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Welcome!

Dear Readers,

We have a clear objective: Triangulum is going to demonstrate, disseminate and replicate innovation, urban solutions and a detailed framework in order to co-create our future ´smart´ cities. The significant commitment and effort of all partners and stakeholders stands behind the current progress of our lighthouse projects in Stavanger, Eindhoven and Manchester. First visible results have already made their appearance with examples such as the initiation of new urban governance processes in some cities, or the Nordic Edge Expo in Stavanger, Norway.

The Triangulum project started highly motivated with a kick off meeting in Manchester in February 2015. On the following six weeks, Lighthouse Cities started detailing the implementation process of smart city solutions within their lighthouse districts. A lot has been achieved ever since and we are happy to keep you updated with the progress in every newsletter.

In strong collaboration with city partners, academic institutions from the lighthouse cities and Fraunhofer have started working together on the monitoring and replication framework. During the first on-site assessment in the lighthouse city Eindhoven (held in October) a huge amount of interviews were conducted. Local experts from the smart solutions implementation layer and from political and administration bodies helped enhancing the knowledge about Triangulum activities. This same process will be replicated in the respective Stavanger (30.11- 11.12.2015) and Manchester (11.01-22.01.2016) on-site assessments.

Follower cities Sabadell, Prague and Leipzig are also joining the onsite assessments, and profiting from the existing and emerging experiences during the implementation processes. They are the first municipalities following the evolution of the Triangulum Lighthouse Cities, and therefore will test the replication potential. The on-site assessment, to develop smart implementation plans in the follower cities took place in June 2015 in Prague, and will take place in Sabadell and Leipzig in February 2016.

Key to the success of the SSC1 projects is team work. Thus we would also like to thank all partners for the valuable contribution and are looking forward to linking these solutions to the work of our colleagues from the other lighthouse projects in 2016.

Happy Christmas and a successful year 2016!

Damian Wagner

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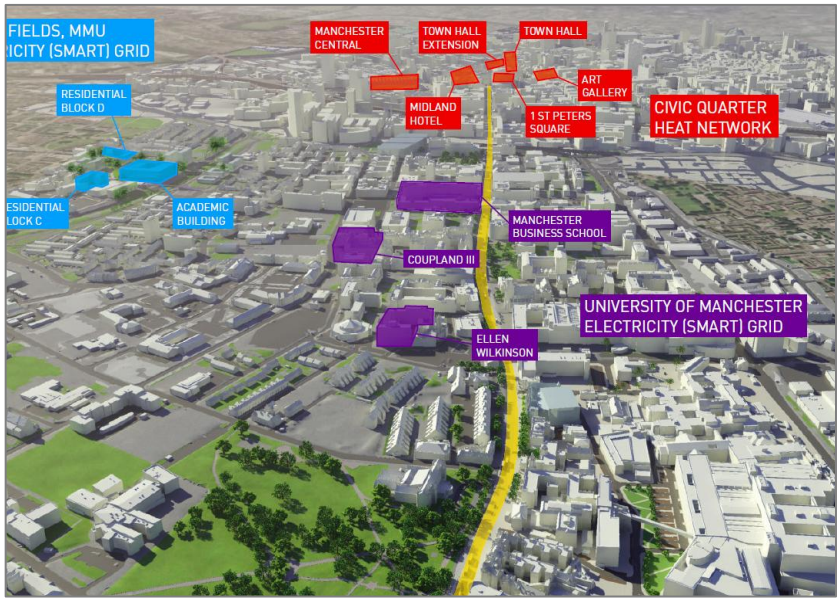
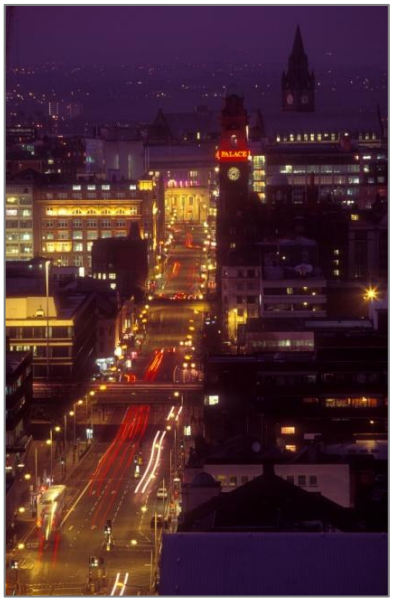
Triangulum - Our Cities

