’s another smart climate protection idea.

Vera Gäde-Butzlaff

Chief Executive Officer
BSR, Germany

Eternal Sun: AAA accuracy, whatever the weather

With Climate-KIC’s support and funding, a high-tech Dutch start-up is helping to set the global standard for solar testing technology. Chief executive officer **Chokri Mousaoui** sheds light

With an innovative product portfolio in place and a raft of R&D projects around the world, Delft-based Eternal Sun is looking at a turnover in 2013 of some €1m – not bad for a company in only its second year of trading. The start-up began life as a research spin-off at TU Delft, the Climate-KIC partner.

‘You’ve got to be creative about making the most of what this community has to offer,’ says Eternal Sun CEO Chokri Mousaoui (pictured above, left, with chief technology officer Stefan Roest). ‘Yes, Climate-KIC

gives you the opportunity, but it’s up to you to seize it.’

Eternal Sun specialises in solar simulation technology, delivering AAA-grade testing accuracy with ‘steady state’ illumination on behalf of customers in sectors ranging from bio-energy to aerospace. The firm’s full pipeline of R&D work currently takes in opportunities in Turkey, India, China and Latin America.

‘Our systems,’ Chokri explains, ‘are being used in certification contexts by institutions that want to set the standard for their country. If they adopt

greenTEG: harvesting energy, recovering heat

Giving something back via Climate-KIC’s education programme is part of the deal for **Peter Stein** of greenTEG, winner of the global 2012 Venture Competition for start-ups

‘I like Climate-KIC because it makes a difference,’ says Peter Stein, sales & marketing officer at innovation start-up greenTEG. ‘But the real emotional benefit for me lies in sharing or passing on knowledge through the organisation’s education activities.’

Peter first met Climate-KIC on a green venture and business ideas



programme hosted by Climate-KIC in Switzerland, later signing up for the summer school, *theJourney*, to which he now contributes as teacher. In 2009 he launched greenTEG with colleagues to design, manufacture and market solutions for increased energy efficiency.

Based on a novel manufacturing



our testing technologies as part of their national or international ambitions it means we too become part of the global standards framework.'

Placed third in Climate-KIC's 2012 European Venture Competition, Eternal Sun received funds through the acceleration programme to develop its business model. An introduction trip to Silicon Valley gave the team access

to venture capitalists and potential US customers. 'These were people,' says Chokri, 'you wouldn't get to meet any other way.'

What would he say to others thinking of embarking on the same journey? 'Start. Join. Entrepreneurs need guts, it's true – but Climate-KIC gives you a platform for putting your passion into action.'

'We want to take a lead in making Europe more sustainable'

In 2012 our partnership with Climate-KIC strengthened considerably. Co-operation with and through the network led to new projects and PhD positions, which in turn activated the TU Delft community to take part in Climate-KIC activities.

Projects we participate in span a wide range of topics, from biojet fuel and urban water management to zero emission transport and computer systems for resilient cities. We've also seen a big increase in Delft start-ups benefiting from Climate-KIC's acceleration programme. We're extremely proud that 21 of our Masters courses were accredited with the EIT Climate-KIC label – it means our best students can get more from Climate-KIC's education programme.

In the years ahead we envisage even closer ties with Climate-KIC. TU Delft wants to play a leading role in making European society more sustainable. To do this we plan to develop our campus in collaboration with Climate-KIC, creating more room for sustainable innovations and for inspiring others.



'You can stick one on a window and see how much is lost per window per day. The next step is to generate energy from wasted heat.'

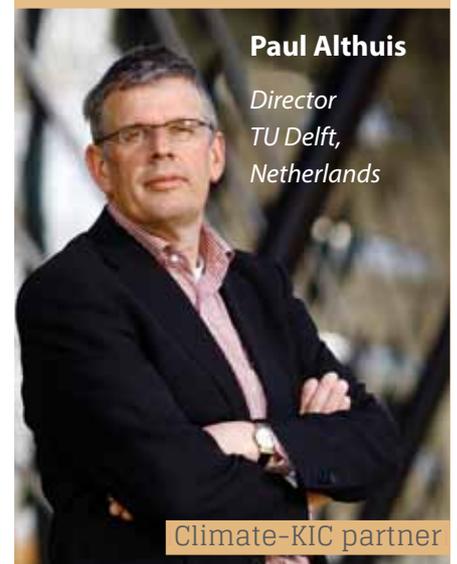
GreenTEG was winner of Climate-KIC's 2012 Venture Competition, celebrated at the Innovation Festival in Bologna. How did the start-up beat off the competition? 'It's about the potential of our technology,' says Peter. 'It can be deployed in lots of situations that have a climate impact.'

