INNOVEIT 2015

EIT INNOVATIONS IN PRACTICE

Virtual City Tour

Contents

Virtual City Tour: Innovations in the spotlight

The EIT Innovation Forum - INNOVEIT 2015 took place in the city of Budapest during 5-7 of May 2015, bringing together more than 600 stakeholders from the European Innovation Community.

INNOVEIT 2015 promoted innovation and encouraged entrepreneurship, providing a platform for dialogue between the EIT Community and external stakeholders. The event celebrated also the best EIT community ventures, graduates and innovation teams, enhancing networking and co-operation with the European Innovation Community.
The objective of the Virtual City Tour was to showcase concrete innovations or innovative activities related to cities, selected from the Knowledge Innovation Centres (KICs) in an exemplary and entertaining way.

What is the Virtual City Tour?

During the Virtual City Tour participants had the opportunity to discover concrete EIT-KIC innovations and results in a guided tour. Each innovation was presented by a specialist from one of the KICs and participants had the chance to ask questions, before moving on to the next innovation.

The Virtual City Tour was composed of 29 innovations: 24 innovations/ innovative activities showcased from Climate-KIC, EIT Digital* and KIC InnoEnergy and five innovation plans from EIT Health and EIT Raw Materials.

What follows in this booklet are the factsheets summarising the main features of the innovations showcased, their partners and how the KICs and the EIT supported their development.

We wish you an entertaining tour through all the innovations!

* Note that by June 2015, EIT ICT Labs changed its name to EIT Digital, whilst the following factsheet were produced before May 2015. More information at http://eit.europa.eu/newsroom/eit-ict-labs-becomes-eit-digital

3cixty

Beyond Maps

3cixty apps help people explore many different aspects of a city at once.

an EIT ICT Labs initiative

Co-operation with EIT ICT Labs

The 3cixty apps have been developed within an innovation activity in the EIT ICT Labs Urban Life & Mobility Action Line since 2014. The consortium comprises large and small companies, research institutes, and universities.

Challenge

With current apps, when you want to know about what to do and where to go in a city, you can find many individual pieces of information, but it's hard to put them together. So you miss opportunities, lose time, and waste energy.

Solution

3cixty apps help you to compare and combine information about events and places in a city like never before. You can look for a variety of interesting events and places that you can travel between conveniently and seamlessly.

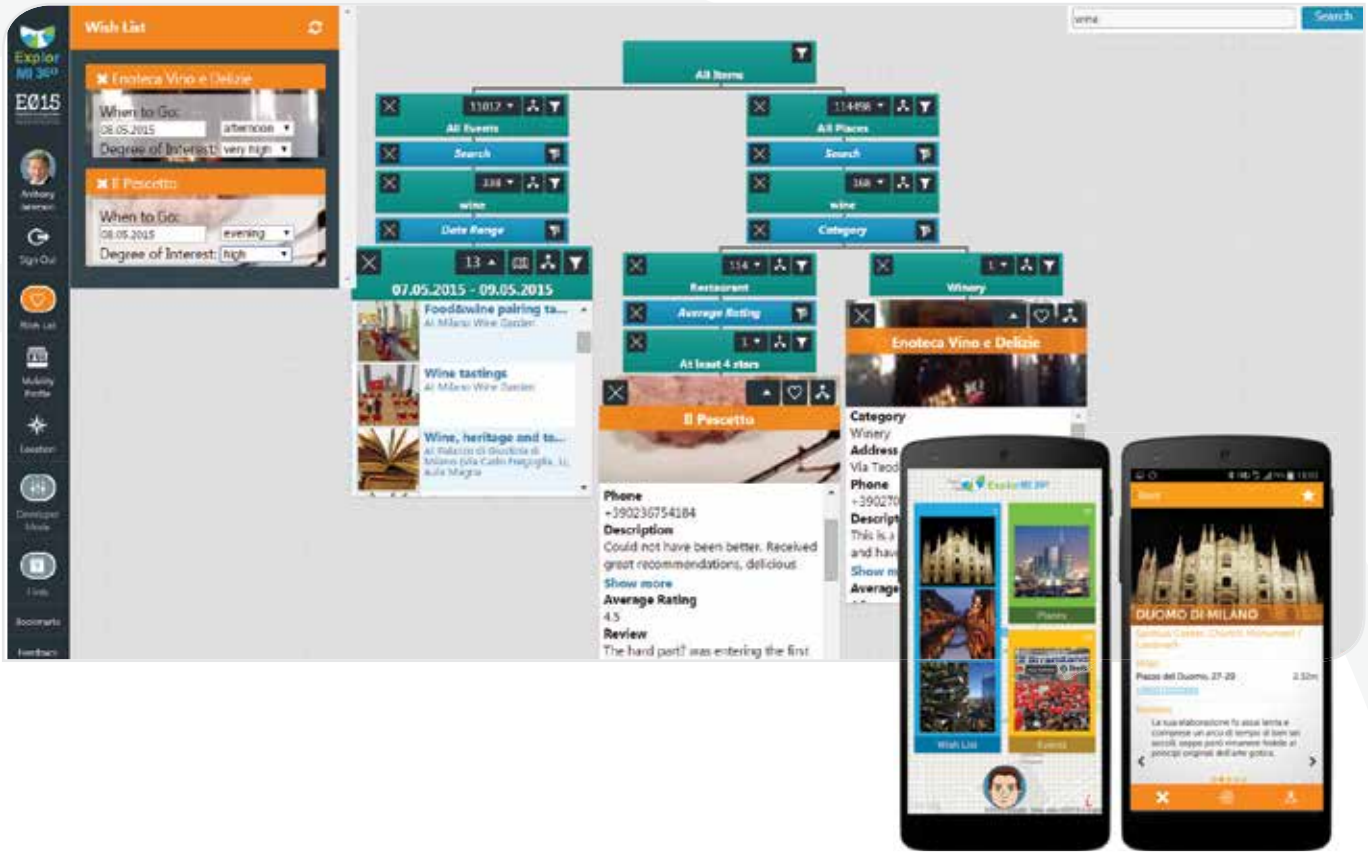
Societal Impact

3cixty apps enable people to find out about more of the events and places in a city and to get to them more effectively.

The result will be improved quality of life: more content to discover and enjoy, less time and energy moving around a city. It also means more business for the places that people go to.

Key Facts

ExplorMI 360, the first major 3cixty app, is being made available to visitors to Expo Milano 2015 to help them get the most out of Expo and the city.



The results-oriented, entrepreneurial approach supported by EIT ICT Labs inspired the 3cixty partners and SMEs to collaborate with exceptional intensity toward the achievement of an ambitious shared goal. – Anthony Jameson, Principal Researcher, DFKI, and 3cixty innovation activity leader

EIT ICT Labs helped conceptualize and execute the activity, in particular for its first application setting at Expo Milano 2015. EIT ICT Labs enabled partners to combine separately developed technologies into a tightly integrated system. Business Developers helped establish contacts with local stakeholders.

Perspectives

Commercialization and extension to other cities are planned for 2016.

In collaboration with

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5GrEEn

Green Mobile Networks

Reducing energy consumption for mobile access networks such as base stations and mobile user terminals for sustainable and affordable mobile internet growth.

Co-operation with EIT ICT Labs

Towards Green 5G Mobile Networks activity in Future Networking Solutions. Thanks to the complementing partner roles, Telecom Italia, Ericsson, KTH and AALTO Universities, EIT ICT Labs activity allowed to develop green mobile network solutions by applying technology transfer from academia to established companies such as a telco vendor. Involvement of the mobile operator in the experimentation process allowed testing some of the green network solutions using real network traffic data from the base stations. This collaboration would not be possible without this EIT ICT Labs activity.

Network power consumption critical in cities

Power consumption is a crucial issue that is going to become even more important as the number of cells increases through densification. Although the smaller cells involved in 5G will result in lower power requirement, there will be both small and larger cells, leading to increasing interference. Additionally, the larger number of cells will make the real time tuning of power distribution even harder. The core innovation is to adapt the bandwidth required for the traffic and in this way reducing power consumption. The innovation is based on studies of power consumptions and on a simulation tool that can compute potential savings in power consumptions. The simulation package is used in education and is under consideration for extension and potential product as a simulation tool.

90% energy savings with 5GrEEn compared to today

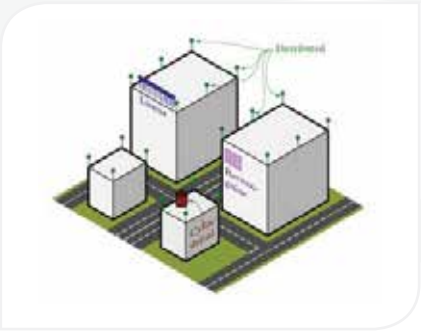
It has been shown that it is possible to reduce the energy consumption up to 90% compared to 2010 reference. Up to now, the existing mobile networks cannot adapt to the user needs and traffic fluctuations during the day resulting in waste of energy especially during low traffic hours.

Societal Impact

Mobile internet has become a part of everyday life connecting everything and everyone that can be connected asking for more capacity in mobile infrastructures deployed in the cities. Green Mobile Networks will allow network operators to boost their capacity without any increase in the cost to provide sustainable and affordable mobile connectivity for all. Decreasing energy consumption and hence the CO_2 emissions result in cost reduction since energy is an essential part of the overall cost.

Key Facts

Some of the green mobile network solutions such as infrastructure deployment and traffic adaptive dynamic network operation can be already used in near future thanks to the standardization contributions during past years in 5GrEEn activity. We have studied green mobile infrastructure design and its economic feasibility using cell micro sleep feature in our activity during 2013 and 2014 which then became a product in September 2014 as a part of a large software release in Ericsson called 15A. Please see the news release www.ericsson.com/news/1857801.



Green Mobile Networks will allow network operators to boost their capacity without any increase in the cost to provide sustainable and affordable mobile connectivity for all.

There are a lot of papers and also even an educational tool in Royal Institute of Technology (KTH) showing how energy can be saved. Various WSs have been organized in different Co-location Centres. For 5G Systems we are in a very early stage for commercialisation such as 5G radio interfaces. However some of the energy optimized network deployment and operations solutions we have developed during 5GrEEn can be already used in near future thanks to the standardisation contributions in 5GrEEn. Several achievements of 5GrEEn Innovation can be divided into three:

1. We have studied deployment optimization and economic feasibility of base station sleep feature in 5GrEEn during 2013 and 2014 which allows cells to switch to a low energy mode when there is no transmission even in a millisecond time frame. This study catalyzed the release of its cell micro sleep feature by Ericsson as a part of a product in September 2014 as a software release. Similar to this, the 5GrEEn solutions will be potentially commercialized through large telco vendors since they should be integrated to existing network equipment and infrastructures.

2. "Green mobile terminal" innovation in 5GrEEn, the "energy-efficient proxy" allows mobile user terminals save energy. This has various commercialization options. The benefits are either decreased energy consumption (up to 80%) and lower content delivery time (up to 50% lower) for web content. The technology can be deployed by an operator, a third-party solution provider or content owner. The commercialization could be performed by a larger company, like a network vendor or software company, as a new product. Aalto Center for Entrepreneurship (ACE) is currently helping the researcher on commercialization work.

3. "Green Mobile Cloud" innovation showcased via the "Cloud RAN demonstrator" that it is possible to drive the cost of operating the cellular infrastructure down and allow the system to adapt to the variable mobile service requirements. The cost reduction will come from two factors: 1) Simplified software development compared to embedded system design. 2) Economy of scale as standard Cloud technologies can be utilized. Combined with other advancements, C-RAN can potentially open up new market for cellular infrastructure as a service for small local operators (rural broadband), building and facility owners, factories and utility companies and help improving the sector productivity and quality of life.

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Carbocount City

The CarboCount project represents a considerable investment in terms of research and development. Climate-KIC has been critical in supporting the long term vision which CarboCount has, providing both the potential contacts and financial assistance necessary to develop this into highly innovative and marketable product.

Carbocount City developed an emissions measurement system with the potential to be replicated in all megacities across Europe.