Lighthouse City Manchester

In our Lighthouse City Manchester the focus is on the transformation of 'the Oxford Road Corridor' into a 'smart City District' through 4 different approaches:

1. Establishing an open data and service engine including a 3D visualisation platform to improve energy and mobility efficiency and to establish an open application marketplace.
2. Connecting existing generation and storage assets to an optimised centrally controlled energy management system.
3. Connecting and supplementing existing energy assets with additional low or zero carbon assets to increase generating capacity whilst reducing carbon footprint.
4. Developing sustainable urban mobility schemes such as electric cargo bikes.





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Triangulum - Our Cities

Lighthouse City Eindhoven

In our Lighthouse City Eindhoven the focus is on the two districts Strijp-S, a former industry site to high-innovation mixed-use district and Eckart-Vaartbroek, a residential district. In Strijp-S the project aims to install a smart street light system, a Smart Mobility Management to control EV and fuel cell vehicles charging points and ICT, naming the implementation of a data platform. In the residential district Eckart-Vaartbroek the concentration lays on the retrofitting of 25,000m², as well as on the PV contribution, the use of wind power, smart meters and renewable biomass energy system for a heat network.

Lighthouse City Stavanger

In the Lighthouse City Stavanger the goal is to reduce CO_2 emissions through integrated e-mobility solutions. I.e. demo-project on three e-busses. Furthermore, the installation of a CHP (combined heat and power) for three large buildings (including a public indoor swimming pool) is planned as well as to implement smart generic gateways in 100 homes and two large public buildings. An advanced fiber optic infrastructure for new public services (e.g. video solutions) will be developed as well as a Cloud solution for gathering and analyzing big data from the project. The focus will be on civic engagement and citizen involvement.

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Triangulum - Our Cities

Follower City Prague

The City of Prague and the Prague Institute of Planning and Development (IPR) contribute by active cooperation within follower cities, share best practices and make every effort to replicate Lighthouse City solutions in the Prague's conditions. The IPR will also cooperate on developing the implementation plan with the Czech Technical University in Prague (CTU), a selected partner in the project. CTU conducts basic and applied research and numerous scientific projects with great emphasis on industrial use and applications and cooperates closely with both domestic and foreign-based institutions. CTU is also in disposition of scientific expertise of different solutions together with the independent assessment of their applicability and efficiency to establish the chain to research needs.

Observer City Tianjin

The Chinese city of Tianjin is participating in the Triangulum Project as 'Observer City' given the emerging importance of China both in terms of politics and market opportunities.

Tianjin's participation, as well as providing critical policy development work, presents significant opportunities for the industrial and private sector partners involved in Triangulum to access the Chinese smart city market. The University of Stavanger has already developed a cooperation agreement with the University of Tianjin. Tianjin will take part in the project in terms of learning and best practice.

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Triangulum - Our Cities

Follower City Sabadell

The proposed area for TRIANGULUM is the Northern area, currently inhabited by approximately 95.000 citizens. This area includes different urban structures, such as an older and consolidated area in the East; as well as an area in the North, which experienced a high population growth during the 70s, and another new city development, which has grown to reach former residential surrounded areas.

Sabadell expects to develop a concrete smart city implementation plan on integrated smart city solutions for energy, transport and ICT that identifies integrated actions that generate the highest impacts on energy efficiency, emissions reductions, resources optimization, economic development and citizenship involvement. The current Sabadell smart city program has designed six strategic areas of interest and it is working on 34 initiatives so far in pursuit of this alignment and integration: Real time information. Decrease in public expenditure in Municipal services. Improve efficiency and quality of public services. Sabadell as a model for smart management. Boosting the knowledge economy. Sustainability: The smart city model implies innovative management measures to reduce demand of fossil fuels and decreasing CO2 emissions.