Next year the company brings its groundbreaking energy harvester to market. The device turns heat or temperature into electricity in a smart, remote, autonomous way.

'Wireless controllers exist,' says Peter, 'but they use batteries that need to be replaced. Our technology introduces a harvester into the product, generating the electricity to meet its needs by itself.'

process developed at Climate-KIC partner ETH Zurich, the current product portfolio includes customisable heat flux sensors, with thermoelectric generators for energy harvesting and waste heat recovery due to come on stream in 2014.

'Our sensors optimise buildings so they lose less energy,' explains Peter.



Paul Althuis

Director
TU Delft,
Netherlands

Climate-KIC partner

‘It helps us build the holistic business models we need’

I see INRA’s partnership with Climate-KIC as vital. We all recognise the significance of agriculture’s impact on climate change and vice versa. Right across our mission, from social innovation to food security, INRA acts on fronts where climate change is the principal driver. So it was obvious to us we needed to become a Climate-KIC partner.

As project manager for our relationship with Climate-KIC I’m looking to help INRA researchers and their industrial and academic partners deliver innovative projects in innovative ways. One of our Climate-KIC projects, for example, focuses on city growth. Because urban sprawl hampers agriculture, it has a big impact on land and water resources. Although we’d studied this, we didn’t know how to ‘sell’ our findings to stakeholders with widely differing interests. That’s what the partnership does. Climate-KIC connects us to people across Europe who can help us build the holistic business models we need.

Suzanne Reynders

National Institute for Agricultural Research, France



Climate-KIC partner



Ventive: a brighter future for ventilation

The key thing about the partnership is the sense we have of driving it, says Ventive’s technical director **Tom Lipinski** of the start-up’s ongoing relationship with Climate-KIC

A Shell Springboard finalist in 2013, Ventive has won £950,000 in investment since joining Climate-KIC’s incubator programme in 2012. The good news continues with a move into Birmingham offices this year.

Ventive’s passive ventilation with heat recovery technology retains up to 97 per cent of a building’s heat, introducing a temperate airflow via a patented heat exchanger and roof cowl. Benefits include lower fuel bills, less damp, and better air quality.

For Tom Lipinski (pictured above, immediate left of Ventive product, with Climate-KIC’s West Midlands team), an important driver of the company’s early success has been the proactive support of Henriette Lyttle-Breukelaar (above, front left), Climate-KIC’s innovation lead in Birmingham. Besides exposure to potential clients, this support has given Ventive access to major shows.

Climate-KIC’s commitment also boosts the confidence of would-be investors, as Tom explains. ‘One of our business angels has invested in the network before, and I’m sure that helped when it came to our turn.’

With an eye on making even more

of Climate-KIC, Ventive is a host for next year’s industrial placement programme, Pioneers into Practice. ‘We’re big fans,’ says Tom. ‘It brings in new blood and helps us demonstrate a commitment to employing locally.’

Ventive’s focus today is on the value optimisation of two existing products and the launch of a third. For Tom Lipinski, Climate-KIC’s support is key to the company’s ambitions for rapid expansion in the Birmingham area.

‘What I like most about this partnership is the idea that we’re driving it. Climate-KIC can only help you as much as you want to be helped.’

‘For me, it’s about the interdisciplinary connections’

Our NPL open day was a great way to meet other Climate-KIC partners. We showed groups around our lab works, from testing energy efficient lights to monitoring emissions and

tado°:
intelligent
heating for a
cosier world

Climate-KIC's support is helping German high-tech start-up tado° fast-forward heating into the 21st century, says managing director **Leopold von Bismarck**



How can we lower heating costs and still keep our homes snug? Tado°, runner-up in Climate-KIC's 2012 Venture Competition, offers a cloud-based mobile app solution that runs your heating 24/7.

By conflating real-time data like user behaviour, weather conditions and home characteristics, the system customises an ideal pattern of personal consumption, potentially saving 27 per cent in heating costs on average.