The system is being trialled in two European cities, using sensors and processes to take, model and report accurate measurements (networks of 7 stations over Paris and 2 over Rotterdam were set, and the reports produced will be used as input for the COP 21 event).

A ground-breaking innovation

Current data on urban greenhouse gas (GHG) emissions is based on a "bottom-up approach", namely multiplying the number of emitters by estimated coefficients. This means that the most GHG emission sources cannot be pinpointed nor mapped, and so little can be done to reduce emissions in these areas. Carbocount City objective is to improve the way in which emissions data is recorded, by providing more detailed information on the sources of GHG emissions and enhance city authorities' emission reduction plans.

Societal Impact

A huge percentage of the world's CO_2 emissions can be attributed to large cities. Currently, cities producing particularly large quantities of GHGs are facing trouble to promote their activities in this field notably in international emission reduction schemes, due to a lack of accurate data on the overall quantities of annual CO_2 emissions and their exact source. Current GHG inventories in place are not based on observational evidence. Because of this, it is difficult to identify the areas where their emission reductions efforts are the most effective.

Key Facts

A first contract was signed with Recife in summer 2014. This contract is for a pilot implementation of Carbocount City service over the city. Technical collaboration is currently being implemented & should enable Carbocount City consortium to fine-tune its service & better adjust its business plan.

Discussions with other authorities (cities, but also universities over the world) are ongoing.

Carbocount City aims to provide clarity of information about the areas & sources where actions could be taken by a city to effectively reduce CO2 emissions & better promote its efforts.

The innovation was created within Climate KIC innovation programme and involves the following partner

Université de Versailles, SaintQuentin-en-Yvelines (UVSQ) ▪ TNO (Netherlands Organisation for Applied Scientific Research) ▪ Aria Technology ▪ Commissariat à l'énergie atomique et aux énergies alternatives (CEA)

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Climate-KIC

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CloudCities
Visualize - Analyse - Engage

CloudCities by SmarterBetterCities brings the smart city to life with stunning visualization and decision-making solutions. It has never been easier to share urban projects in 3D on the web. This 3D cloud service will change the way cities are being planned, designed and marketed.

Vibrant networking with the Climate-KIC community

Climate-KIC is an effective knowledge and business resource for smart city planning and operation. Since its inception SmarterBetterCities is engaged in Climate-KIC projects that make cities more resource efficient and carbon neutral. Climate-KIC made SmarterBetterCities highly successful through its intense start up programm and its vast network including customers and innovation partners.

The smarter and better cities of tomorrow

Today, conventional planning, the creation of 3D cities, analytics and management involve time-consuming, inflexible and expensive processes.
Business and government segments suffer from missing systems integration for daily operation, inadequate access to information and slow scenario analytics for decision-making. CloudCities is the treatment.

An intuitive cloud service for cities

SmarterBetterCities delivers solutions for transitioning and managing smart cities. The company's products address the customers' needs by accelerating system integration, offering interactive user frontends to show-off complex information making it easy to plan and manage climate friendly towns and cities. CloudCities - the companies flagship propduct - feature zero deployment or usage-based costs and offer instant returns on investments. CloudCities allows users to share and visualize their smart 3D cities online or together with various data sources. The novel 3D technology and unique product line allow customers to break down disciplinary boundaries and costs.

Societal Impact

CloudCities is dedicated to support cities to create sustainable an liveable places. Our customers are provided with interactive tools that feature innovative 3D web-based technologies and touch-devicebased assessment of urban climate and densification scenarios.

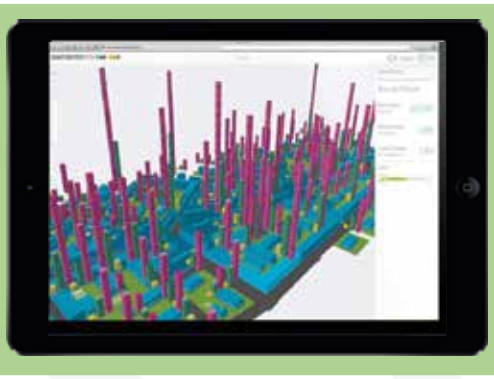
Climate Innovation

Our solutions provide easy to access and understand frontends to complex and big urban data sets. Decision makers can instantly explore urban development scenarios in 3D and access important information such as climate key performance indicators.

Key Facts

CloudCities is a core part of the Climate KIC innovation project Modelling City Systems. It is a product that evolved from SmarterBetterCities - also project within Climate KIC innovation programme- it is on invited beta since late December 2014. Users are actively using https://cloudciti.es to plan and share sustainable urban environments.

CloudCities makes it extremely easy to visualize, analyse and share complex urban information online. A cloud service for cities that only needs a web browser.



"CloudCities and the SmartZoning App enabled us to show the effects of current and future zoning laws in a stunning 3D environment. What traditionally would have taken us days, perhaps weeks, was reduced to hours. This tool is a must have for any developing city." GIS Competence Centre, City of Zurich, Switzerland.

The company SmarterBetterCities was born within Smart Urban Adapt - one of the first Climate-KIC innovation projects. In 2015 Climate-KIC attracted Zurcher Kantonal Bank as smart investor to co-invest into SmarterBetterCities and to close its series A invesment round of 1 million CHF.

Climate-KIC - the accelerator

The CloudCities online service has been a direct result of three major Climate-KIC innovation projects: Smart Urban Adapt, KIC-Transistions and Modelling City Systems. These three projects investigated the need for more systematic and integrated city planning in a pan-European context. A lack of missing visual urban business intelligence was identified. Thus CloudCities was created as a service that helps to easily access and to share urban information with broad audiences. Further CloudCities will become a digital retail space for commercial environmental services through an inbuilt App Store that draws from the rich Climate-KIC partner network.

CloudCities received more than 700 kEUR seed founding over the last 3 years out of projects and commercial activities. CloudCities is since December 2014 on beta. Official release will be July 2015. It generated 6000 views on its contents.

SMARTERBETTERCITIES

The company SmarterBetterCities was founded in 2012 as an ETH Zurich spin-off. It currently has 6 full time positions at its Zurich based research and development office. Another office has been recently opened in Redlands, California. The company foresees huge opportunities for downtown renovations in the US.

SmarterBetterCities strictly understands its business to act as a software company. The ultimative goal is to provide planners and engineers with scalable and process driven tool sets that disruptively change nowadays complicated and segragated planning approaches.

eit Knowledge & Innovation Community Climate-KIC

More information:
https://cloudciti.es
http://www.smarterbettercities.ch
Twitter: @CloudCiti_es, @SmarterBetterC

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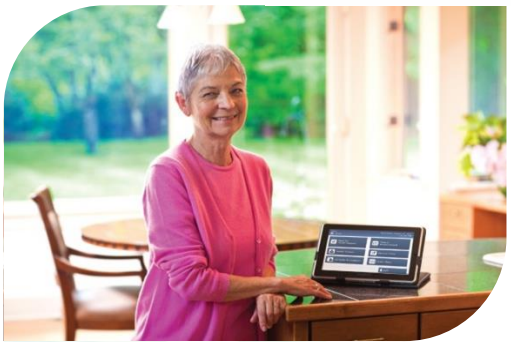
Connected Healthcare Solutions

Accessible Healthcare in Urban Areas



Solutions and Services allowing immediate Access, Sharing and Use of Medical Data for the best action to be taken timely.

The EIT Health

helps in finding partners and connecting key stakeholders from the three elements of the Knowledge Triangle.
This way EIT is a key enabler of elevating industrial results to the best level of utilization, for the benefit of industry, the academics and citizens too.

Key facts

Time to access care varies from 45 mins to 5 hours in European Cities, due to overburdened system and urban traffic. Both can be helped.

A ground-breaking innovation

Solutions improve healthcare and offer a tool for delivering better care by sharing elements - from diagnosis, to treatment and follow up - between multiple caregivers, teaching hospitals, medical students and the citizens themselves, as illustrated on the image at the left.

This contribution empowers patient while reduces the burden of care system.

Societal Impact

Solutions help caregivers optimizing the workload of the institutions and patient flow - avoiding traffic, waiting time, increasing availability of professionals and enable the citizens to be an active participant of their health.

Key facts

~45 minute is the distance between two urban hospitals*
~50 minutes is the average waiting time in most hospitals*
~20% of patients wait more than 3 hours*
~20% of the visits are medically unnecessary*

* Sources: statistics of HOPE, NHS UK, Inrix and TomTom Traffic Index, PubMed

EIT Community contributes to Customization for local needs and Pilots of the solutions, so they will work according to real need of medical professionals and help people.

KIC Innovation Matchmaking and User Ideation Activities are key enablers of the success. CareInnovations™ Solutions and C360 services are partially available, but new solutions will be introduced to market between end 2016 and 2018, based on the results of pilot and development activities under EIT Health. EIT Health helps empowering participants to share knowledge, educating people and allows involving public administration from the very first steps.

Intergative novel Cloud Solutions and Remote Care Management Services designed to ease lives of patients, family and caregivers.

Join EIT Health pilots and project shaping for 2016 – 2017 now.

careinnovations™ an Intel•GE company

More information

http://eit.europa.eu/eit-community/eit-health
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DeBugger

Manure to Energy and Nutrients

We aim to convert farmyard manure and human waste into renewable energy.

Co-operation with KIC InnoEnergy

Thanks to KIC InnoEnergy, Outotec and the University of Stuttgart were able to form a collaboration to work on DeBugger. Furthermore, KIC InnoEnergy's financial support enables the project stakeholders to further develop its innovative ideas into marketable solutions.

Key fact

Farmyard manure and human waste is more than 90% water. But if this could be efficiently evaporated, biomass would be a source of renewable energy. Currently, however, biomass is being inefficiently utilised – large amounts are being spread on fields causing over-fertilisation of soils and over-nutrition of water, resulting in algae.

A ground-breaking innovation

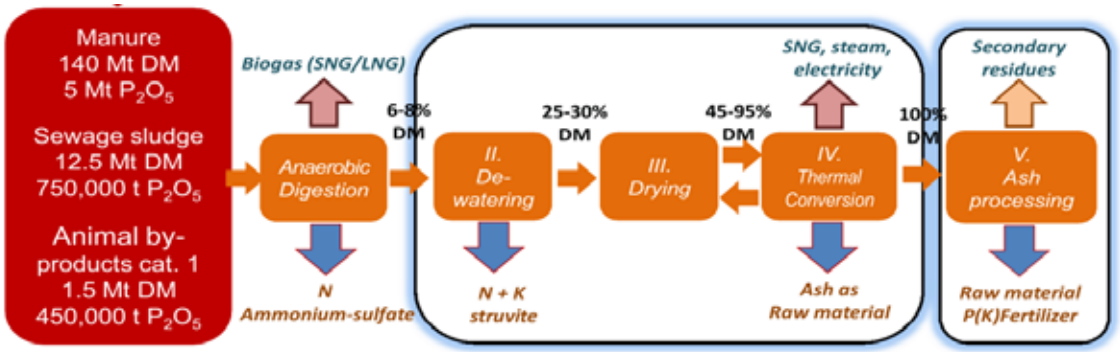
A closed-loop steam dryer has been designed to save half the energy previously required to evaporate the water. DeBugger have also engineered a gasification plant.

Societal Impact

The new biomass conversion system will avoid excessive use of farmyard manure in areas of high livestock density, yield renewable energy and facilitate the use of nutrients where they are needed.

Key facts

Gasification plants convert the dried biomass into a fuel gas, which can be used to produce electricity or transport fuels.



Characteristics and benefits of a KIC/EIT project:

- DeBugger produces energy from chemical fuels.
- Vital for the project was the financial support for test work and the steam dryer pilot plant in Sweden.
- The integrated conversion system is currently introduced to the market – the public roll-out starts with a Resource Recycling and Water Protection Conference in June 2015.
- KIC InnoEnergy is currently the only EU financing tool which is dedicated to the final development and market introduction of a product or system.

DeBugger outlook: combined syngas, heat and power plants with closed loop steam dryer

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ElectricFeel

Driving clean mobility

Data science to help cities build sharing systems with bikes and e-bikes.