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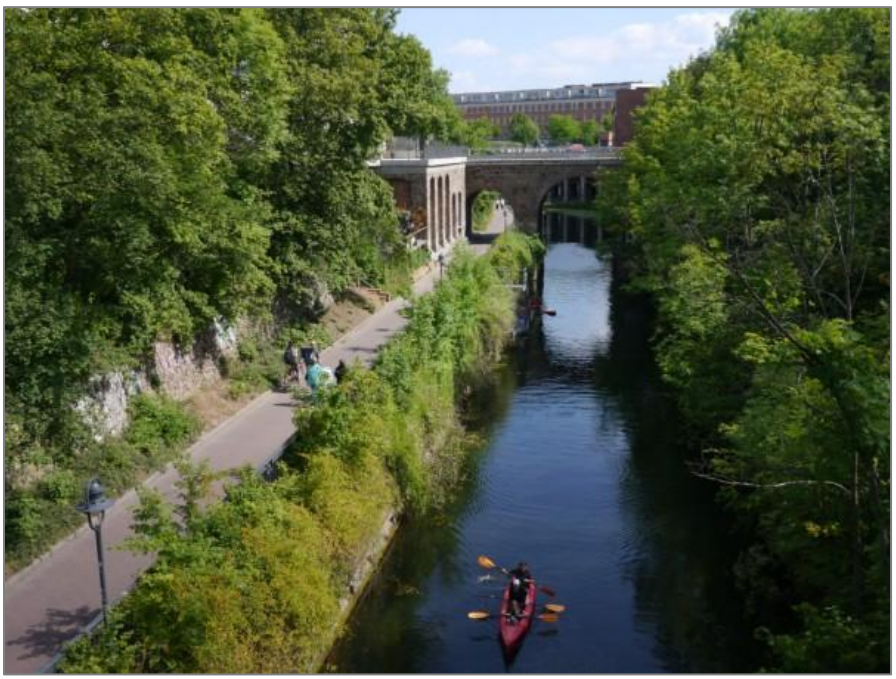
Triangulum - Our Cities

Follower City Leipzig

Leipzig as Follower City will actively participate in the consortium of Triangulum in order to benefit from the experiences existing and emerging during the implementation processes in the Lighthouse Cities. The transfer of know-hows between the Follower Cities will provide additional support to the local processes. Our main focus is to gain a real integrated approach (powered by the development of a Smart City Implementation Plan) a stronger recognition of implementation of renewable energy resources as well as rethinking multimodal traffic/logistic/ICT system solutions.

A second important point is the attraction of SMEs to be involved in future investments for the development of a smart city district. SMEs as investors, users and developers in the Smart City District with the help and knowledge transfer from the Lighthouse Cities could boost the development process in the district. Innovative ideas and solutions can be presented to other SMEs or investors to encourage further investments in other parts of the city.



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Progress in our Lighthouse Cities

City Manchester

In Manchester the main focus of activity in all the workstreams has been the development of the 1st technical implementation report due in January 2016. As part of the energy task, Siemens are continuing work on the energy technical implementation report. They have now issued asset survey reports to all stakeholders for review and sign off. They have also presented their high level strategy to stakeholders that details the energy workstream modules, learning objectives and learning outcomes of the project. As part of the mobility task, a stakeholder workshop took place on 11th September and from this the 3 priorities for the mobility workstream have been identified. A draft of the mobility technical implementation report has been issued and will be circulated by the end of October and this will form part of the overall technical implementation report. As part of the ICT task, cross workstream engagement between the University of Manchester and other stakeholders has taken place to continue the development of the OSIsoft platform that will be used to collect data from a range of sources across Manchester. Clicks and Links have started the development of the specification for the visualisation platform. As part of the Dissemination and Communication activity, representatives from Siemens, Manchester City Council and Clicks and Links will be attending Smart Cities event in London on 8th October, chaired by Mark Prisk MP. This event will explore the challenges and opportunities faced by Manchester's Triangulum project in particular the unique challenges around governance and leadership, and ownership of assets and data.

