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PUTTING THE ENERGY TRANSITION INTO PRACTICE: „EMILIPPE“ AS AN EXAMPLE FROM KREIS LIPPE

The article considers the putting the energy transition into practice: „EMILIPPE“ for example KREIS LIPPE.

The proposed strategy, which allows you to create value locally, decentralized structure of renewable energy results in local effects, and minimizes capital outflows from the region. Also proposed project which will be finally adopted in 2016, which resulted in the are expected an intensive growth of energy of of mobility in the region.

Keywords: energy, mobility, region

Фогельскамп Ш.

ВВЕДЕННЯ ЕНЕРГЕТИЧНОГО ПЕРЕХОДУ НА ПРАКТИЦІ „EMILIPPE“, НА ПРИКЛАДІ KREIS LIPPE

В статті розглядається введення енергетичного переходу на практиці: "EMILIPPE" на прикладі KREIS LIPPE.

Запропонована стратегія, яка дозволяє створювати цінності локально, децентралізовану структуру поновлюваної енергетики, що призводить до локальних ефектів, і зводить до мінімуму відтік капіталу з регіону. Також пропонується проект, який буде, нарешті, прийнятий в 2016 році, в результаті якого, очікується, інтенсивний ріст енергії мобільності в регіоні.

Ключові слова: енергетика, мобільність, регіон

Фогельскамп Ш.

ВВЕДЕНИЕ ЭНЕРГЕТИЧЕСКОГО ПЕРЕХОДА НА ПРАКТИКЕ "EMILIPPE", НА ПРИМЕРЕ KREIS LIPPE

В статье рассматривается введение энергетического перехода на практике: "EMILIPPE" на примере KREIS LIPPE.

Предложенная стратегия, которая позволяет создавать ценности локально, децентрализованную структуру возобновляемой энергетики, что приводит к локальным эффектам, и сводит к минимуму отток капитала из региона. Также предлагается проект, который будет, наконец, принят в 2016 году, в результате которого, ожидается, интенсивный рост энергии мобильности в регионе.

Ключевые слова: энергетика, мобильность, регион

About our district. Lippe is a district („Kreis“) in the east of North Rhine-Westphalia, Germany.

Neighboring districts are Herford, Minden-Lübbecke, Höxter, Paderborn, Gütersloh, and district-free Bielefeld, which forms the region Ostwestfalen-Lippe. Kreis Lippe is a district representative for rural regions in Europe. Lippe has approx. 346.000 inhabitants in an area of 1.246,21 km. As a typical rural region, Lippe has an improved connection to renewable energy aspects.

About our aim. Our main aim concerning the question how to put the energy transition into practice is:

- the transition of KREIS LIPPE to a new energy portfolio - dominated by renewable energy.

- to improve local energy efficiency and sustainable development.

- to reduce carbon dioxide emissions from urban road traffic.

At Lippe renewable energy encompasses wind, biomass and solar power as possible

resources for what is called in Germany „Energiewende“.

About our strategy. Our strategy includes a multiple approach because piecemeal measures often have only limited potential. Our strategy also entails a democratization of energy: public wind farms and solar parks can involve many citizens directly in energy production and the topics of „Energiewende“. From an economical point of view this attempt enables creation of value locally: The decentralized structure of renewable energies leads to local based value effects and minimizes capital outflows from a region. So our main task concerning energy perspectives in our role as a Department of Economic Development is to think about possible projects which support our local contribution of „Energiewende“.

One of the questions we deal with is how to organize a business traffic which is mainly sourced by renewable energy in Lippe?

About our project „EMiLippe“: To give an ambitious answer to that question the partly government-funded project „EMiLippe - Business E-Mobility in the Rural Region of Ostwestfalen-Lippe based on Renewable Energy“ was founded in 2013.

This lighthouse project should be pointed out in the following lines and has the goal of developing an E- mobility system for business logistics in a rural region with regards to a maximized usage of own-generated renewable energy.

Actors and partners of this project are companies and institutes in East Westphalia-Lippe (OWL), which own an E-Car fleet. This fleets of the particular entities shall be driven by renewable and own-generated energy.

The special requirements of this project emerge through the fact that the E-Car fleets are used mutually by employees at different locations. Caused of this fact, high geographical and temporal availability has to be guaranteed.

As a result EMiLippe will connect the business logistics of the involved companies in a global mobility management system (G-GMS).

So the goal of EMiLippe is to create an E-Mobility system for business trips between the region's companies, where it shall be possible to charge cars at different companies using a maximized amount of renewable energy.

The involved companies are the Herbert Kannegiesser GmbH from Vlotho (machine-building), itelligence AG from Bielefeld (IT), Phoenix Contact E- Mobility GmbH from Schieder (E-Mobility Solutions) and the Kreis Lippe (government).