Climate-KIC Innovation Project "Diffusion of E-bikes"

The project aims to develop a service that helps cities shift mobility from cars towards e-bikes.
A toolkit, based on ElectricFeel's software, for smart planning of the introduction of e-bike-based mobility systems will be developed and tested with cities.

Cities can still apply.

Bike Sharing on the rise

Close to 1000 cities worldwide have launched bike sharing services in the past ten years, making it the fastest growing transportation system in history. Unfortunately, due to the unpredictable user demand, the systems are very complex to manage. As a result, they remain unprofitable and are difficult to scale, in spite of the increasing user demand.

Artificial intelligence needed

ElectricFeel has developed a software platform that allows cities and businesses to plan and manage bike, e-bike and e-scooter fleets intelligently. ElectricFeel's artificial intelligence algorithms predict user demand and optimize fleet operations. Through an analytics service, better decisions are made and collaboration between cities and businesses is simplified.

ELECTRIC FEEL
NEW ENERGY TO TRANSPORT SYSTEMS

Societal Impact of Traffic

Next to costing the world economy almost 1% of GDP, traffic has the highest negative impact on personal happiness of all daily activities. In addition, transportation is the fastest growing consumer of fossil fuel and source of CO2 emissions.

(Kahnemann 2006, The Economist / INRIX 2014)

E-Mobility

With new light electric vehicles, like e-bikes and e-scooters, the automatic rental systems can provide convenient mobility even in hilly cities and warm climates, and can substitute an increasing share of car trips.

How did the Climate-KIC boost the creation of the innovation?

Moritz Meenen, founder of ElectricFeel, was a participant of the first education programme of Climate-KIC theJourney , which started in 2010. He developed his first version of the business plan on that same learning journey. Inspired by his idea and the six amazing weeks learning about entrepreneurship, he set the building blocks of his startup. Shortly afterwards, ElectricFeel received funding support in the Climate KIC Entrepreneurship program and gained lots of success. Now Moritz is also project manager of the Climate KIC innovation project - Diffusion of E-bikes. Climate KIC programmes enabled the founder to fulfill his dream and establish successful company in the European market.

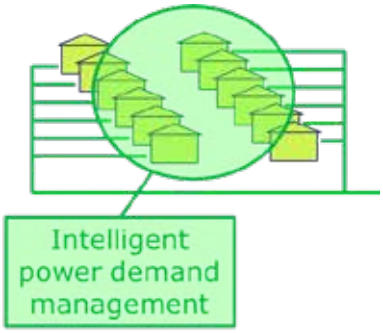
"Since the introduction of ElectricFeel's software, we have increased the number of trips by 33%"

Michael Kraus,
Board of Directors
MVGmeinRad, Mainz
Public Transit Company

More information:
www.electricfeel.com

Esc

Energy supply cooperative



ESC develops energy-autarkic (self-sufficient), environmentally friendly residential quarters.

Co-operation with KIC InnoEnergy

With the help of KIC InnoEnergy, Evohaus GmbH, was able to partner up with Netherland based Organisation for Applied Scientific Research (TNO) and Karlsruhe Institute of Technology (KIT).

Key fact

Photovoltaic systems provide a large part of the required energy within residential quarters. Heat pumps with hot water storage and intelligent load shifting within the quarter enable optimal self-usage of this energy. A smart micro-grid and an intelligent energy management software system are implemented. Local energy supply and demand are optimised.

A ground-breaking innovation

ESC will for the first time establish cooperative energy consumption within a city quarter and prove that zero emission living is feasible even for a low to mid income population.

Societal Impact

With ESC, house owners don't have to be dependent on fossil energy. Instead, they become owners of energy generating equipment and produce their primary energy demand from photovoltaic (PV).

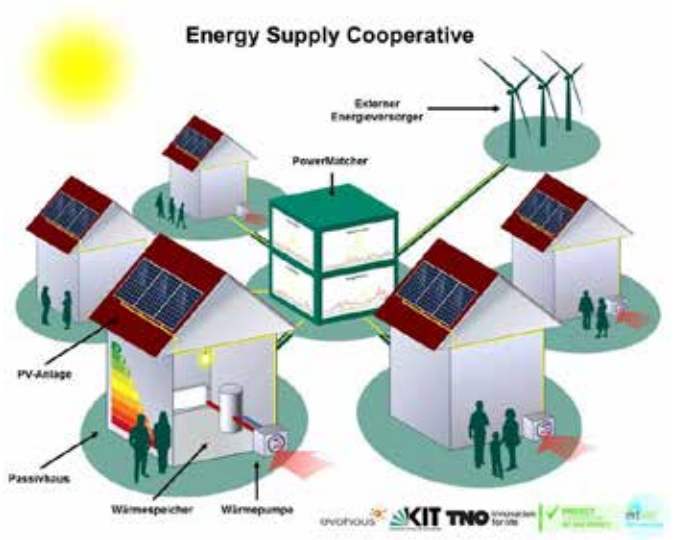
Key facts

- 2 PhD students, 1 master student involved.
- 2 innovative city quarters emerge.
- Commercialization by NewCo / startup.

Esc is linked to the thematic field smart cities and buildings. Two PhD students and one master student are involved. The business innovation will be brought into a start-up company. KIC InnoEnergy provided access to scientific know-how and a supportive framework.

The first residents moved into the pilot in 2014, providing real life data that will be used to fine tune the business concept. Support from the EIT and KIC InnoEnergy enable us to realize two innovative sustainable pilot city quarters with 160 residential units.

Sustainable fossil free living becomes reality for low to mid income population



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Executive Education

Creating Sustainable Cities

The Course was launched end of 2014 and finished in February 2015 with a final presentation with the first 30 participants in London. 8 new ideas linked to improving life in cities and reducing carbon emissions were created. The course took place in Rotterdam, Copenhagen, Paris and London.
Working on the core challenges of sustainable city systems this will be channelled through an entrepreneurial curriculum with systems thinking.

At Climate-KIC our vision is to become the leading global centre of excellence in climate innovation. It is therefore our mission to educate, inspire and empower current, and future leaders for catalysing the creation of a sustainable low carbon society.

In this series of four workshops, you will be challenged to integrate the technological and commercial expertise in the private sector with that of the public sector focusing on the topic of sustainable cities.

The course equips participants with a thorough understanding how to accelerate their ideas in order to reduce time-to-market for new products and services, offering a holistic approach to transition management with an entrepreneurial curriculum, interactive workshops, relevant site visits and plenty of networking opportunities.

During the fourth module of the course,the participants will learn best-practice for executing sustainability projects. The module includes discussions on business model for sustainability and well as the individual role the participant and the organisation will have in making it happen.

The course is created with the support of Climate KIC's partner network - DTU Copenhagen, Imperial College London, Institute for Sustainability, CDC Climat, City Port of Rotterdam.

In this pilot series of four workshops, 25 participants from around Europe are being challenged to integrate the technological and commercial expertise in the private sector with that of the public sector. The course focusses on sustainable cities.

After an introduction to transition management and some best practice examples in Amsterdam and Rotterdam, the participants met again in Copenhagen to gain insights in the topic of value proposition.

The programme in Paris focused on target markets, with the final sessions taking place in the Siemens owned and operated The Crystal sustainable cities showcase complex in London this weekend.

Societal Impact

In the Climate-KIC Sustainable City Systems we explore this opportunity space to see how private companies can create public successful businesses and how public decision makers can create long-term advantages from being an early mover on sustainability.

Climate Innovation

A high-calibre executive level education course bringing together relevant European leaders and change agents of the commercial and public partners of Climate-KIC.

Key Facts

Knowledge and skill transfer from the Climate-KIC community ▪ Development of executive thinking ▪ Leverage the potential for innovation and change in your organisation ▪ Benchmarking opportunity For You as Individual ▪ Personal development ▪ Opportunity to update and sharpen your professional and executive profile ▪ Learn and apply effective and collaborative methods of leadership ▪ Be part of a vibrant network

The majority of the world's population lives in a city and the prospect of this trend will only intensify more so focusing on sustainable solutions for urban life is of paramount importance. We want to make transitions happen and ask you to help us shape this education offering with your own learning experience.

Pilot programme with high-level speakers

The course is a pilot of Climate-KIC's executive education offerings, which are going to be fully rolled out in the second half of 2015.

The pilot included a number of renowned speakers in the field of sustainable cities and transition management like professor Derk Loorbach, who is the director of the Dutch Research Institute For Transitions (DRIFT) and Professor of socio-economic transitions at the Faculty of Social Science at the Erasmus University Rotterdam and Frank G. Rieck, chairman of the Dutch Innovation Centre for Electric Road Transport (D-Incert)

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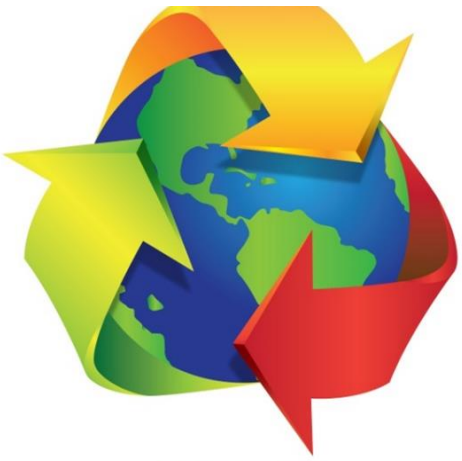
Extracting value out of the urban mine

Smart use of residue stocks



The **urban ecosystem** holds vast amounts of **unused material stocks**, containing high value materials. These products typically have a low apparent value and high complexity.

By recovering in a sustainable way valuable materials from **currently unused residue stocks**, resource efficiency of the urban ecosystem can be increased and **material cycle closure** improved.

EIT Raw Materials will offer an **innovative service package** for residue owners. This package will provide owners with the opportunity to realize the **true value** vested in residue stocks. **Novel technologies** – developed by partners of EIT Raw Materials – will be applied that are both **feasible and environmentally benign**. This will require a **new level of cooperation** between stakeholders from different parts of the **value chain**. Metal refiners and companies active in marketing added-value building products will enter **multi-stakeholder partnerships** with residue owners.

Societal Impact

Significant volumes of **secondary raw materials** will become accessible, thus establishing an alternative supply for European Industry. At the same time, **environmental and economic impact** of residue stocks will be minimized. The **EIT Raw Materials Academy** will play a key role in the **dissemination of new insights** on material recovery and urban mining.

EIT RawMaterials

EIT Raw Materials is supported by the EIT, a body of the European Union

EIT INNOVEIT 2015

FASCOM

Future solar street lighting

FASCOM is a compact and 360º oriented solar street light conceived to redefine the current concept of street lighting.

Co-operation with KIC InnoEnergy

KIC-InnoEnergy gave the training and economical support for analysing the market and defining the business model for the commercialisation of FASCOM.

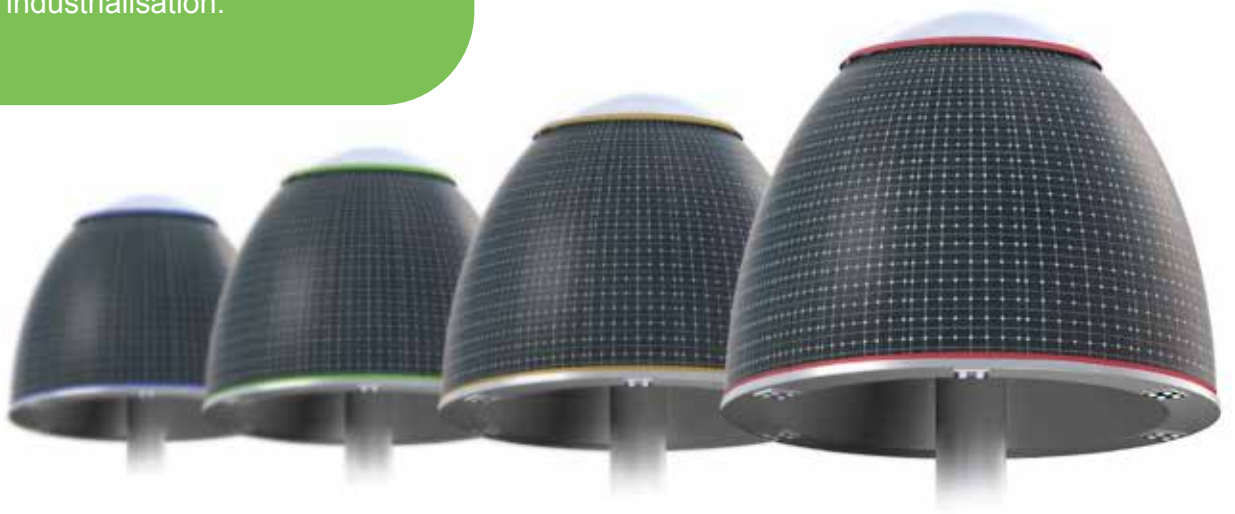
Now KIC InnoEnergy is supporting the 2nd phase of R&D, providing the funding needed to reach the validated prototype and the plans for industrialisation.

