Europe's Urban Mobility and Energy Transition: Lessons learned from the European Sustainable Energy Week

By J. Chenadec, Green IT Amsterdam & H. Niesing, Resourcefully

On June 5th, the INTERREG project EV ENERGY participated in an Energy Day session, organised during the EUSEW, the biggest EU event for a clean energy and mobility transition.

Enabling urban transition challenge

European cities are investing massively into electric mobility, especially electric vehicles, but also buses, freight, water transport, bikes, mopeds, etc. This is an important way to create a healthier city. Renewable energy in the city is also growing, mostly solar as this is the most viable clean source of energy in densely populated areas.

The session highlighted the need to combine electric mobility and renewables, facilitated by ICTs, such as smart grids to name one. The focus was made on participating projects that are all involved in various initiatives at European level, demonstrating how these two sectors can enforce instead of blocking each other.

EV and solar technologies are reaching market matureness. However, we see governments struggling with the development of charging infrastructure, its organisation and financing. The largest challenge observed is how to arrange integration at a larger scale in and around the city. Growth in solar renewable energy in the city creates an energy production peak between 10 and 16 hours, the overall energy demand peaks of a city are between 7-9 in the morning and 17-20 in the afternoon/evening.

We already observe the impact of these mismatches in different cities, impeding to electrify their bus fleet or limiting the EV charging area or intensity. Also, the electricity grid faces problems in not so well-connected areas. On top of this, we observe a rapid growth in electricity substituting gas or other fossil fuels in (North West) Europe. These problems will aggravate rapidly if we do not act now and invest in our future, especially zero-emission mobility, clean energy, smart storage (in EVs and 2nd life batteries) and flexible energy usage. Europe cannot afford to extend the electricity grids (expensive infrastructure) to satisfy the energy demand at peak moments. These peaks require extra energy for a few hours a day during a couple of months a year.

The main questions to answer during the conference were:

- How the projects' cycles can be interlinked for large-scale integration and demonstration, hence long-term results?
- How demonstration projects can influence policy-making on a local and regional level?
- Why long-term investments are of most importance when planning and monitoring projects?

European's projects activities at different policy moments

At European level, the European Commission launched in 2015 a comprehensive work programme, the Energy Union. This cross-cutting policy initiative acts on different levels such as energy, climate, transport, foreign, social, economic policies, etc. The latest package of initiatives under the Energy Union was adopted on 30 November 2017. It represents the biggest energy policy package ever to decarbonise our economy in line with the Paris agreement; take a leading role on the way to more intelligent, more efficient and cleaner energy for all as well as to strengthen consumers.

One of the main conclusions was that the digitalisation of the future energy system will increase the digital capacity of the energy sector for the benefit of a system that is able to integrate higher shares of renewables and promotes energy efficiency, meaning to greatly enhance demand flexibility, the integration of variable renewables, smart changing for electric vehicles and distributed generation.

To that end, how can innovation and digitalisation be linked to bring benefits and boost the economy?

Four European projects highlighted the need for large-scale demonstration to get backup by policy-regulations improved and allow the market to contribute.

The Interreg North Sea Region project SEEV4-City, presented by Adrian Vinsome from CENEX UK, is focusing on promoting green transport and mobility by optimising the intersection between mobility and energy and help create a business case. They are developing 6 **technological pilots** in The Netherlands, Germany, Belgium, Norway and the UK, each of them on different scales of operation and very different timelines. The systems demonstrated are very new – prototypes and early market offerings –, operate with different infrastructure and political/policy frameworks and converging towards emerging standards.

CleanMobilEnergy – a Interreg North West Europe project – aims to significantly reduce greenhouse gases emissions in cities by combining renewable energy sources, energy storage and the charging of electric vehicles using an **innovative energy management system**. Here the focus is to connect an iEMS with either vehicles (charging, smart charging, V2G), renewable generation or storage under four city pilots.

Harmonising and incorporating sustainable mobility plans and renewable energy action programmes is the overarching objective of the SIMPLA project and project manager Luca Mercatelli from Area Science Park. **Planning** can be part of the solution to develop a widely available, innovative capacity building methodology delivering concrete results and working extensively with public authorities & fostering the involvement of stakeholders as well as supporting further exploitation and replication of the actions.