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Progress in our Lighthouse Cities

City Eindhoven

First lift-off in Lighthouse City Eindhoven

In Eindhoven the Triangulum partners have been working hard to get one of the first projects in Eindhoven to an actual lift-off! In Eckart Vaartbroek, one of the two lighthouse areas in Eindhoven, we are almost ready to start the interactive process with the citizens of Eckart Vaartbroek. The partners, KPN, Woonbedrijf and the municipality of Eindhoven, do this in close co-operation. One of the main goals of Triangulum after all is to work in so-called co-creation; together with all possible stakeholders define what problems have to be solved and work together in finding the best innovative solution. The interactive process is the basis for the renovation of the first 200 family homes.

Interactive process with the citizens of Eckart Vaartbroek

Before we start with the renovation of the family homes, one of the most important tasks in the project has to do with citizen participation and co-creation. Together the partners made an analysis of all the relevant players, which are in one way or another related to the renovation: the residents who live in these houses, people who live in the same neighbourhood, other tenants, owners, resident-associations, social designers, preferred suppliers and many other stakeholders. As start of the citizen participation, we want to know how the people live in there homes, how they want to live there in the future and how they think about sustainability and what they can contribute. Whilst sustainability is an important issue and expenses for energy consumption will probably rise, the aim of this project is not only to encourage sustainability projects, but also to stimulate the engagement and participation of residents. How are we going to so that? On the digital platform 'WoonConnect' their will be an online survey available where every household can give their opinion on different topics, from pros and cons of the neighbourhood and their house to voluntary work possibilities and they can see what their influence is on their own energy bill. Besides the survey every household can see there own house in a digital 3D model on the platform 'WoonConnect'. For the first 200 households of the houses that will be renovated, we will gather this information in an personal interview at their kitchen table. In the beginning of next year we expect to have the results of the interviews and survey.

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Progress in our Lighthouse Cities

City Stavanger

Status Oct. 2015: Lighthouse City Stavanger is focusing on smart infrastructure on integrating energy, mobility and ICT. The partnership is on track in progress on deliveries. The cloud solution for gathering and analyzing big data from the project, is progressing closely connected to impact and monitoring solutions, ensuring the integration. The implementation and installation of smart generic gateways in 100 homes and 2 large public buildings are about to start. All homes are now recruited and arrangements are made to ensure privacy and close citizen involvement. Our advanced fiber optic infrastructure will be used for new public services, demonstrated through new smart solutions. The city assessment taking place first half of December, will give us a good guidance on further achievements, both on citizens involvement and progress development. The central heating plant (CHP) serving three large municipal office buildings including the public swimming pool, will also demonstrate reduction of GHG emissions as well as integrated use of renewables. Through integrated e-mobility solutions we will demonstrate CO2-emissions to be heavily reduced – as in our e-bus project. Both the CHP and e-busses are part of an ongoing innovative procurement and tendering process. Mobility and its demand for charging infrastructure relevant for all electrical vehicles, is being addressed on a broader city level, regarding societal needs and demands and at the same time securing the capacity of energy flow.

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Progress in our Follower Cities

City Leipzig

After official project launch Leipzig started to set-up and establish the necessary project- and management structures for implementation. As 3rd party support we have the University of Leipzig represented by the "Kompetenzzentrum Öffentliche Wirtschaft, Infrastruktur und Daseinsvorsorge e.V.".In preparation for the "Smart City Implementation Plan" research work on existing and relevant strategic plans and ongoing projects has been started. Parallel important representatives of science, politics, city administration and local enterprises have been identified and informed to support the development of the implementation plan.