Key fact

FASCOM is a perfect combination of high technology and elegant and precise design. It creates a real alternative to the current street lighting systems adding the integration of solar energy.

A ground-breaking innovation

FASCOM is a compact and 360º oriented solar street light conceived to redefine the current concept of street lighting.



Societal Impact

FASCOM renews the concept of solar lighting. This product proves that a solar street light can be a high design and technological product. At the same time it generates energy in a responsible way with the environment.

Key facts

- Reduction in costs of the metallic structures that normally compose a PV streetlight.
- Reduction in weight and volume of the photovoltaic streetlight.
- FASCOM will be available in 3 versions: Stand alone, Grid connected and Smart cities.

EIT and KIC InnoEnergy has made the development of the FASCOM project a reality.

- FASCOM project is linked to the activity of supporting and fostering Renewable Energies in our cities.
- A stand-alone version will be introduced in the market in spring 2016.
- The development of the FASCOM project is possible today thanks to the support of FP7 (www.solar-design.eu), the EIT and KIC InnoEnergy through the platform “Innovation projects”.
- Thanks to this support the solar lighting in our cities will be very soon a reality!

“KIC is a good tool for partially financing products and services under development but very close to the market.”

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FlashPoll

For a mobile citizen participation

FlashPoll is a mobile solution to involve citizens into the decision making processes of a city.

Co-operation with EIT ICT Labs

FlashPoll has been developed as an innovation activity into the EIT ICT Labs Urban Life and Mobility Action Line since 2013. A multi-disciplinary consortium made of large and small companies, research institutes and universities has been working altogether on the project.

Classical representative democracy is being criticized for its lack of effectiveness. Disenchantment with politics is rising while vote participation is going down. At the same time and thanks to new technologies, people feel the need to participate.

FlashPoll is transforming public participation by giving territorial governance bodies (such as cities, regions or countries) access to a unique way to build a smarter relationship with their citizens.

An advanced geo-location technology allows to send polls to citizens when and where it is relevant to them, in an anonymous way and through a simple mobile application.

Societal Impact

Citizens want to shape the places they live in and get asked how to shape them. FlashPoll provides a solution to get directly in touch with citizens where it matters: the places they live in or go through.

People should feel that they benefit from their participation by being change-makers. This is the best motivation to make them participate the next time.

The use of FlashPoll to improve both internal administrative processes and relationships between government and citizens is dedicated to more flexibility and more transparency.

"Houses make the town but citizens make the city."
– Jean-Jacques Rousseau, 18th century philosopher

For this innovation activity, EIT ICT Labs built up a multi-disciplinary consortium of experienced citizen participation practitioners, computer scientists researchers and dynamic entrepreneurs from various countries in Europe. It included the whole chain of competencies from the very beginning. This helped turn FlashPoll into a new urban service and develop new citizen behaviors.

Perspectives

The FlashPoll innovation activity which evolved into a startup in 2014 is now going to reach large European public bodies as the next level. Large scale polls are expected to happen by the end of 2015.

In collaboration with

Service-centric NETWORKING · Mairie de Paris · KTH · Alfstore · Quality & Usability Lab · nexus · Stockholm University · SIEMENS

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FLOWBOX Project

Competitive Energy Storage

The objective of the FLOWBOX project is to evaluate a new “Flow battery” technology and to prove its ability to reach the market target. The validation is focused on the technical and economic feasibility.

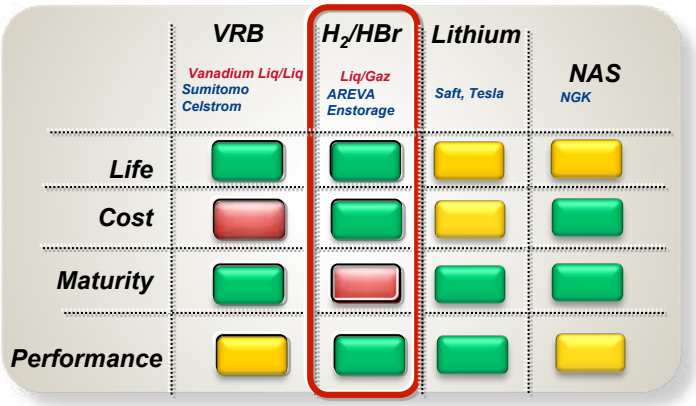
Creating a new business based on a co-operation within the KIC InnoEnergy network.

The project consists of the following consortium:

- Site testing
- Regulation & safety
- System integrator
- End User
- Supply Core technology
- Supply the Power Conversion

Project Key facts

⇒ Renewable Energy Integration
⇒ Grid Services
⇒ Industry Energy Cost Optimisation



Societal Impact

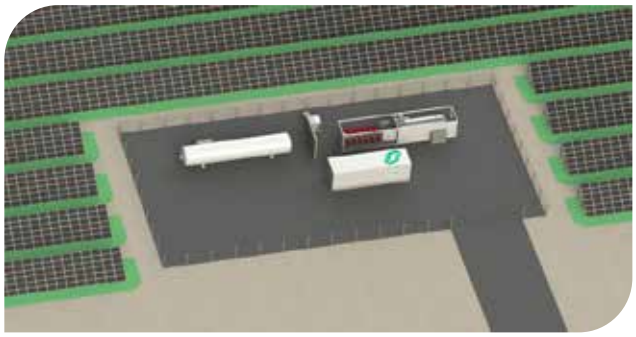
Participation to energy transition by allowing the growth of Renewables integration in networks thus reducing the world CO_2 global emission.

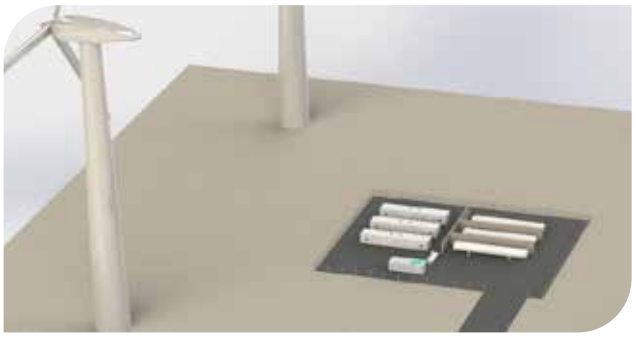
Creating a European Flow Battery industry.

Innovation Key facts

A core technology made with standard – on the shelf materials.

An Integrated system in transportable standard containers mastering all safety, thermal and process issues.

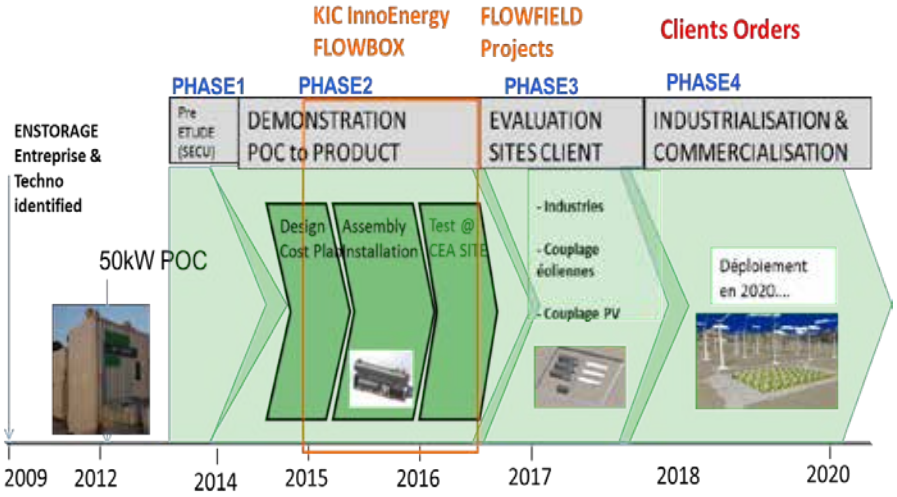




For the market entry, KIC InnoEnergy supports the consortium by:

- Financing this crucial R&D phase for the technology validation.
- Proposing and efficient methodology compatible with in house AREVA view.
- Organising regular follow up meeting to keep an external view on market needs.
- Offering flexible tools for project management.

EnStorage Proof Of Concept Installed and running since 2012



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GrowUp Urban Farms

3 Less waste and fresher food, which lasts longer

GrowUp Urban Farms produces sustainable food for a local market, using a combination of aquaponic and vertical growing technologies to maximise yield in urban spaces.

Kate Hofman (GrowUp co-founder and CEO was a participant in the Journey programme 2011, where she first came across aquaponics and urban farming. Inspired by potential to bring this innovation to the UK and make it commercially profitable, she founded GrowUp Urban Farms with Tom Webster. GrowUp joined Stage 1 of the Climate-KIC accelerator in 2013 and participated in the Venture Competition 2014 in Valencia. The company has also recently finished hosting their first Climate-KIC Masters programme Mobility intern, who is now joining the company full-time.

The way we grow food is unsustainable.
With a growing global population and 80% of people expected to be living in cities by 2050, there's a serious problem with a food system that already uses 50% of all available land, 70% of fresh water, creates 30% of man-made greenhouse gasses and then guess what? At the end of that we waste half of everything we've grown.
We are addressing the fundamental flaws in our agricultural system by using aquaponics and vertical growing to produce sustainable food for a local market, by building farms in cities.

Aquaponics

Aquaponics is the combination of two well established farming practices:

- quaculture – which is farming fish, and
- Hydroponics - growing plants in a nutrient solution rather than soil.

We take the waste water from the fish farm, pump it through a hydroponic growing bed where our salad plants and herbs absorb the waste nutrients and clean the water for the fish. The whole system continually recirculates.
Our farms use 90% less water and 50% less energy to grow twice as much food per m2 as traditional farming. We produce delicious salads, herbs and fish without any chemical fertilizers.

A ground-breaking innovation

This innovative way of feeding people in cities has the potential to lower the environmental impact of agriculture by growing food closer to consumers in a resource efficient system that can be built in cities. GrowUp Urban Farms is pioneering aquaponics in a controlled growing environment and creating a model for food production that can be scaled to any city.

Societal Impact

GrowUp Urban Farms will create jobs in places that need them, and will need them increasingly in the future as city populations expand

Our aspiration is to employ young people who may have dropped out of formal education or been unable to find employment, and provide them with the skills, experience and confidence to work in urban farming or develop transferable skills to help them move into the area they want to work in.

We also work with schools and other educational initiatives, which have a positive impact on local communities.

We also work with schools and other educational initiatives which have positive impact on communities.

Urban Farming

In view of the trend towards urbanization, food security is becoming an increasing focus for Governments.
Feeding people in cities by farming in urban spaces can reduce the environmental impact of agriculture by growing food closer to consumers and reducing imports.

Cities are an ideal location for aquaponics as the crops that grows best with the nitrogen rich waste from fish, are perishable leafy salads, herbs and microgreens. The produce is then delivered by electric van to local customers within 6 hours of harvest.

The result is less waste and fresher food, which lasts longer.

This year we will build London's first commercial scale aquaponic farm, capable of producing 20,000kg of salad and 4,000kg of fish each year.

Farms are designed for year-round sustainable high-density and high-yield commercial food production in low-carbon cities. With a growing cycle of 6-8 weeks year-round, crops can be grown to order and delivered to customers within 6 hours of harvest.