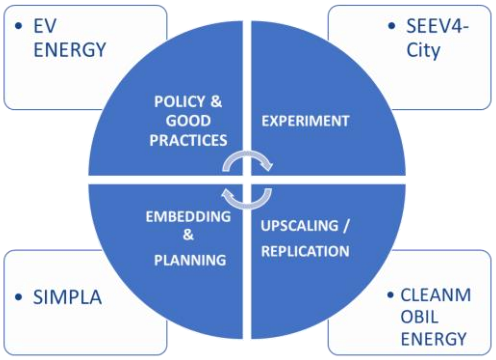

Photo 1 - The policy projects cycle

Finding and assessing adequate **new policies development and good practices** – that are still too fragmented in Europe – is what the Interreg EV ENERGY project is working on for three and a half year, leading to a better uptake, upscaling, planning and replicability for enabling large-scale business practices in cities. Julie Chenadec from Green IT Amsterdam talked about how interregional learning, exchange, transfer and monitoring of good practices and policies between 5 cities can help addressing the intelligent integration of electric vehicles and renewables with ICT.

Next steps for large-scale implementation and long-term investment

To reach a more visible impact at a city scale, more demonstration projects at technical, financial and social level are needed. The governments need to see and understand that large investments in a smart mobility-energy system are profitable for "Planet People Profit" and that this needs legal, regulative and financial backup. Scaling-up experiments in Europe need financial support to provide long-term solutions. This is a real market changer.

Shelley Forrester was invited to talked about the European Investment Advisory Hub. It is Europe's gateway to support investment and create an investment-friendly environment through improvements of the European regulatory environment, supports investment in the real economy through the European Investment Advisory Hub and mobilise €500bn of additional financing through the European Fund for Strategic Investments (EFSI). 741 requests have been sent to the Hub, with the majority concerning the development of Energy related actions and the development of infrastructure, equipment and innovation for transport.

The mobility sector has taken up the challenge and requires limited support in this process, but the grid operators (DSO's), the relevant "build-environment actors" (housing companies, real estate agencies etc.) the integrators (in between mobility – energy – storage) do need this.

Melchior Kanyemesha, from the CTO office explained us how the City of Amsterdam wants to take a leading position in the energy transition of The Netherlands, providing a vision where technology pushes innovation and innovative companies and where the transition to (shared) e-mobility and emission free mobility grows swiftly. However, current issues are hampering innovation such as uncertainty in the direction and overall progress, small scale tailor-made solutions and fragmented activities and initiatives. That is why, we need to consider a top-down and intervention approach where collaboration between different stakeholders will build a foundation and enable to work together further. The result is a shared implementation-innovation loop for the city as a whole to improving the collective effectivity of the city's efforts: setting the agenda, innovating, embedding and implementation.

The Amsterdam Energy ArenA's director Henk van Raan told us the story how the ArenA, a long-term project, will soon be the largest clean energy storage system in the world. They became carbon neutral in operations in 2015. The ArenA is composed of a direct current connection between solar panels and a low energy field lighting is in the planning, large-scale smart electric vehicles charging and vehicle-to-grid (V2G) services. This future proof and innovative project relies on efficiency, sustainability and reliability to provide the specific space for innovation and future proof technologies.

Conclusions

All the speakers and attendees agreed that the mobility sector and the energy (electrical power distribution) sector have operated independently from each other for decades and now their intelligent integration into the energy and mobility system is crucial. As a matter of fact, electric vehicles represent a major disruptor to the industry but cannot be complete without integrating cities and their related urban challenge: they are the main energy consumers and offer the greatest opportunities for change. In order to be successful on this transition theme, with the different phases of development in mind, and the new challenges to be tackled, we need political and financial braveness from politicians, governments, the infra-operators and of course entrepreneurs supported by knowledge institutes. Collaboration is key!

We were kindly hosted by the Permanent Representation of The Netherlands to the EU. Thank you to all participants and speakers for this conference.

EV ENERGY is an INTERREG Europe- funded project under the thematic "Low Carbon Economy", addressing the intelligent integration of the energy and mobility system by enabling interregional policy and good practices learning, transferring the most appropriate policies and good practices to cities and regions and large-scale implementation.