Tado° consists of a white box that attaches to your boiler or replaces the thermostat, creating links that enable the system to go online. When you leave home, tado° lowers the temperature to save energy. When you're coming back, the system warms up the house, taking account of



factors such as the weather and your distance from home. No intervention is necessary, unless you choose to override.

At the heart of the brand is the idea of living comfortably while acting responsibly. Says tado° MD

Leo von Bismarck (pictured above, left, with team): 'Reducing energy consumption easily is what we're all about.'

Launched in Germany and Austria in 2012, the Munich-based start-up – already 26 strong – is getting lots of traction across Europe, and plans to enter the receptive UK market during 2013. 'What we offer is compatibility across most systems,' says Leo, 'with low barriers to entry.'

Having made good use of Climate-KIC's incubator programme support, tado° has sights set on a further Climate-KIC innovation project. 'It's great to have Climate-KIC on our side,' says Leo. 'That support is crucial for reaching the next level even after the important seed phase.'



Climate-KIC partner

supporting biofuels production. As the UK's national measurement lab we bring the integrity of our

independent verification techniques to bear on technologies developed by SMEs within Climate-KIC. That independence has real weight in the eyes of would-be customers. And beyond that, the measurements we deliver feed into policy change.

Climate-KIC is impact-driven, and we're the same. We don't limit ourselves to theoretical research. We exist to improve quality of life and industrial competitiveness, and

the solutions we work on must be scalable. For me, Climate-KIC's value is in the interdisciplinary connections it makes possible. It reaches beyond the usual suspects we'd expect to partner. The added benefit is the pan-European dimension.

Jane Burston

Head, Centre for Carbon Management National Physical Laboratory, UK

CARBOCOUNT-CITY: putting the city centre stage

A Climate-KIC co-funded programme is set to reduce the uncertainty of greenhouse gas registrations in our big cities, says project deputy co-ordinator

Irène Xueref-Remy



Lunched in 2012 and scheduled to run for three years, CARBOCOUNT-CITY brings Climate-KIC and six other players together to deliver a commercially available, cost effective and easy-to-deploy greenhouse gas (GHG) monitoring service for large cities. It's a great example of a multi-partner collaboration.

Established first in Paris, where three monitoring stations have already been installed by forerunner project CO₂-Megaparis, CARBOCOUNT-CITY will later extend its atmospheric transfer model to Rotterdam. The service, which will provide online daily maps of carbon dioxide (CO₂) and methane

(CH₄) emissions, uses 'top down' modelling to reduce the uncertainty of GHG registrations.

'Today's inventories use bottom-up methodologies,' says Irène Xueref-Remy of France's Laboratoire des Sciences du Climat et de l'Environnement, co-ordinator lab for the project. 'You start off with ground level numbers and end up with what's in the atmosphere, but the variables are significant. Top down means we measure real concentrations and use these to optimise existing inventories.'

With an eye on the business potential of CARBOCOUNT-CITY, project partner Astrium is targeting



'Estimates suggest that 75 per cent of global GHG emissions stem from 100 urban or industrial hotspots'



Pioneers for a low carbon economy in Europe

A new type of mobility programme designed by Climate-KIC is nurturing the multi-skilled practitioners needed to meet the EU's ambitious climate targets, says PIP programme architect **Jon Bloomfield**



urban and regional markets with a likely interest in the project's outcomes. Ile-de-France, where a climate plan exists for cutting GHG emissions by 25 per cent by 2020 compared to 2004 levels, is an obvious candidate.

Creating synergies

The project also sets out to create synergies with Los Angeles and Sao Paulo under the global Megacities programme umbrella while talking to other cities looking to reduce their GHG emissions.

'This city focus really matters,' says Irène Xueref-Remy, 'because best estimates suggest that 75 per cent of global GHG emissions stem from 100 urban or industrial hotspots. So there's a great deal of excitement about what we can do in our cities.'

Irène sees a 'disconnect' in the industrialised world between the volume of emissions generated and a collective sense of responsibility for them. 'Lots of us don't feel as concerned as we might because the consequences happen elsewhere,' she says.