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I3C

Autonomy, Security, Control Cities

Intelligent Integrated critical Infrastructures
for smarter future Cities

Co-operation with EIT ICT Labs

The Cyber-Physical Systems Action Line of EIT ICT Labs is supporting I3C. EIT ICT Labs' support made it possible to gather together the unique team of tech-experts and business people, spanning academia and industry, that contributed to this innovation. EIT ICT Labs was instrumental to bring together technological advancements from different sources and diverse funding schemes (private, local, regional, national and European), towards a highly focalized goal.

I3C centrally visualizes, monitors and controls distributed critical infrastructures, e.g. bridges, roads, railways, tunnels, water and energy infrastructure. I3C uses cloud-connected wireless sensors and actuators with the ability to power themselves indefinitely by harvesting energy from the environment, such as the sun or the wind.

I3C makes it quicker, easier and cheaper for authorities and industries to understand what is going on with their infrastructure, letting them manage risk and maintenance in new ways, improving situational awareness and operational expenditure across the board.

There is no comparable ultra-low power wireless sensing and control technology on the market that can compete with the speed and quality of I3C. Our first major target is structural integrity monitoring, e.g. continuously monitoring condition of suspension bridges. For it, we have developed the right technologies and have tested the system in the real world.

Once on the market, the fully integrated I3C products features:

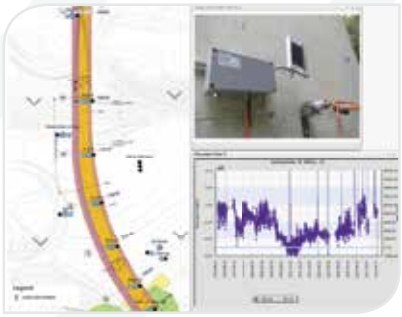
- Aggregation and integration of critical data for near real-time situational awareness and more responsive remote control
- Real time-visualisation and analysis for improved failure prediction and support to decision making
- Provisions for proactive planning and emergency management

Societal Impact

The product will contribute to safer, more reliable, and more effectively managed critical infrastructures. This has a number of added benefits, both in societal (greater citizen safety) and in economic terms (safeguarding infrastructures to sustain and grow businesses).

Key Facts

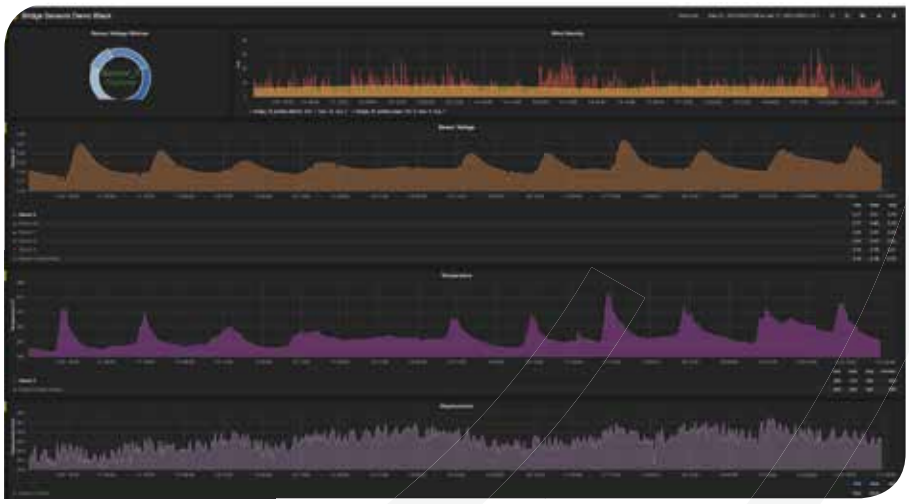
I3C has one stealth-mode start-up, which has begun its revenue generation strategy with a view to generating turnover in 2016 through the sale and provision of hardware and managed services. In line with original projections, wider market introduction is forecasted for 2017.



Achievements

- Actionable go-to-market approach and founded start-up in 2015 based on state of the art energy harvesting networked sensors and actuators
- Best-in-class information management, representation & decision support system for networked CPS
- Novel monitoring and control devices and protocols for real-world water monitoring and control – with demonstration deployment/test-bed in the UK in 2016
- Enhanced test-bed facilities at the Trento Lab Tunnel; with spatially correlated deployment of heterogeneous monitoring & control systems in 2015

Number of start-ups created: 1



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Intelligent Outdoor Lighting

Smart city services

Intelligent Outdoor Lighting offers cities an end-to-end solution enabling smart services

Co-operation within KIC EIT ICT Labs

EIT ICT Labs Smart Spaces Action Line brought together Philips Research, Technical University of Eindhoven and ST Microelectronics to create sensor-driven innovations to enable smart city services.

Cities understand the advantages of branding themselves as unique, beautiful and secure places. Lighting plays a special part in establishing that identity. Smart urban lighting management solutions provide improved energy efficiency, user experience and safety feeling.

Embedding sensors within the intelligent lighting network enables data-driven innovations. Sensorial information gives more insight in what is happening in urban environments. Next to light control tailored to citizens' needs, monitoring environmental conditions creates more awareness. Insight in traffic patterns results in more efficient usage of urban spaces.

EIT ICT Labs built a consortium able to bring this proposition to the market. The embedded sensing platform from STMicroelectronics and TU Eindhoven's data analytics are deployed into the Philips intelligent lighting infrastructure to create this unique solution. Besides technological aspects, this activity is also targeting co-creation together with cities.

The innovation activity was selected in 2013 by the EIT ICT Labs' action line Smart Spaces as one of the most promising proposals.

Societal Impact

Environmental awareness (e.g. air quality) will lead to increased societal consciousness creating healthier living environments.

Benefits for cities and citizens

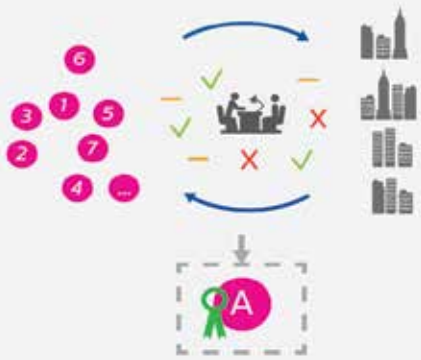
- Intelligent light control
- City monitoring
- Energy efficiency
- Public safety

Key Focus Areas

The consortium has identified key focus areas and is reaching out to European cities for co-creation. Claim validation pilots of the prioritized propositions will be carried out in the market in 2016.

1

Discuss **focus areas** with European cities to **prioritize** and find a **partner for co-creation** and pilot implementation



- Interviews with 4 European cities
- Goals of interviews:
  1. Prioritize and validate ideas
  2. Find partner to start co- creation
- No requirements in terms of numer of inhabitants

Individuals to discuss with:
- Should have responsibilities in the pu+- domain (safety, economy, mobility, natural environment)
- Decision makers
- Experts in their fields
- Conceptual, visionary thinkers
- Responsible for policy making
- In direct contact with assemmen

- NO- purely lighting
- NO- purely operational

The first step is to discuss with European cities in order to verify the need spaces, focus areas ( ) and to understand the underlying needs and the priorities. Based on the discussion, one focus area will be selected ( ). Besides this, we also need to find a partner to enter the co-creation phase.

2

Co-creation with European city to develop a full digital service proposition and start preparing **claim validation pilot**

After a city has been selected as a partner for co-creation, the consortium will work together with the city to further develop the selected 'focus area' ( ) into a full service proposition that includes business model, service design, etc ( ). This will be the basis for a small-scale pilot test which aims to validate the underlying claims of the proposition.

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Mobile 3D Visual Search

Identify objects with your mobile device

Mobile 3D Visual Search lets you identify 3D objects like buildings with your mobile device just by taking a photo of it.

Co-operation with EIT ICT Labs

The Royal Institute of Technology KTH in Sweden, Fraunhofer Heinrich Herz Institute in Germany and eDiam Sistemas from Spain have further developed the technology and the Mobile 3D Visual Search application under the EIT ICT Labs Smart Spaces Action Line.

Imagine being a tourist in a city where you have never visited before. How easy would it be to find out information on interesting sites just by taking a photo of it and getting the answer back on your mobile in just a few seconds. Or while watching a fashion show to buy the outfit you like just by taking a photo of it.This is exactly what Mobile 3D Visual Search enables you to do!

Most visual search solutions used on mobile devices identify real world objects as if they were just bi-dimensional / picture-like flat surfaces.

Our novel solution goes beyond that by addressing objects' three-dimensional nature. This way, it considerably improves the accuracy of the search and increases the chances that what you are provided with is exactly the answer you were looking for.

Our search solution has huge potential in many different sectors like marketing, tourism, video games, or robotics.

Societal Impact

Tourism and marketing will benefit widely from this novel solution. Self-driving cars could be the next big thing benefiting from 3D search.

Key Facts

1. Novel search solution based on 3D visual information.
2. First 3D solution on the market.
3. Commercialized by the Spanish eDiam Sistemas.

"Our search solution has huge potential in many different sectors like marketing, tourism, video games, or robotics." – Markus Flierl, Associate Professor, KTH

The technology was developed and demonstrated thanks to the support of EIT ICT Labs Smart Spaces Action Line. The partners of EIT ICT Labs working together were the Royal Institute of Technology (KTH) and Fraunhofer Heinrich Herz Institute. The project partner Spanish SME, eDiam Sistemas, is commercializing the product.

In cooperation with

Fraunhofer

KTH VETENSKAP OCH KONST
ROYAL INSTITUTE OF TECHNOLOGY

EDS EDIAMSISTEMAS

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Mobile AR for City Planning and Digital Services

Mobile Augmented Reality (AR) allows architects, citizens and other stakeholders in the city planning process to see how planned buildings would look at the real location.

Co-operation with EIT ICT Labs

EIT ICT Labs' Smart Spaces activities Mobile Urban Augmentation (2013) and Street Smart (2014) enabled maturing the technology into an easy-to-use end-user application. Among the participating partners, Nokia contributed to the mobile phone and tablet implementation while Tampere University of Technology and Forum Virium took charge of customer relations and user tests.

Increasing understanding of city plans

The application allows different stakeholders in the city planning process to better understand the impact and evaluate alternatives of new building plans.

Compared to traditional methods, mobile AR allows the user to choose the view point arbitrarily from any location, e.g. from the yard or window where one is currently positioned at. Architects can understand the mass of planned buildings much better by "being there" on site than at the office. All this brings about improved planning and increased democracy, as well as time and money saving in the land use process.

Fully automatic solution for augmenting buildings

Our solution is far more advanced than any other on the market. Compared to competing systems, we offer fully automatic solutions for accurately augmenting the buildings at the right place.

Societal Impact

Using mobile AR in city planning will lead to improved planning and efficiency. Showing citizens "the real view" of the building site will lead to greater acceptance.

Key Facts

The mobile AR technology can also be used for other applications like visualizing historical photos of the city and providing richer information on tourist attractions.

"We plan to offer Helsinki citizens applications that will enable to explore the future plans of the city through augmented reality."
– Pekka Koponen, Development Director from Forum Virium Helsinki.

The mobile AR technology has been matured and piloted with the support of the EIT ICT Labs' Smart Spaces Action Line. The first public application took place in 2013, after which several commercial building visualizations have taken place both in Finland and Sweden.

The application is currently made available on a per-project basis by VTT. Packaging the application into a publicly available product requires still a further development step.

With EIT ICT Labs support, business development actions have been carried out with Italian SME Inglobe Technologies srl, international distributor of VTT's core tracking technology.

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Mr.CySeMol

Proactive Cyber Security

Tool helping companies proactively manage cyber security across complex IT architectures, such as Smart Grids

Co-operation with KIC InnoEnergy

KIC InnoEnergy funds development of the tool through a consortium including Foreseeti, Royal Institute of Technology, Stockholm, and paluno, University of Duisburg Essen in close collaboration with end users as ABB. Critical infrastructure companies is a first priority industry for the product.

Key facts

The cost of cybercrime is rapidly increasing. With increasingly complex interconnected IT-systems, it is ever more important to manage security holistically. Today, this is typically done through manual expertise which are scarce, expensive, and subjective – leading to high risks and costs.