As associated research institutes the Fraunhofer Application Center for Industrial Automation (IOSB-INA), the Institute Industrial IT (inIT) of the OWL University of Applied Sciences and the OWITA GmbH (Electronic R&D) in Lemgo are involved in the project. The project is partly governmental-funded by the german Bundesministerium für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB).

For to solve the task EMiLippe uses solar carports in combination with intelligent management of mobility and energy via IT to drive a rural region's business traffic by renewable energy. A short overview about how the usage-process works:

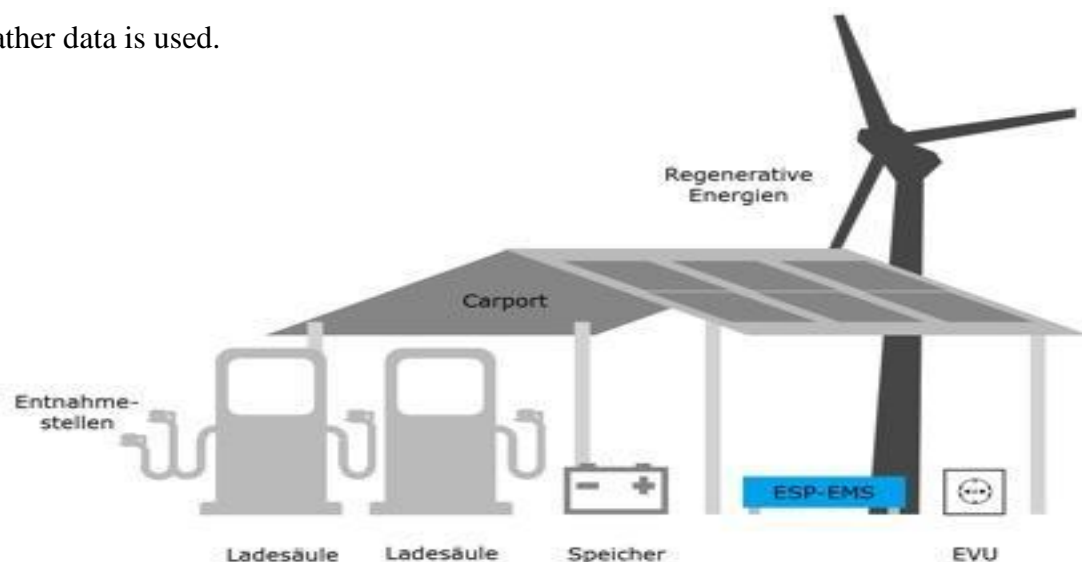
The company's employees are able to book an E-Car for their trip in the company's mobility management system (U-MMS) via web-browser or mobile app.

This U-MMS is based on existing software modules (SAP) for the booking and billing processes, as well as prediction and planning based on real-time data acquisition from all solar carports and E-Cars.

Therefore data from the carport components solar and battery inverter and smart meter can be acquired via Ethernet by the energy management system (EMS).

The EMS provides relevant data to the U-MMS. Additionally the U-MMS acquires data (position, speed, battery charge) from the car fleet via On- Board-Units (OBU) to predict arrival times and charging needs. Charging is planned according to the departure of a vehicle, as well as solar generation and battery status. To predict the solar and wind generation

weather data is used.



The carport components

A global mobility management system (G-MMS) provides intra-company functionalities, e.g. employees travelling from one company to another. Here, data has to be exchanged between the companies' MMS in a secure fashion to realize charging and billing at both companies.

The G-MMS enables the exchange of data in an anonymized way without exploiting the employees' privacy rights (privacy by design). Additionally the system will be connected to Hubeject, a German charging network.



The developed carport contains the following system components:

- IEC-61851 conformant charging points,
- lithium iron phosphate batteries
- photovoltaic modules
- connection to the company's micro-grid (monitored via smart meter)
- an industrial PC running the EMS

The needed communication between EMS, solar inverter, battery inverter, smart meter and charging station is realized via Ethernet.

About our current expectation: To get a first impression of business E-Mobility in Lippe, the business trips of our research partner Fraunhofer IOSB-INA were analyzed.

- The institute owns 2 cars for business trips (BMW 520 and Volkswagen eUp)
- For most ways for which the BMW was used, the VW eUp could have been used

instead. The eUp is mostly used within its direct reach of approx.150km without recharging

So our first impression is, that E-Mobility in Lippe will work quite well – even if it is mainly sourced by renewable and own-generated energy!

As a result of this project – which will be in its final status in 2016 - we expect an intensive increase of acceptance of e-mobility-solutions in the region.

An enclosed report about „EMiLippe“ will be available in autumn 2016.