'We're seeing more and more extreme weather events causing heartache in the world, but we can all do our bit to help. This is a contribution we can all make. It's about one plus one plus one.' ●

Two years after its launch, Climate-KIC's Pioneers into Practice (PIP) programme is getting great feedback, with 61 per cent of participants saying it had furthered their overall understanding of the low carbon agenda, and 63 per cent reporting they'd gained specific insights from their PIP placements.

Operating in six EU regions – Central Hungary, Emilia-Romagna, Hessen, Lower Silesia, Valencia and West Midlands – Pioneers into Practice starts from the position that making the transition to a low carbon society

and meeting the EU's 20-20-20 climate targets are tough calls.

'There's no magic bullet,' says programme co-designer Jon Bloomfield (above). 'It demands engagement from all sorts of people at all levels of society. It calls for a new breed of multi-skilled pioneer equipped in the thinking and practice of low carbon transition.'

Cross-disciplinary reach

PIP nurtures multi-skilled practitioners using new types of training programme that recognise the ▷



◁ breadth of the climate change agenda and the cross-disciplinary capacities needed to confront it. Significantly, it reaches out beyond the student community to attract participants of all ages and work backgrounds.

Says Jon: 'PIP offers them two placements, at home and abroad, that take them out of their comfort zone. They get experience of another European region, plus a workshop and mentoring element that has real gravitas. It adds up to a systematic innovation programme that's highly manageable in terms of the time commitment.'

Having got PIP off to a great start, all the regions are looking to 'up' the quality of what's on offer by, for example, fine-tuning the international placements planning and enhancing the mentoring support.

They're also looking to extend the programme to 200 participants in 2013, rising thereafter, in response to a clear demand for this new type of mobility programme geared to professional development.

Already there are signs that pioneers are scaling up their activities from, say, micro-business to SME. And the potential is there to improve the outlook of employees of larger organisations too.

'Because we've had such good feedback from participants,' says Jon, 'there's a strong case for replicating this model in other regions, or within other regional groupings, to help meet the EU's climate targets. It's not just our six regions, after all, that need multi-skilled practitioners steeped in the low carbon agenda.' ●



AirportNEXT: the airport as a sustainable city

‘We want
Climate-KIC
to tell people
all about the
challenges
we face and
the progress
we’re making’

What we really value is academia reaching out to help us pursue our sustainability agenda, says **Jonas van Stekelenburg**, innovation director at Climate-KIC partner Schiphol airport

‘**W**e’ve been using the term airport city to describe Schiphol for 15 years,’ says Jonas van Stekelenburg, leader of the innovation unit at Amsterdam’s busy hub airport. ‘What we have is a city without citizens, but with everything else in place, from shops to a hospital. You can even get married here.’

Jonas’s vision of the airport of the future has helped turn Schiphol into one of the top sites for business in the Netherlands. ‘This is where companies want to be,’ he says. It’s a vision that fed directly into 2012’s AirportNEXT conference, co-hosted with Climate-KIC, exploring new ideas for more sustainable airports.

With contributions from some 250 people representing business and civic interests, AirportNEXT looked at ways of helping the aviation industry lower its emissions profile by innovating in a wide range of areas, from biofuel technology to greener terminals. For Schiphol, climate optimisation means creating synergies between the vast array of on-site activities at Europe’s fourth busiest airport.

‘Schiphol,’ says Jonas, ‘is pursuing its sustainability agenda full force. In terms of innovation we’ve always been a world-beater. Look at our plans for a fleet of 30 electric buses, for example – unheard of anywhere else.’

With industry partners like KLM and Air France and university partners from within Climate-KIC, Schiphol holds regular innovation workshops exploring low carbon options and imperatives.

Open mindset

For Jonas, there’s real value in academia’s support for aviation’s sustainability ideals. ‘Because there’s a perception, wholly false, that we’re far more polluting than, say, shipping, it can be tough for academics to reach out to us. We applaud the open mindset that Climate-KIC brings to the search for solutions.’

Central to that mindset is transparency. Says Jonas: ‘We want Climate-KIC to tell people all about the challenges we face and the progress we’re making. It should be about the real story, the whole story.’

