EM-Europe Project PLATON

"Planning Process &Tool for Step-by-Step Conversion of the Conventional or Mixed Bus Fleet to a 100% Electric Bus Fleet"

Project and Consortium

The project PLATON was approved for funding in the Electric Mobility Europe Call 2016. The main objective of the PLATON project is to define a **planning process** for the conversion of a given diesel or mixed bus fleet to a 100% **electric bus fleet** and to implement this process into a **web-based software tool**.

The **consortium** consists of three research institutions (ifak Magdeburg acting as co-ordinator, UIIP-NASB and JIME-NASB), one research-educational institution (SUT), one research consultancy micro company (EUC), two bus manufacturers (Belkommunmash, VOLVO), one rail company aiming at the production of electric buses (Stadler-Minsk) and two associated public transport operators (PKM Jaworzno and PKM Sosnowiec). They represent five countries – Germany, Poland, Belarus, Sweden and Austria.

Project Partners

ifak

Silesian University of Technology

Оипи

effiziente.ST Energie +Umwelt Consulting

An Approach which is adapted to the situation is needed, when designing the transition process!

Designing the transition of a public transport fleet to 100% electric power trains will comprise:

- Staging of the fleet conversion process
- Developing and evaluating activity alternatives
- Asessing technological variants

Strategies for the conversion have to consider aspirations (requirements and expectations of the stakeholders). The process may vary, depending on the following boundary conditions to the problem:

- Topography of the operation area
- Function of the operator as private entity being commissioned, part of a city holding etc.
- Topology of the infrastructure (depots, electric grid etc.)

In the socio-economic context local government authorities may attribute different importance to economic, social, environmental and innovation factors, which influence the nature of the transition process. Local vehicle industry may create momentum offering work places in the new field of zero emission buses. Finally summarising, those settings influence the scope i.e. how far and how fast electric buses may be rolled out.

Arguments to be Considered

The motivation for transiting to electric buses might include:

- Reducing gaseous emission from diesel engines, but also partly PM-emissions from clutches and mechanical brakes

• Improving living quality in cities, reducing noise emissions from buses

• Replacing expenses for imported fuel by local investments in renewable power infrastructure – shifting money flow from oil exporting countries to reliable trade partners, and possibly regional developers/ producers of power train components or entities active in vehicle integration.

On the opposite side there are questions to be answered:

• Could there be a problem that staff is reluctant to follow over to electric power trains creating a human resources problem?

• Where does the enterprise stand in the cyclic renewal of diesel buses?

• How many systems are operated, resp. what internal departments do exist having their own stake? (also for other electric vehicle systems like tramway, trolley or fuel cell buses)

Additionally, space demand for opportunity charging and cultural heritage issues – protecting historic centres – are limiting factors, when installing overhead charging facilities.

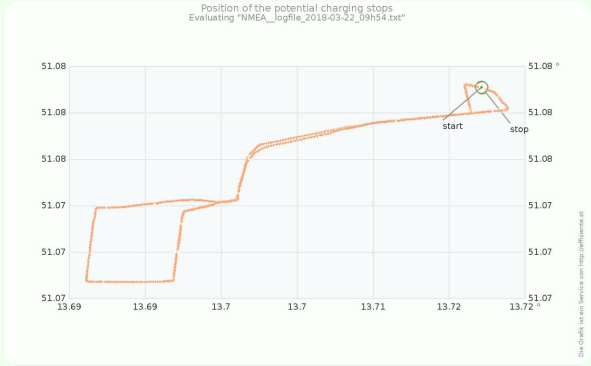
Implementation Activities

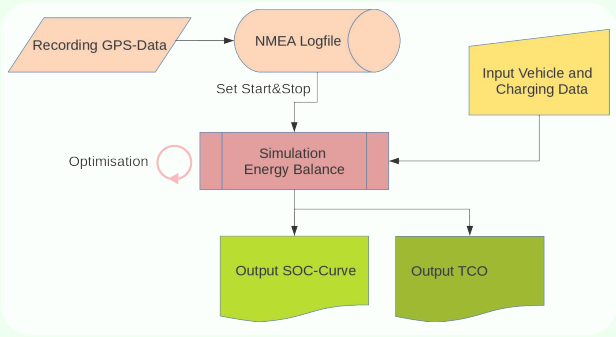
Within the project web-based tools will be developed. They will facilitate transition to a fully electric bus fleet in cities. Those tools - targeting stakeholder, but also system planners - will comprise:

• strategic decision support

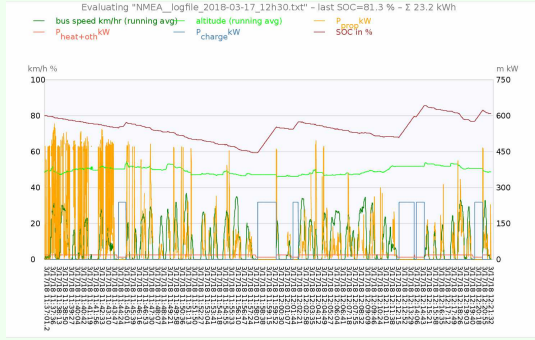
• optimisation of the bus network, minimizing total cost of ownership TCO

• modelling concrete operation for different scenarios, comprising
  - battery electric operation
  - opportunity charging
  - (partly) en-route charging.

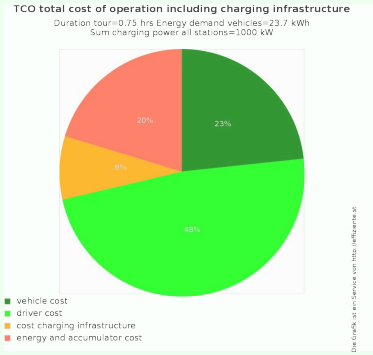




The Austrian partner EUC has committed itself to allow modelling bus operation on-line for different scenarios, based on GPS-measurements at 5 Hz. A special data acquisition system was designed, utilising two GPS mice, allowing passenger operated acquisition in the vehicle. Operators may improve quality of the logs when using battery operated roof-mounted logging units. The simulation tool so far allows input of:



- bus type and bus and charging characteristics
- cost data for buses and charging infrastructure
- definition of halts/stops with delaying charging or course stretches having continuous recharging.



The following data is varied in order to minimize cost:

- battery size
- charging power

As output of the simulation, the energy balance and the total cost of ownership is calculated. Variable passenger load and an environmental assessment will be added.

This project has received funding from the ERA-NET COFUND Electric Mobility Europe (EMEurope) within the Horizon 2020 program.
The Austrian part of the project PLATON was co-financed by the Austrian Ministry for Transport Innovation and Technology BMVIT in the call EME eMobility Europe 2016 in the program "Mobilität der Zukunft".

Bundesministerium Verkehr, Innovation und Technologie