Goal 1: Aggregation of existing strategic plans, concepts. Identify relevant innovation fields and synergies or interfaces.

Goal2: Definition of local pilot projects for development of smart-city districts through involvement of relevant stakeholders.

Goal 3: Specify relevant costs per pilot project as well as show out relevant stakeholder networks and their scope of action and responsibilities

Two different working formats have been set up. Firstly we developed the so called "Forum of the Future" and secondly the "Future Labs". The "Forum of the Future" has the function of an advisory council and decision maker. Main goal is the development of visionary thematic fields regarding the smart city context as well as the knowledge transfer between the different working levels. The advisory council consists of around 20 persons (i.e. the Mayors for Urban Development and Construction, Economic Development and Environment; Enterprise CEOs and representatives of the City Council). The meetings of the advisory council will take place every 3-4 months. The first one took place on Sept. 21st 2015 at "Alte Handelsbörse Leipzig". Next meeting is planned for Dec. 17th 2015. On working level Leipzig started the so called "Future Labs" with experts on different thematic fields. The workshop groups are divided in the following six thematic fields: Energy; Housing; Water/Sewage/Waste; Enterprises/Economy/Broadband; Mobility and Governance. Each group consists of around 10-12 experts. The first "Future Lab" session was held on Oct. 6th 2015 at University of Leipzig. Main goal for the workshop rounds was to develop a common understanding/definition for the term "Smart" and the related potential local innovation fields. Main focus in the next Labs will be the verification for the potential of realization in the future Smart City District Leipzig West in comparison to the existing concepts and strategic plans. Furthermore we need to identify the synergies/interfaces between the different workshop groups and in addition to that a priority list of measures/projects has to be developed. Four meetings of the "Future Labs" are actually scheduled. Next meeting is planned for Feb. 2nd in 2016.

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Progress in our Follower Cities

City Sabadell

The municipality of Sabadell in partnership with its linked third parties related to building refurbishment (VIMUSA), economic development (PES) and ICT (IAS) is fully engaged in the development of the implementation plan as follower city under the framework of the Triangulum project. Sabadell is also following closely the development of the smart city framework that will facilitate the replication from lighthouse cities to follower cities and beyond. As a result, a local working team has been established, with the participation of the Mobility, energy and sustainability areas, which together with VIMUSA, PES and IAS have been collecting local data related to city indicators and action fields, as established in the aforementioned smart city framework. Moreover, a preliminary baseline analysis of residential buildings of the Triangulum site in Sabadell has been performed, which will make it easier to identify improvement measures during the project development. The municipality is also already preparing the on-site assessment which will take place early 2016, and will be present in on-site assessments for lighthouse cities taking place in the coming weeks. The city is also analysing in detail the future ERDF funds to match the funding opportunities with the Triangulum actions foreseen for Sabadell: public NZEB, ICT architecture, open data platform, smart grid integration, jobs creation and training, and in general replication of other actions implemented in lighthouse cities. The Triangulum project will also become a part of the integrated city strategy on sustainable urban development (EIDUS) to be approved for the period 2015-2020. Finally, the city of Sabadell has promoted the presence of the Triangulum in two fora, the Sabadell Smart Congress, held last 25 and 26 February, and the Smart City Expo & World Congress, to be held in November 2015, where a proposal for presentation with contribution of Sabadell was submitted and accepted.

http://sabadell.cat/ca/noticies-municipals/37846-la-comissio-europea-financara-el-projecte-dinnovacio-en-ciutats-intelligents-anomenat-triangulum-amb-participacio-de-lajuntament-de-sabadell

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Activities

Triangulum project presentation Norway, 17-18 September 2015

The Triangulum project was presented at the Nordic Edge Expo in Stavanger, Norway. The yearly expo, which gathers creators of smarter cities and smarter homes, aims at becoming Northern Europe's most important arena for knowledge exchange and inspiration. Smart cities, change-making companies, forward-thinking universities and dynamic organizations are attending the event.