As a Climate-KIC partner, Schiphol benefits from an inspirational community that teams people of all ages and backgrounds. ‘What we’re doing is pretty new,’ says Jonas. ‘Yes, it’s about technical excellence. But at a more human level it’s also about doing your best to create good things.’ ●

Cooler, healthier cities: blueprint for a Dream

An ambitious
Climate-KIC programme
that transforms the
quality of urban life is
gathering momentum
rapidly. Project leader
Čedo Maksimović
isn't so much surprised
as delighted

Climate-KIC's €3m Blue Green Dream initiative has generated widespread interest so emphatically that its legacy looks increasingly enduring.

'For years you push for progress,' says Čedo Maksimović, Professor of Civil and Environmental Engineering at Climate-KIC partner Imperial College London, 'but the breakthroughs can happen in just a few decisive meetings or moments.'

Blue Green Dream helps urban planners, landscape architects, water managers and others work together towards more sustainable cities in a way that improves urban liveability, lowers the impact of heatwaves, fights drought, protects against flooding and increases biodiversity while also saving money.

At established test sites across Europe – the Tempelhof redevelopment site in Berlin, Germany (below), the new Blue Green Wave building at the École Nationale des Ponts et Chaussées in Paris, France (right), and sites being developed in the UK and the Netherlands – the

programme demonstrates the benefits of improving urban ecosystem services in areas like air quality, noise pollution, aesthetics and human health when integrating the functions of water (blue) and vegetation (green) infrastructures.

Massive opportunity

With strong interest from Scandinavia and a new regional focus on southern Europe, the project is already pushing its own boundaries. 'The plan,' says Čedo, 'was to concentrate on Europe until 2014, going global after that. But things are happening much sooner than in our most optimistic forecasts.'

In Singapore, a key regional hub, Blue Green Dream has three projects in hand with government, civic and academic partners, including use of the Garden by the Bay resource as an open space lab. With partner Bonn University, the programme is in talks about sustainable water management in sub-Saharan Africa.

In London, Blue Green Dream has had positive contact with major





‘What we’re doing is bringing together things that used to be done piecemeal and demonstrating the benefits of integration’

developers about various London sites. Says Čedo: ‘When our philosophy is embedded in their corporate strategy we can save developers money on construction while residents save on energy bills.’

Blue Green Dream isn’t about the complex or new. ‘This isn’t rocket science,’ says Čedo. ‘All we’re doing is bringing together things that used to be done piecemeal and demonstrating the benefits of integration.’

As the EU announces a major initiative on green infrastructure that will attract significant new funding in the period to 2020, Čedo sees a massive opportunity to shape the agenda using blue-green solutions. ‘We have the knowledge, conviction and courage,’ he says, ‘to take our pitch to the highest level!’ ●



Driving industrial symbiosis in Europe's regions

EUR-IS is accelerating the take-up of industrial symbiosis methodologies in the UK's West Midlands, Central Hungary, and Poland's Lower Silesia, as project leaders

Adrian Murphy and **Peter Levett** explain

A Climate-KIC innovation project teaming International Synergies (UK) with Wroclaw Research Centre EIT (Poland) and IKFA (Hungary) is creating regional innovation platforms that apply new research, processes and technologies to practical problems in order to cut carbon dioxide (CO₂) emissions.

Launched in July 2012, EUR-IS nurtures industrial symbiosis initiatives in diverse European economies and connects them to research expertise from Climate-KIC's Dutch co-location centre, TU Delft.

Industrial symbiosis brings sectors

together via an innovation network to achieve the best use of resources. It creates new business opportunities, reduces emissions, and applies low carbon innovation directly.

Demand-led innovation

'The key to EUR-IS,' says project lead Adrian Murphy (below, second left, with team) of International Synergies, 'is in engaging closely with industry. It's about listening, then asking: how can we fast-track innovation to make a difference?'

In all three participating regions, EUR-IS revealed a strong appetite for



involvement. Says project manager Peter Levett (below, first right): 'We found a lot of enthusiasm out there, and the project is already delivering significant metrics.'

