Cluster Green Stream: e-mobility programme for Poland

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Introduction

- *A climate change together with a permanent energy crisis are becoming more real.*
- *Poland and Europe are more and more dependant on the gas and oil import.*
- *The „Green Stream" is a cluster of companies, organizations and persons who take an attempt to fight these dangerous tendencies.*

Cluster „Green Stream" – general information

- *„Green Stream" Cluster is a social coalition of the companies, organizations, SME and persons, and it runs own activity in the form of the consortium.*
- *„Green Stream" is the biggest and strongest organization promoting Electric Vehicles in Poland.*
- *Currently, among others, the following entities participate in the Cluster: the National Economic Chamber, the Association of Polish Electricians, the Institute of Electrotechnics, etc.*

Cluster „Green Stream” – general information cont.

- *Strategic goal is „to finish smoothly the „oil era” in Poland”*
- *„Green Stream” Cluster deals with manufacturing of the electrical vehicles (EVs) and necessary infrastructure, creating ecological and engineering solutions in the field of the electrical vehicles and the systems of the electrical energy production*
- *„Green Stream” wants to create the EVs market in Poland*

Cluster „Green Stream” – general information cont.

„Green Stream” Cluster goal is not only EVs implementation but it also runs and wants to run in the future R&D and purely scientific research projects and activities.

E-mobility concept

- *E-mobility stands for electric mobility (do not mix with eMobility concept, but e-mobility can utilize eMobility components.*
- *E-mobility means replacement of nowadays vehicles with EVs, (BEVs, PHEVs etc.)*

„Green Stream" projects – 1st stage

- *Electric power distribution infrastructure -330 charging points*
  - *To start the market of EVs in Poland, the „Green Stream" is building the network of electric power distribution consisting of 330 battery charging points.*
  - *Design and production of bi-directional chargers.*

„Green Stream" projects – 1st stage - cont.

- *Development of 20 EVs*
  - *„Green Stream" is building 20, different types (technologies), EVs to test them and choose the most promising solutions.*
  - *Conversion of the classic cars into EVs*

„Green Stream" projects – 1st stage - cont.

- *Development of the model workshop/garage*
  - *„Green Stream" design and builds a standardized workshop/garage for EVs service , maintenance and conversion of the classic cars.*
  - *Research base and test bed for all consortium members*

„Green Stream" projects – 1st stage - cont.

- *Monitoring and control system*

The „Green Stream" wants to develop the intelligent monitoring and control system utilizing the most modern ICT technologies, wireless communication systems, satellite navigation, network location systems, RFID, wireless sensor networks and embedded systems. It is the core problem in the context of possible V2G and G2V solutions.

„Green Stream" projects – 1st stage - cont.

- *Technical project of the Polish EV*
  - *The „Green Stream" wants to design and build completely new EV which could be a mass production EV in Poland.*
  - *City car*
  - *R&D already started*

„Green Stream" projects – 2nd stage

- *Development of the V2G infrastructure – intelligent and distributed electric power storage system (main project)*

The project concerning of all the aspect of a distributed load and distributed energy sources, for better use and stabilization of the electric power grid. Especially important in the context of more extensive use of the renewable electric power sources which are highly fluctuating.

„Green Stream" projects – 2nd stage

- *Electric power distribution system cont.– 280000 battery charging terminals (sub-project)*

This project will allow to test and implement mechanisms and algorithms for distributed load and distributed power supply for intelligent power supply management. It will also allow to run a big fleet of EVs. It will be possible to implement and test dynamic and intelligent billing system etc.

„Green Stream" projects – 2nd stage

- *Monitoring and control system – cont. (sub-project)*

The development of the EV system will need continous development of the monitoring and control system.

„Green Stream" projects – 2nd stage

- *Production of the battery charging terminals (sub-project)*

To build large network of charging facilities will need a mass production of the battery charging terminals.

„Green Stream" projects – 2nd stage

- *Production of the EV chassis (sub-project)*

To make the EVs more modern it will mean less energy consuming will need new materials and new construction of vehicles chassis to make them lighter.

„Green Stream” projects – 2nd stage

- *Electric buses (sub-project)*

The „Green Stream” plans to introduce 2000 of the electric city buses and built necessary infrastructure for them.

„Green Stream" projects – 2nd stage

- *Electric taxis (sub-project)*

The „Green Stream" plans to introduce systems of electric taxis with necessary infrastructure. According to the plans electric taxi system could be introduced for testing in the certain cities, in the preparation for European Soccer Championships.

„Green Stream" projects – 2nd stage

- *EVs rental system (sub-project)*

One of the „Green Stream" projects is to design and implement EVs rental system to promote EVs and encourage people to use them.

„Green Stream" projects – 2nd stage

- *Electric power storage systems for EVs and renewable energy sources – cont. (sub-project)*
  - *The key component for the development EVs and V2G/G2V concept are power storage system. The „Green Stream" plans to start project developing them.*
  - *Development and promotion of the micro power plants (photovoltaic, hydroelectric, wind etc.) with small energy storages*
  - *EV as a storage component*

Research areas

- *There are many research areas in the field of the „Green Stream" interests. Some of the are:*
  - *Balance of the energy supply and resources (V2G/G2V)*
  - *New dynamic billing system*
  - *Controlled battery charging and discharging*
  - *Monitoring and communication systems for grid control*
  - *New materials*
  - *New power storage systems*

- *In the course of action there will appear new research areas, which cannot be even envisioned now.*

Conclusions

- *Very well defined vision.*
- *Well established infrastructure*
  - *institutions, organizations, SME – „movement”*
  - *People (Scientists, researchers, engineers, entrepreneurs, hobbyists) who are very involved and determined to introduce this vision – they will follow the plan.*
- *Need for pilot projects alternative to gas and oil*