A ground-breaking innovation

The securiCAD tool helps understand, prioritise and proactively manage cyber security across complex networks. Based on state of the art research and taking a holistic approach, the tool provides quantitative, actionable output. What's more, the user doesn't have to be a security expert.

Societal Impact

The tool helps companies improve cyber security in the most effective way. This creates improved security in society and is a critical requirement of development towards smart grids.

Key facts

Global cost of cybercrime amounts to 300-1.000 BUSD, and is rapidly increasing.

The energy sector is seeing a specifically rapid increase in cyber crime.

KIC InnoEnergy is a vital enabler

KIC InnoEnergy funds the development of the tool through the project MrCySeMol, where a consortium including Foreseeti, Royal Institute of Technology, Stockholm, and paluno, University of Duisburg Essen improve the tool from a well-functioning research product towards a market ready product in close collaboration with end users as ABB. The support from KICInnoEnergy was absolutely vital to create the startup company and commercialising this state of the art research product.

"The KICInnoEnergy programme was absolutely a vital enabler for us to commercialize our research"

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MSc Energy for Smart Cities

Engineering global change

A KIC InnoEnergy Masters programme for internationally-oriented engineering students.

Co-operation with KIC InnoEnergy

MSc SMART CITIES is a joint programme run by six European universities involved in the framework of KIC InnoEnergy.

Key fact

This programme balances technological opportunities with the environmental and socio-economic aspects of smart cities.

A ground-breaking education

Graduates will be truly multi-disciplinary; well qualified to work in research or in industry, or to take on policy-making roles in energy issues related to the cornerstones of contemporary society – secure, sustainable urban living and working.

Societal Impact

All our programmes deliver high quality content, covering a range of subjects considered crucial to meeting today's global energy challenges.

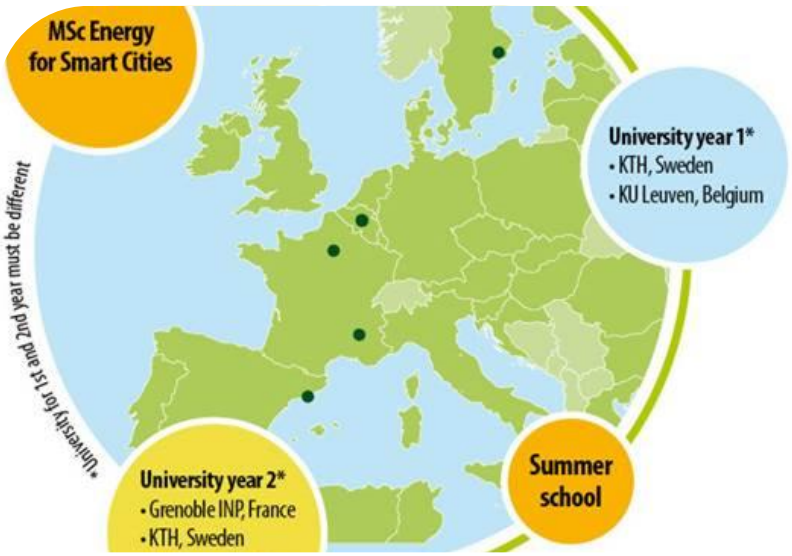
Key facts

- 93% of KIC InnoEnergy Master School graduates secure a job within 6 months of graduating and they earn on average 15% more than their peers
- Our choice of 7 programmes are hosted by 11 leading universities across Europe.

- Bridging Energy technologies with real-life context working with industry and stakeholders in Cities, via in-company master thesis, guest teachers, practical hands-on projects in courses, networking and visit international expos.
- Integration of a broad diversity of solutions in the interdisciplinary City "Energy" ecosystem, generating hybrid ideas and fostering entrepreneurship.
- Large knowledge community building together with first and second year students, Alumni, PhD students, teachers, business creation team, start-ups and industry in courses and competitions.

"Versatility, entrepreneurship and international experience"

Graduate, Joeri Siborgs



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KIC InnoEnergy

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MTT micro CHP

Affordable heat & power

A small distributed energy system generating electrical power and heat, based on an efficient and reliable in-house developed gas turbine.

Co-operation with KIC InnoEnergy

Intelligent and energy efficient buildings and cities program

Partners:
Micro Turbine Technology (NL), Eindhoven Univ of Technology (NL), TNO (NL), EDF/Eifer (DE), Eandis (BE), IREC (ES)

Key fact

The MTT micro CHP is a Micro Combined Heat and Power system that produces warmth and electricity for domestic use.

A ground-breaking innovation

- It is built out of commercial off the shelve components, thus allowing for a relatively low price.
- Weight, maintenance and cost are lower than any other micro-CHP solution.
- Based on a compact engine which combines micro turbine and an electrical generator.
- The MTT micro-CHP system *EnerTwin* is expected to be on the market by 2016.

Societal Impact

- MTT is an alternative way for customers to provide their house with warmth and electricity.
- Highly load and fuel-flexible μCHP is the enabling technology for clean and affordable energy generation.

Key facts

Compared to solar PV, solar heating and wind energy, micro CHP is a controllable form of energy generation, which is an important advantage in the decentralised energy supply.

Within its *Intelligent and energy efficient buildings and cities* programme, KIC InnoEnergy supported MTT's field-trial programme and financed the critical system development phase from prototype to commercialisation. KIC's support substantially reduces risks for other investors. In parallel to the product development, new and improved technology could be developed that will further optimise the micro CHP application, and thereby strengthening its business case.

"With the EnerTwin we can offer our customers added value"

"Customers have a short payback time on their investment"

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OASIS

Open access catastrophe modelling driving adaptation to enable resilience in an uncertain future

Climate-KIC's role as an engine for ideas, innovation and Pan-European, public-private partnerships has acted as a fundamental driver for the development of the relationships formed under the Oasis Project and these opportunities would have been difficult to find elsewhere.

With the frequency and severity of natural disasters increasing, the cost of catastrophe loss is soaring and governments, corporations, aid organisations and tax payers are left to bear the costs. OASIS has developed a new open-source loss modelling framework and catastrophe (CAT) and climate models that addresses the uncertainty of natural disasters, calculates potential losses & impacts that assist society to plan for and underwrite these events and combats the setbacks of existing models.

A ground-breaking innovation

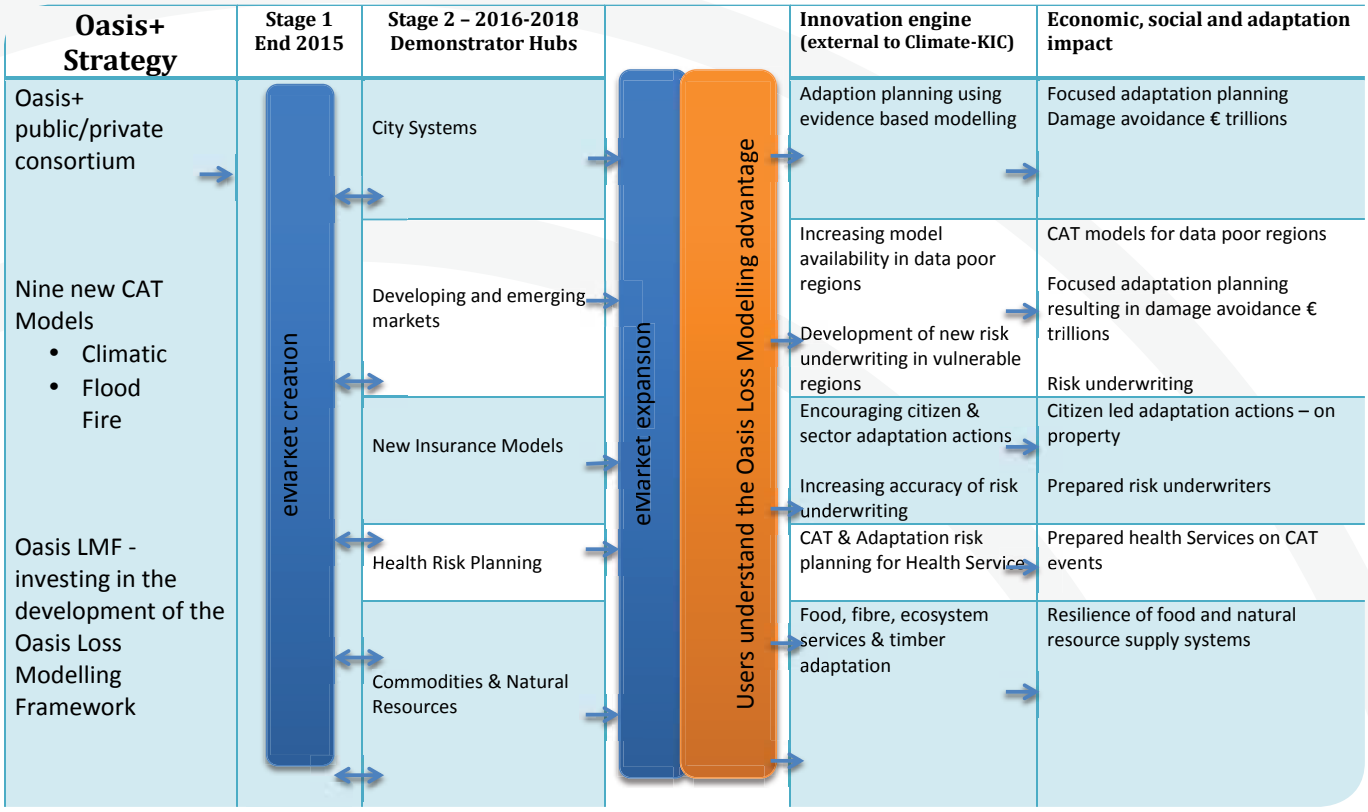
The Oasis consortium is the foremost Pan-European, public-private CAT and Climate risk modelling innovation partnership working towards providing open-access and transparent CAT and climate models for the marketplace. Using Oasis Loss Modelling Framework standards, the hazard, vulnerability, probabilistic and damage models we develop can be used within the Oasis framework to assess potential financial losses accordingly. Because of our multiple partners we can work flexibly on modelling of a bespoke nature for potential customers, including city planners and industry but then releasing these models onto our eMarketplace for general use by other potential users.

Because our models will publish their modelling assumptions they can be used more transparently to assist city and regional planning and underwriting risk.

Our programme is intended to cause a market disruption of the current 'black box', prohibitively expensive CAT modelling market, bringing more open and transparent models to the market, opening up new markets in different sectors and encouraging new modelling entrants into the marketplace and in the long run decreasing the cost of models. Used effectively our models can assist adaptation planning and the understanding of climate and CAT risk, potentially saving lives and preventing damage to property and infrastructure.

Our successes include:

- Capital attracted (3M€ membership fees)
- 2 x Sustainable spin out's created
- Creation of Oasis Loss Modelling Framework
- Creation of nine new climate, flood and fire CAT models
- Already generates revenue for partners (240k€)
- Received two industry awards in 2014
- Three PhD's
- Ten published scientific papers



"Our ongoing relationship with Climate-KIC has been essential. It has helped to galvanise the industry and provide the opportunity for large numbers of participants to enter the market."

Ralf Toumi – (Professor of Atmospheric Physics), Imperial College, London

What is the innovation?

OASIS was originally a 3-year project funded by Climate-KIC, during which time, as part of the original innovation project a range of CAT modelling tools including the Oasis Loss Modelling Framework (OASIS LMF) was developed. OASIS LMF is an open access, plug and play, calculation kernel that calculates damage and financial risk from catastrophic events now supported by 44 major insurers and reinsurers and a spin-out company Oasis Palm Tree Ltd, providing education and services around the Oasis system. The Oasis consortium of research institutions and business partners also created nine new climate, flood and forest fire catastrophe models for the market place and in doing so developed skills for the development of high quality CAT and climate models suitable for the market place.

Of course, the financial support for the original innovation project has been important both to seed fund the kernel, now being supported by Oasis LMF members and for stimulating new CAT model development. The ability of the KIC to act as a high risk investor in adaptation service development has resulted in stimulating growing interest in more accurate and transparent CAT and climate models. Their investment has now given us the ability to act as a serious and established consortium able to attract both commercial and leverage funding for programmes.