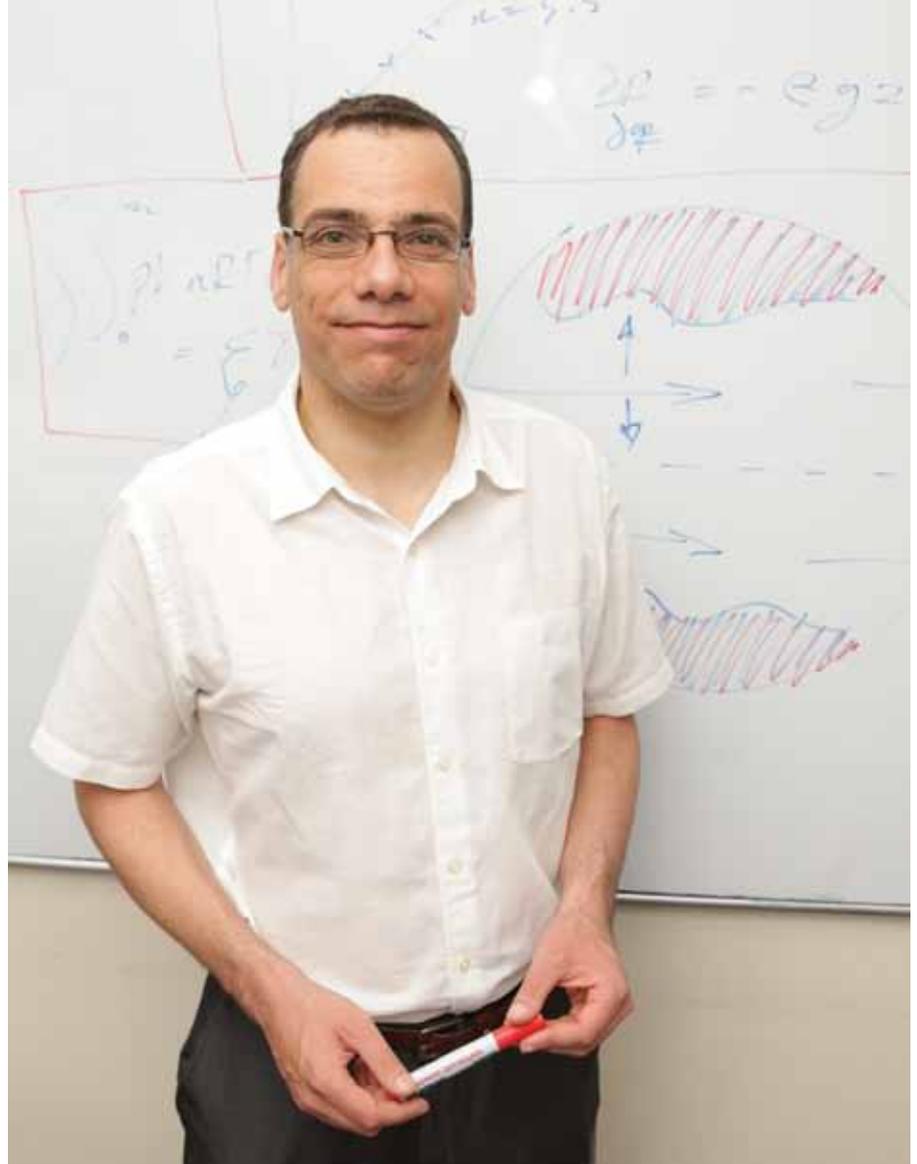
In Lower Silesia, EUR-IS established a completely new industrial symbiosis network. In Hungary, it enabled an existing network to ramp up its innovation agenda. In the Midlands, UK, a new delivery approach targeting large companies and their supply chains has been very successful.

TU Delft's role is to support the project through academic knowledge and focused research. EUR-IS helps scholars develop ideas that confront barriers to business take-up of low carbon opportunities.

Having tapped into a big demand in Europe's regions, EUR-IS has its sights set on Emilia-Romagna in Italy. 'We're going back to Climate-KIC with an extended programme of proactive industrial symbiosis,' says Adrian Murphy. 'And that includes a growing education element based on *theJourney*, SPARKI, and Pioneers into Practice.'

The team is also talking to China, which is looking to adopt industrial symbiosis in 100 cities. 'It shows the level of demand globally,' says Adrian, 'as countries and regions begin to adopt industrial symbiosis within their policy frameworks.'

Wherever the call to action, EUR-IS engages with business by confronting practical problems. 'This goes beyond theories to embrace real-life issues,' says Peter Levett. 'We call it demand-led innovation.' ●



Oasis: making climate risk more transparent

A Climate-KIC innovation project is helping the global insurance sector calculate the risk of extreme weather events more effectively, as UK partner Imperial College London's **Ralph Toumi** explains

As extreme weather impacts more and more profoundly, a new open source catastrophe model is giving insurers better access to risk data. Climate-KIC's Oasis, which allows transparent risk calculation of major hazards like floods, provides an open architecture loss modelling framework

for the global community.