Triangulum's representatives Alanus von Radecki (Fraunhofer, Germany), Steve Turner (Manchester City Council, UK), Henk Kok (City of Eindhoven, Netherlands) and Tone Grindland (City of Stavanger, Norway) are part of the world-class collection of speakers taking part on the Nordic Edge Expo.

Visit of a Stavanger home with smart solutions

Lyse, our local business partner, showed and explained us their smart home solution. Another safari around the city showed several of the smart solutions the municipality already has in place in the city of Stavanger.

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On-site Assessment

At the core of the impact assessment and replication of smart solutions is a joint data assessment in collaboration with the cities and local stakeholders focussing on the following levels:

1. The Solution Level

We assess the smart Triangulum solutions in a modular way. This helps us understand how local actors deliver successful innovations under real life conditions. We want lo learn, how costs and benefits of local stakeholders link to technologies and smart services, in order to design investment schemes for a future replication of solutions.

2. The City and District Level

We need to understand the role of the local context in successfully delivering smart solutions. Assessing information about each city and district helps us understand important drivers and barriers for smart districts.

Both levels will be assessed during a two week citylab visit to each city, entailing expert interviews and workshops with local stakeholders to ensure that all relevant facts and ideas can be considered.

City	Date
Eindhoven	12.10. – 23.10.2015
Stavanger	30.11. – 11.12.2015
Manchester	11.01. – 22.01.2016

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Onsite Assessment

The first on-site assessment in Eindhoven

The result and validity of the smart city replication framework will depend on close collaboration, support and the expertise of local stakeholders.

We have prepared joint templates for data assessment which we completed during a two week Citylab visit in Eindhoven from October 12 – 21 2015. During this on-site assessment, led by the Fraunhofer-Society, expert interviews have been conducted to enhance our knowledge about Triangulum activities in Eindhoven. Most importantly, we have been looking for information on the technologies used, the actors involved and the cost and benefits related to the implemented smart city solutions. Based on this, our researchers have come up with hypothesis about the greater impacts and benefits associated to those actions, which we then have discussed with local stakeholders in a workshop in the second half of the Citylab.

The knowledge gathered through this approach will ensure a thorough understanding of the implemented smart city measures, their impacts, applicability and replicability. Cities will be able to track if their smart city goals have been achieved and businesses will be provided with in-depth insights on how their smart city products perform in real-life settings. Moreover, Fraunhofer will come up with business and investment strategies to make the Triangulum solutions replicable under market conditions. Triangulum partners who have received a budget for contributing to these new business plans by 2017 might also benefit and build their deliverables upon our findings. All in all, the smart city replication framework will open new smart city business opportunities, ensure a profound basis for future planning and facilitate further sustainable development in the smart city sector.

The outcomes and solutions of all three on-site assessments will be published in our next Newsletter.

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Past Events

Collaborative Cities: Design and delivery in Manchester

This discussion and networking event have taken place on Thursday 8th October in Siemens' R&D Centre. Mark Prisk MP has chaired this session and has been joined by the following speakers:

- Steve Turner, Head of future Cities, Manchester City Council
- Vin Sumner, Founder and CEO, Clicks and Links
- Paul Brodrick, Head of connected Communities, Siemens
- Mark Watts, Executive Director, C40

The challenges around the creation of smart city districts are not technology based.

Their establishment and the solutions and technologies within them rely increasingly on collaborative working between public authorities, private sector industrial partners and academic institutions.

This creates some unique challenges around governance and leadership as well as ownership of assets and data.

Smart city districts need to be able to demonstrate 'place' based benefits as much as 'organisational' ones. How we replicate smart city districts on a commercial basis and at scale also creates its own set of issues within a challenging public sector finance arena.

This event explored the challenges and opportunities faced by Manchester's Triangulum project, which focuses on the integration of energy, mobility and ICT systems around infrastructure assets within 'Corridor Manchester', and is a collaborative project involving five strategic partners: Manchester City Council, University of Manchester, Manchester Metropolitan University, Siemens, and Clicks and Links.