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Raw materials solutions for a sustainable urban society

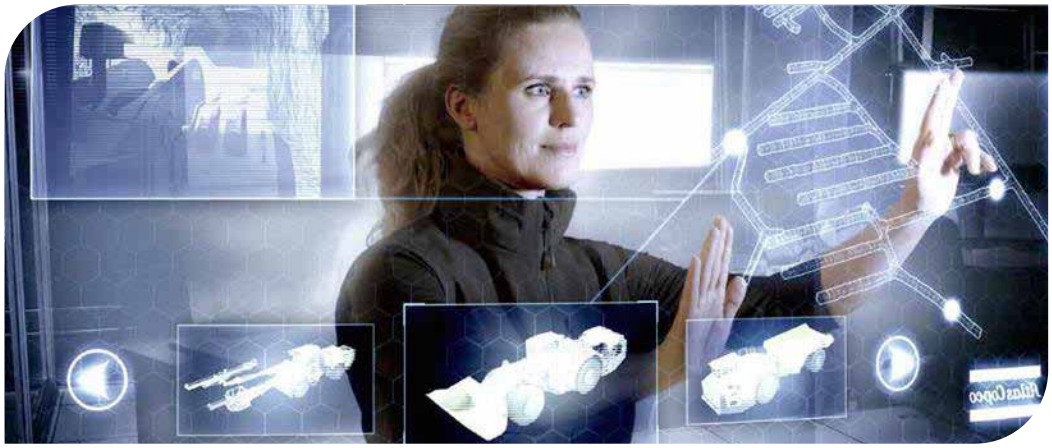
Smart Mining Solutions

The availability and use of **primary raw materials** remains a pre-requisite for **modern urban ecosystems**. Being an essential component in this ecosystem, **mining operations** are increasingly required to **prove their sustainability.** This pertains – in particular - to aspects of resource and energy efficiency, as well as environmental footprint and safety performance.

Delivering innovative technologies, solutions and services

Through systemic integration of ICT-solutions, the EIT Raw Materials aims at **accelerated innovation, resulting into tools, equipment, machinery, methods, processes and services to enable effectively controlled highly efficient and safe mining operations.**

The ultimate goal is a mining operation that performs as a local Internet-of-Things. Realization will require close cooperation of actors from all corners of the knowledge triangle in **EIT Raw Materials** with **leading partners in the ICT and manufacturing sectors**. Technology solutions for full automation, reliable remote control and machine-to-machine communication in the harsh mining environment will be the stepping stones of innovation. Successful market introduction will be accompanied by **EIT Raw Materials Academy** offerings in *life long learning and entrepreneurship.*



Societal Impact

By developing innovative technologies, solutions and services the **EIT Raw Materials partnership will enable mining** with very limited **environmental impact** and **superior safety performance. Industrial deployment** will greatly **improve sustainability** of European mining operations and **enhanced global competitiveness** of **European technology providers**. **Affiliated industrial sectors** will benefit form **reduced dependency on raw materials imports**.

EIT Raw Materials is supported by the EIT, a body of the European Union

RENJET

Renewable Jet Fuel Supply Chain and Flight Operations

The innovation pillar of Climate KIC supports the processes in the RENJET project and allows its adaptations to secure success. The project will be supported by Climate-KIC unto 2017. By then, spinouts should have found their ways and be supported by other investors. The first tangible spin-off is expected to gather traction in Q4 of 2015, with the implementation of the core supply chain development activities in 2016. The project will then culminate into signing the off-take agreements for ASTM certified Bio Fuel and the initiation of the realisation of the first supply chain.

The RENJET project accelerates the development of sustainable Bio Fuel supply chains that may account for 20% of jet fuel demand in the European Union in 2025. The project develops knowledge, practises, procedures and tools, tests and pilots them, towards the overall goal of a self-sustaining networks of regional renewable jet fuel supply chains throughout Europe and beyond. The activities range from selecting and expanding the supply of availablefeedstock(s), managing stakeholders and conversion steps, support ASTM certification up to signing offtake agreements for certified Bio Fuel and defining business models taking all stakeholders into account.

A ground-breaking innovation

History has proven transport is part of our lives:business, leisure and goods. But it also enables us to explore other cultures, art, ideas and built knowledge and understanding. Globally, aviation is considered the only transport mode to be the only transport mode to bring people together, to do business or to enjoy ourselves during holdays. It is expected that global air transport will grow around 4% annually. Today, aviation accounts for more 2% of global CO_2 emissions. Forecasts show it may rise to approximately 3-5% of global CO_2 emissions by 2050. The environmental impact of fossil fuel combustion and the insecurity of affordable and stable fuel prices constitute serious risks to a sustainable future in aviation.

Renewable jet fuel is seen by the industry as an essential contribution to their transition. Compared with conventional jet fuel, renewable jet fuel will deliver life-cycle CO_2 reductions up to 80%. Today fuel makes up about 30% of an airline's cost; with the volatility of fuel prices and fierce international competition it is hard for airlines to generate stable profits. This leaves sparse possibilities to invest in renewable jet fuels as these are three to four times as costly.
Ground-breaking is the approach to overcome this challenge, stakeholders from the triangle and envisioned partners in a supply chain have joined their efforts to move forward together, trying to prevent a well-known phenomenon, the innovation gap: good technical solution ... but no timely financial model to concur the market and at the same time secure renewable fuels for aviation as competing industries may offer higher return for a half product.

Societal Impact

Potentially, the societal impact for Europe and its cities – aside from the climate relevance – is huge and already materialising. Supporting and "fuelling" other initiatives to create a joined movement, building trust of investors to getting a new industry into Europe – with a potential first new facility in Rotterdam already looming, causes mayor investments (the initial investments at least 500 million per plant), employability and profit for organizations in the supply chain.

Two series of long-haul Bio Fuel passenger flights have been conducted over the period 2013-2014 in conjunction with ITAKA FP7 and other programs. The activities enlarge the visibility and demand for Bio Fuel, which in turn enlarges the demand for feedstock and their supply chains.

This project will lay the basis for multiple self-sustaining networks of regional renewable jet fuel supply chains based on sustainable (European) feedstock sources, that can account for 20% of renewable jet fuel demand in the European Union in 2025.
The project delivers the knowledge for an ecosystem for setting-up a regional jet fuel supply chain and prepares a probable supply chain to be financially supported by mayor investors. To ensure success, the approach is innovative. It incorporates:

- industry, academics and policy makers to understand economic, societal and ecological demands;
- a multi-disciplinary approach to understand "best option" choices in the network of value chain(s) to secure production of bio fuels in a very competitive environment, and;
- both supply side and demand side activities are pursued simultaneously to speed up the innovation process.

A Corporate Bio Fuel Program has been started in the Netherlands, which already has recruited 17 multi-national corporations and public bodies. Interest for the program is growing and there are plans to start an international Bio Fuel Program. Two series of long-haul Bio Fuel passenger flights have been conducted over the period 2013-2014 in conjunction with ITAKA FP7 and other programs. The activities enlarge the visibility and demand for Bio Fuel, which in turn enlarges the demand for feedstock and their supply chains.

eit Knowledge & Innovation Community
Climate-KIC

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Scandinavian Test Bed

Care_Traffic_Control

'How smart data mining can help prevent older people from unnecessary hospitalization, improve quality of life and save healthcare costs'

EIT Health will

- Remove barriers for disruptive innovations
- Invest in entrepreneurial and creative minds
- Exploit big data to tailor products and services
- Roll out widespread use of new technologies
- Foster self–contained management of health
- Keep older citizens active and socially connected
- Endorse sustainable health care systems

Growing old gracefully

A Societal Challenge

- People living longer requires a focus on health promotion rather than simply treating diseases of old age – *Nature 2004*
- Many hospital admissions of older people turn out to be neither necessary nor beneficial at great personal and societal costs – *Kings fund 2012*
- Effects of traditional unsolicited home visits in the general population are sobering – *BGS 2010*
- Urgent need for disruptive strategies for older people to arrange care at their own home involving the manifold stakeholders – *BUPA 2013*
- Citizens give highest trust – 69% – in the health sector to handle their data –*Symantec 2015*

Need of ground-breaking innovations

- Identifying opportunities for intervention when mining large scale health and registry data with machine learning;
- Addressing the enormous heterogeneity between older people using unobtrusive sensing;
- Implementing communications technology as a key medical engineering;
- Introducing pre-emptive home care as the new innovative standard of providing care;
- Providing tailor made integrated services.

'EIT Health offers a wealth of opportunities to benefit from the technological and business expertise as well as from a multi-faceted infrastructure of test environments in world leading organizations'

eit Health

The EIT is a body
Of the European Union

"EIT Health boosts disruptive innovation by jig-sawing enterprise, academia, public services and municipalities together"

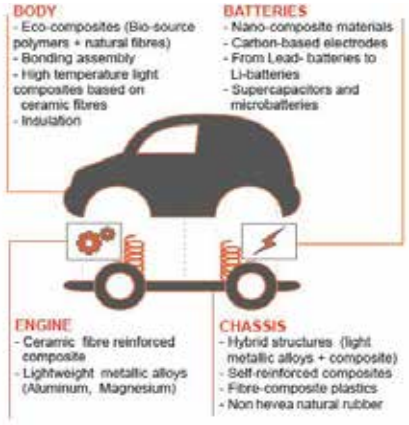
- **EIT applies machine learning of big data explored in the basic sciences**
  - *Academia mines registry data of 6.2 million Danes revealing unique health trajectories and opportunities for risk prediction and intervention*
- **EIT addresses checks and balances of handling health and registry data**
  - *'Digital Identity' talks and teaches on how to control you own data, how to make big data sustainable*
- **EIT shifts demand-driven care towards pre-emptive service strategies**
  - *8000 district nurses at 'Buurtzorg' provide innovative neighborhood care to overcome fragmented and ineffective traditional home services at lower costs*
  - *Targeted pharmacovigilance in Sweden reduces adverse drug effects by one third*
- **EIT provides cost-effectiveness analyses and scenarios for exploitation**
  - *'Gupta health care strategists' lay down how to reduce unnecessary hospitalization*
- **EIT involves early-adapters for outreach across Europe**
  - *'STACC' software technology and application center provides pathways to implement products and services in Estonia*

"Improved care for older people could free up to 7,000 hospital beds - 6% of the total capacity - saving the National Health Services nearly 700 m€ a year" *UK; Kings report 2012*

KØBENHAVNS UNIVERSITET · KAROLINSKA INSTITUTET ANNO 1810 · KTH VETENSKAP OCH KONST · Digital Identity · STACC · City of Copenhagen · BUURTZORG · Gupta Strategists

Raw materials solutions for a sustainable mobility

Smart Mobility Society



Lightweight and electric mobility is becoming the alternative technology of choice for passenger car and light delivery vehicles in the urban environment. To enhance resource efficiency during this transition requires solutions for a number of **raw materials challenges**. In particular, **end-of-life recyclability** needs to be improved whilst **maintaining/improving product performance.** EIT Raw Materials will thus work with OEMs and parts suppliers to introduce new raw material solutions for cars

Innovative technologies will be introduced by EIT Raw Materials and its partners to provide resource efficient solutions for urban mobility. Particular focus will be on novel materials for **body** and **chassis** (e.g. eco-composites, insulation, non natural rubber), **engine** (e.g. lightweight alloys, magnets) and **batteries** (e.g. Li-batteries, nano-composites). Materials considered will not only have to perform-in-use, but also be environmentally benign and fully recyclable.

Societal Impact

EIT Raw Materials 'Upscaling' and 'SME Growth Booster' projects will result in innovation of **processing technologies, market introduction of new materials and** the set-up of **companies providing new urban mobility** concepts. Together, these innovations will contribute greatly towards a **resource efficient urban ecosystem**. This will be backed up by dedicated training programs for designers on: **systemic design**, **manufacturability** and **recyclability of vehicles.**

EIT Raw Materials is supported by the EIT, a body of the European Union

Solabcool

Heat driven cooling

We use waste or ecologically produced heat to power highly efficient cooling systems

Co-operation with KIC InnoEnergy

KIC InnoEnergy's large knowledge network was instrumental in creating added value to the technology. KIC InnoEnergy's market network also played a role: at their Business Booster event in Barcelona, a leading European energy utility company showed interest in the SolabCool technology.