A non-profit grouping of 20 insurance companies plus Climate-KIC, Oasis develops catastrophe modelling software and the standards for it, with Climate-KIC as both core developer and principal supplier of data.

In a sector where corporate ▷

◁ interest has tended to restrict access to available data, Oasis creates an open market in comprehensible tools for risk calculation that benefit businesses, governments and citizens.

'It's not that the modelling didn't exist,' says Ralph Toumi at Imperial's Department of Physics. 'It did – but because it was proprietary it wasn't transparent. And because the supply of models was limited, the appreciation of risk was incomplete. Oasis gives us a much better grasp of uncertainty – transparently.'

New territory, new risk

Oasis opens the market to new entrants and so extends our understanding of risk. Suppliers can plug into the software, whether or not they're Climate-KIC partners, to develop a flood model for, say, Thailand.

'It matters right now to the insurance industry,' says Ralph Toumi. 'Climate change means there are new risks emerging all the time, so insurers moving into new territories face new risk in a new locale.'

For Oasis partner Lloyds of London and others, the project means the industry can exploit better quality data to inform pricing, capital and reserve levels against a backdrop of mutating risk. For nations and peoples, it's about mitigating vulnerability in the face of extreme weather events.

With 20 members and counting, Oasis is set to gather momentum in 2013 and beyond. This year sees the release of a new UK flood prototype that uses a real portfolio of millions of households to make profit and loss calculations unprecedentedly robust.

'Our strategic priority is to build credibility in the insurance sector,' says Ralph Toumi. 'But because our software is transparent and open, there's no reason why governments and individuals can't use it too.' ●



Winning ways with water

A voucher competition run by Climate-KIC in the Netherlands and partner Deltares is directing much-needed funds to bright ideas for water. **Lucas Janssen**, Climate-KIC programme manager at Deltares, takes up the story

Four SMEs have won vouchers worth €20,000-50,000 to spend within Climate-KIC in a 2012 competition sponsored by partner Deltares, the Dutch independent institute for applied research in the fields of water, subsurface and infrastructure.

Inviting innovative proposals on the theme of 'water in the context of climate mitigation and adaptation', the jury looked for market potential, customer focus, climatic impact and entrepreneurial flair.

Winners were Bluerise (ocean thermal energy), GeoCycli (satellite-based flood messaging), HKV (historical flood database), and MCC (cell phone water management), with the awards being made on the basis of corporate ambition and the related offer from the Climate-KIC partner.

Says Dr Ir Lucas Janssen, head of economics, scenarios and innovation at Deltares: 'These start-ups might have



little or no money to spend on vital work by research institutes, for example, so the vouchers make a real difference. The competition helped shift their thinking away from technology towards the market.'

Knowledge transfer

Voucher winners now have a knowledge transfer contract to develop their proposal with Deltares or with other Climate-KIC partners. The successful format lends itself to multiple themes, with Climate-KIC in the Netherlands already preparing business challenges for SMEs in the bio-economy and other fields.

For Lucas Janssen, the competition delivers on a key corporate objective. Like Climate-KIC, Deltares exists to make knowledge available in support of business competitiveness. 'We're very enthusiastic about our partnerships with these SMEs,' Lucas says. 'They have

a different way of working, which can be inspiring.'

While Deltares offers Climate-KIC significant support in several of its defining challenge areas, Climate-KIC enables Deltares to extend its activities across Europe, principally in the shape of innovation projects, and often with interesting start-ups or spin-offs.

'What we really like about Climate-KIC is the fact that its private sector links are so much stronger than we find in comparable programmes or communities,' says Lucas Janssen. 'In many ways it opens up a new set of challenges for us in terms of how we think. Our Climate-KIC connections remind us that the knowledge we develop, or the findings we reach, can help shape commercial products and services.' ●

'These start-ups might have little or no money to spend on vital work by research institutes, so the vouchers make a real difference'

Switching students on to entrepreneurship

Winter or summer, Climate-KIC's *theJourney* programme has the same rationale. It's about nurturing the commercial mindset, says deputy director of education **Eleanor Saunders**



Take a cohort of motivated participants. Immerse them in an intensive programme of climate innovation spanning five weeks at three European locations. Watch as they learn the language of business.