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Past Events

The Nordic Edge Expo 2015

By establishing the Nordic Edge as an annual smarter cities and smarter homes expo, the Stavanger region aims to be at the forefront of the development of efficient and environmental friendly innovative solutions for urban communities in the Nordic countries. By bringing together the best thinkers and the best doers, Nordic Edge will be a not-to-be-missed arena for ideas exchange, inspiration, insights and action.

The next Nordic Edge Expo will take place on 6th-7th October 2016. Find more information here.

Role of Triangulum:

Triangulum's coordinator Damian Wagner (Fraunhofe, Germany) as well as the representatives Alanus von Radecki (Fraunhofer, Germany), Steve Turner (Manchester City Council, UK), Henk Kok (City of Eindhoven, Netherlands) and Tone Grindland (City of Stavanger, Norway) were part of the world-class collection of speakers.

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Past Events

SmartCity World Expo

The world leading smart city event, bringing together global, national, and regional urban representatives, thought leaders, academic institutions, research centers, incubators, investors, and top corporations that have the kind of decision-making power that drives smart cities and empower its citizens.

Urban Futures Conference

Fraunhofer's "Urban Futures" Conference aims to bring together relevant stakeholders from Germany and abroad specialising in sustainable urban development and the smart cities. Visionaries from municipalities, politics, business and research will be presenting and discussing their solutions for the cities of the future.

More than 400 experts are expected to attend. Program formats such as the "Call for ideas" innovation competition, "Morgenstadt marketplace", "Speed dating" for mayors and the „Ideas lounge" offer additional opportunities to gather information and exchange ideas.

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Past Events

Women4Energy International Conference 2015

This year's Women4Energy International Conference takes place in Haus der Wirtschaft, Stuttgart, Germany on 2nd December 2015.

The focus of this year's conference will be on Smart Cities and the trends for the future, energy efficiency and renewable energy.

The conference reaches out to all professionals active in energy related innovation to:

Create new business ideas and technology solutions for the energy market

Generate and discuss new business models to get solutions to market

Encourage innovative business creation, and to

Enhance market entry for innovative energy technologies, processes and services.

Please find more information on the website:: https://www.steinbeis-europa.de/event.W4E-2015.html

Programme Highlights:

- Challenges and solution approaches of the questions of energy efficiency in a Smart City
- Presentation of future trends in Smart Cities with the focus on renewable energy, sustainable living environment, better energy efficiency and new innovative ICT solutions with examples from lighthouse cities in Europe

Apply for the Call for Papers and present your paper in one of the 3 afternoon sessions focused on

1. Energy efficient Smart Cities - ICT, mobility, energy
2. Smart Cities - Resources - Solar, wind, water, biomass
3. Efficient buildings - Heating, cooling, building insulation, smart home

During the day there will be opportunities for networking and exchange.

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Partners

Project Management

Fraunhofer IAO · Universität Stuttgart · STEINBEIS-EUROPA-ZENTRUM

Eindhoven

EINDHOVEN · TU/e Technische Universiteit Eindhoven University of Technology · kpn · WOONBEDRIJF · VolkerWessels

Manchester

MANCHESTER CITY COUNCIL · MANCHESTER 1824 The University of Manchester · Manchester Metropolitan University · SIEMENS · Clicks+Links

Stavanger

STAVANGER KOMMUNE · GREATER STAVANGER · Universitetet i Stavanger · ROGALAND FYLKESKOMMUNE · Lyse

Replication

Fraunhofer FOKUS · IPR PRAHA · Ajuntament de Sabadell · Stadt Leipzig · TÜV SÜD

Follow us on Twitter: @Triangulum_EU

Contact:
Project coordinator: Damian Wagner, Fraunhofer IAO , damian.wagner@iao.fraunhofer.de
Press contact: Saskia Heyde, Steinbeis-Europa-Zentrum, heyde@steinbeis-europa.de

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