Key fact

Solabcool, the business venture launched from the Storage innovation project, uses waste or ecologically produced heat to power highly efficient cooling systems.

A ground-breaking innovation

This year the Solabcool plant will go into full production, selling two products: SolabCascade, a modular SolabCool system for small companies, and the SolabChiller, optimised for homes.

SolabCool

The best comfort with pure

Societal Impact

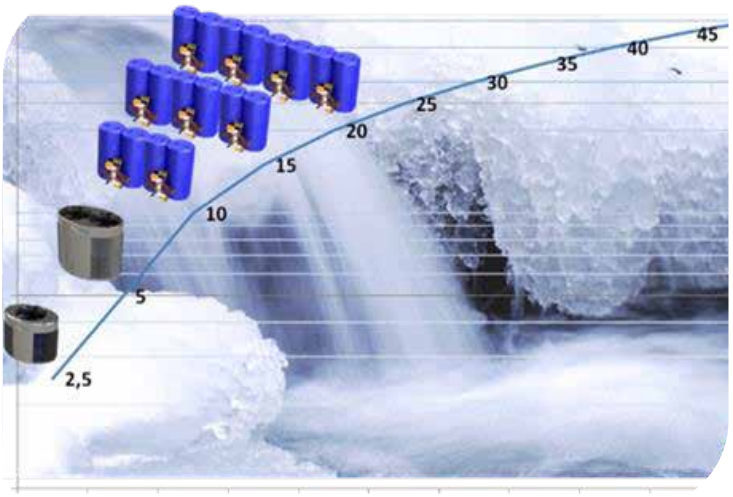
Effective use of district heating networks during summer; lower electrical peak loads in summer due to electrical air conditioners; and, increased comfort level at lower energy cost for consumers.

Key facts

- Start-up company, within first year 7 new employees
- Pilot factory opened
- Status: on-going cost-reduction, reaching commercialisation

Within its *Intelligent and energy efficient buildings and cities* programme, KIC InnoEnergy supported the further development of Solabcool and co-financed the critical system development phase from prototype until pilot production. In parallel to the product development, improved technology for the next generation could be developed.KIC InnoEnergy's ongoing support helps to attract external investors.

"With the Solabcool, excess waste heat is used to offer the end user higher comfort level"



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The EIT ICT Labs Master School

ICT Innovation for Top Talents

The EIT ICT Labs Master School is a European scale combined ICT and entrepreneurial education. It is a two-year program at advanced level leading to a double Master's Degree.

Co-operation within the KIC

The EIT ICT Labs Master School is an integrated cluster of KIC activities within EIT ICT Labs. The eight EIT ICT Labs innovation action lines provide valuable resources for the students as best illustrated in the summer schools and master theses work.

The main added values of the Master School are:

- To provide all students with a strong industrial connection
- To utilize EIT ICT Labs co-location center resources
- To facilitate interdisciplinary, inter-node teambuilding among students.

A ground-breaking innovation

The EIT ICT Labs Master School is breeding a new generation of ICT innovators. It constitutes a persistent and disruptive change of traditional ICT education on master´s level from being a base primarily for PhD education to being a stepping stone towards an entrepreneurial carrier. It combines a European dimension with an organizational mobility where students are exposed to local innovation ecosystems of the KIC nodes.

Societal Impact

The EIT ICT Labs Master School produces skilled ICT professionals on master level with enhanced capabilities in innovation and entrepreneurship. The success stories of the graduates of this education already shows a spread over and penetration into a variety of sectors in society.

Key Facts

The Master School comprise eight programs with different technical profiles combined with a standardized Innovation & Entrepreneurship minor.

20 universities host this education in 9 countries.

74 EIT-branded Master School students graduated from the first cohort.

Currently there are 400 enrolled students.

The innovation was created through a systematic design process during the first two years of the KIC´s existence building upon the competence of the 20 partner university and numerous partner companies.

The EIT ICT Labs node Co-location Centres are also valuable assets for the students. The EIT ICT Labs Master School was announced in 2011. The first cohort was admitted in 2012. The fourth cohort is admitted in 2015. The goal is to reach a level of 500 new students in two years.

It exhibits a linear growth and satisfactory performance results. The objective is to have a balance between EU and non-EU students and between genders. So far 40% EU students and 30% women have been reached.

In partnership with

EIT ICT Labs
MASTER SCHOOL

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Social media: facebook.com/EITICTLabsMSO

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WE4CC-II

Utilizing waste and renewable heat for clean water production and indoor air control.

The aim is to connect stakeholders in low grade heat production (waste, solar) with water – air networks. Reuse of low grade heat or renewable heat for high quality water production and air conditioning can substantially reduce energy consumption and CO2 emissions. Using unexploited waste heat from cooling water can reduce electricity consumption by up to 50% relative to water production using fossil fuels.

WE4CCII is a Climate-KIC innovation project led by TNO in cooperation with Laborelec (GDF Suez), Naked Energy Ltd. and TU-Berlin. It aims at the technical demonstration, business case evaluation and implementation of new value chains for production of high quality water and indoor air (humidity) control using low grade thermal waste energy from cooling water - with new technologies such as membrane distillation and water recovery from desiccant solutions.

A ground-breaking innovation

The WE4CC-II project has been testing the combination of technologies for using excess heat produced by industrial processes (e.g. electricity production) or specialized solar technologies such as Virtu® technology developed by Naked Energy Ltd. - that won the Venture Competition in October 2011 - in order to purify or desalinate water with the Memstill® technology developed by TNO. The cascading heat from these processes is intended to be used for heating & cooling, by using the Absorberbox® technology developed by TU Berlin.

The combination of Virtu® and Memstill® technologies has been evaluated in the lab, while a demonstrator of the Absorberbox® is running in the Berlin Botanic Gardens. A demonstrator of the Memstill® technology is now successfully evaluated at the Electrabel/Laborelec power plant in Belgium, capturing waste heat from the electricity production process and purifying surface water from a river near the site, in order to make high pressure boiler feed water.

What is the innovation?

In the WE4CC-II project an advanced membrane distillation technology (Memstill®) is evaluated for the production of demineralised water and drinking water using low grade heat. Membrane distillation is a thermally driven separating process where water vapour passes through a hydrophobic membrane and high quality liquid water is retained. This process is triggered by the difference in water vapour concentration across the membrane. By using heat to drive the process (waste heat from power plants, renewable heat from solar PVT systems, etc.), electricity consumption for high quality water production is cut and no excess heat is wasted or discharged to the environment.

Two processes have been utilised to put membrane distillation into practice:

- Memstill®: partial use of waste heat
- Memstill® with additional heat envelop (MD-HEX): full use of waste heat

WE4CC-II uses these membrane distillation technologies with the aim to commercialise the potential for waste heat / renewable heat - water cascades.

For air de-humidification, a market for future users of liquid desiccants (heat recovery, supply air drying and precise humidity control in buildings, de-humidification of greenhouses, drying of industrial goods) has to be prepared by developing a number of pilot projects, showing the technology and its specific contribution for power saving. Furthermore, industrial waste heat suppliers will be needed for the regeneration part of the desiccants. Desiccant networks can be envisaged as a new way of energy storage and transport under use of today unexploited waste heat sources, especially as applications of air de-humidification and regeneration services will regularly not be found on the same place.

Societal Impact

Waste heat is produced by a lot of processes that use energy. The biggest contributors to waste heat are industrial processes, domestic processes and energy production that occur in the urban environment. Often, this waste heat is lost to the ambient environment, contributing to a rise in global temperature. Storage and reuse of this waste heat contribute to improving energy efficiency and reduction of CO2 emissions in the city.

In this framework, the project shows synergies with the following Climate-KIC projects: Energy Atlas – that maps and balances the energy sinks and sources of the city of Berlin, and CMA Pilot Metropolitan Utilities Dialogue (Berlin) – a multi-utility platform.

This project - including the following Climate-KIC partners Netherlands Organisation for Applied Scientific Research (TNO), TU-Berlin (Technical University), Laborelec/GDF Suez, Naked Energy - is part of the Sustainable City Systems Platform and is a follow-up of the Pathfinder WE4CC.

When will it be introduced?

In 2015, the project aims to run a demonstrator at the Hotel Dolmen in Malta, where renewable heat originating from solar PVT panels (Virtu®) will be used to desalinate sea water; the potential to use cascading heat from this process to heat and cool the building through the Absorberbox® will also be explored. This integrated solution once demonstrated will be introduced to the market, most probably in the course of 2016.

The product Memstill®/MD-HEX modules for waste heat utilisation and the related service on technical and economic feasibility evaluation of Memstill®/MD-HEX for new customers at commercial price is planned for the end of 2015.

The product Desiccant regeneration units for waste heat utilisation, and the related service on technical and economic feasibility evaluation of desiccant regeneration for new customers at commercial price is planned for the end of 2015.

A new spin-off from TU Berlin and TNO for waste heat – water – air networks based on result of the business plan is planned for 2016.

Publication:

Norbert Kuipers, Robin van Leerdam, Jolanda van Medevoort, Willy van Tongeren, Bart Verhasselt, Lieve Verelst, Marnix Vermeersch & Dominique Corbisier (2014): Techno-economic assessment of boiler feed water production by membrane distillation with reuse of thermal waste energy from cooling water, Desalination and Water Treatment, DOI: 10.1080/19443994.2014.946722, see: http://dx.doi.org/10.1080/19443994.2014.946722

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About the EIT Community

The European Institute of Innovation and Technology (EIT) is an independent EU body. With our Knowledge and Innovation Communities (KICs), we enhance Europe's ability to innovate by nurturing entrepreneurial talent and supporting new ideas.

Our mission is to:

- Contribute to the competiveness of Europe, its sustainable economic growth and job creation by promoting and strengthening synergies and cooperation among businesses, education institutions and research organisations;
- Create favourable environments for creative thoughts, to enable world-class innovation and entrepreneurship to thrive in Europe.

The EIT is an integral part of **Horizon 2020**, the EU's Framework Programme for Research and Innovation. Horizon 2020 is a key pillar of the **Innovation Union** – a **Europe 2020** flagship initiative that aims to enhance Europe's global competitiveness.

Innovation through integration

To boost Europe's innovation capacity, action is needed to overcome the fragmented European innovation landscape; and this is where the EIT comes in. We have a pioneering role in increasing European sustainable growth and competitiveness by reinforcing Europe's innovation capacity in a dynamic global context.

The EIT brings together the 'knowledge triangle' of business, education and research to form dynamic cross-border partnerships: KICs. The KICs:

- Develop innovative products and services;
- Start new companies;
- Train a new generation of entrepreneurs.

Working closely together in the KICs, leading companies, universities and research centres, create more effective and innovative solutions for Europe.

The EIT's first three KICs were launched in 2010:

- Climate-KIC: addressing climate change challenges;
- EIT ICT Labs: generating world-class ICT;
- KIC InnoEnergy: tackling sustainable energy.

Two new KICs were designated in December 2014 and they will be setting up their activities across Europe in 2015:

- EIT Health: improving quality of life for European citizens and sustainability of health and social care systems.
- EIT Raw Materials: ensuring the accessibility, availability and sustainable use of raw materials for the economy and citizens.

We are growing!

By 2020, we will set up three more new KICs:

- EIT Food: ensuring a climate-resilient and sustainable global food value chain (2016);
- EIT Manufacturing: strengthening and increasing the competitiveness of Europe's manufacturing industry (2016);
- EIT Urban Mobility: providing sustainable solutions for urban mobility (2018).

Get in touch!

Climate-KIC:	EIT Health:	EIT ICT Labs:	EIT Raw Materials:	KIC InnoEnergy:
www.climate-kic.org	www.eit-health.eu	www.eitictlabs.eu	www.eitrawmaterials.eu	www.kic-innoenergy.com
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