That was the route map for Climate-KIC's November 2012 *theJourney*, staged in winter for the first time and taking in Delft in the Netherlands, Budapest in Hungary, and Wroclaw, Poland. Snowball throwing was on the agenda. But otherwise the event had all the hallmarks of the established summer school.

In Delft, where its focus was on the scientific context for climate change, the programme included visits to the Sand Engine and inputs from Deltares and TU Delft. In Hungary, where science gave way to business, delegates met inspirational young entrepreneurs and visited organisations facing climate challenges, including Organica and Budapest Zoo. In

Wroclaw they worked up their business plans before presenting to a jury that included a Polish venture capitalist and experts from within the Climate-KIC community.

In developing their business ideas, *theJourney* students are looking for constructive feedback. 'They're not pitching for funds,' explains Eleanor Saunders, Climate-KIC's deputy director of education. 'It's about the learning experience, the contact with experts, the peer-to-peer interaction, and the exposure to cultures.'

Increased outreach

In shifting its focus to people and places beyond Climate-KIC's core centres, this latest *theJourney* reflects a new commitment to increased outreach activity across all three of Europe's KICs.

'Because Climate-KIC already has regional communities or networks in countries like Poland and Hungary,'

says Eleanor Saunders, 'it makes sense to build these up first. And we know they're very keen to engage with us. In Hungary, for example, our recruitment has been particularly strong.'

By reaching out to new cultures, *theJourney* offers participants a more rewarding experience. 'This time we had a lot more professionals from eastern Europe,' says Eleanor. 'It made for a different kind of group. We want to build on that, broadening our recruitment and enriching our talent pool.'

Although not everyone who signs up for the school also commits to a Climate-KIC Masters, Eleanor is in no doubt about the value of *theJourney* to all. 'It's a unique learning experience. It switches our science students on to entrepreneurship and vice versa, so they can go out into the world and make a difference.' ●



Helping start-ups rise to the innovation challenge

Climate-KIC's innovation slams are helping Europe's start-ups access valuable insights and resources. They also bring co-host partners closer to their markets, says entrepreneurship lead in Germany **Franka Birke**

Grants to the tune of €95,000, office space, and a coveted place on Climate-KIC's acceleration programme – that was the first prize tally carried off by Cypriot start-up ENERMAP at Climate-KIC's first Open Innovation Slam held in Berlin last year.

Co-hosted with innovation team partner Sense4En, the 2012 slam focused on tackling heat and energy loss in domestic households. Using a crowd sourced online take-up format, the event challenged start-ups across Europe to develop dynamic tools that give consumers the energy use feedback they need to cut consumption, reduce emissions, and save money.

'Our 2013 and 2014 innovation slams will have a comparable structure and format,' says Franka Birke, Climate-KIC entrepreneurship lead in Germany (pictured below, right, with Visions in

Focus coach Beth Susanne). 'We look for a co-host or partner who helps develop the challenge theme or the problem statement for each event.'

Opening doors

In 2012, the call for entries sparked 800 registrations. Of the 50 teams that submitted ideas, ten were invited to Berlin for a weekend of coaching and workshops that took their proposal forward.

ENERMAP's winning idea in 2012 was a free-to-access software application that maps and colour-codes buildings according to their energy use rating. The aim is to shift patterns of consumption.

The Cypriot company is currently developing its business model with Climate-KIC's entrepreneurship team in the UK as part of its innovation slam prize package.

For all the teams taking part the events are a great opportunity to refine their ideas across a weekend devoted to building a scalable model. Says Franka Birke: 'Participants expand their networks and gain access to potential investors. They also get the kind of media exposure that opens doors.'

For partners co-hosting a slam with Climate-KIC it's about getting closer to the market by tapping into what customers and potential customers are thinking within a particular area of interest or operations.

'Together with our slam partners,' says Franka, 'we're looking for early stage proposals for climate change mitigation and adaptation. The prize for the winner is considerable in terms of resources and insights. And society wins, too. We want to inspire Europe's start-ups to bring us their best climate innovation ideas.' ●

'We want to inspire Europe's start-ups to bring us their best climate innovation ideas'



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