
Electromobility+



Electromobility+ Information Event

Brokerage Session
13 January 2011

Profiles and Project Ideas from Polish EV-related SMEs

Presented by Zbigniew Turek (IPPT PAN/NCP Poland)

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Bater and Servus Lab Profiles



Bater expertise:

- ✓ Battery manufacturer (stationary and traction batteries)
- ✓ Evaluation of batteries capacity
- ✓ Catalytic recombination plugs for batteries

Servus Lab expertise:

- ✓ Range of Li-Ion battery testers and control circuits
- ✓ Use of modern sensors in intelligent instruments
- ✓ Low power design (including free energy)
- ✓ Short range radio links (including RFID)
- ✓ Application of Design for All (DfA)
- ✓ Design for Environment (DfE) methodology

Key Dimensions of interest from the ELECTROMOBILITY+ Call: Technology based Innovation

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Bater and Servus Lab Project Idea

CALABAT - Light carbon based lead-acid battery for electric car (KD: Technology based Innovation)

Project objectives:

- ✓ Innovation revitalizing lead-acid traction battery technology
- ✓ Development and evaluation of a hybrid battery-supercapacitor system powering electric vehicle

Reasons for lead-acid battery improvements:

- ✓ Unsolved issues related to the lithium batteries (high cost, safety problems, lack of recycling facilities)
- ✓ Limitations of existing lead-acid batteries (low energy density, limited cycle life)

Current Consortium Partners:

- ✓ Bater Ltd., Warsaw, Poland (Producer of lead-acid batteries),
- ✓ Servus Design Lab, Warsaw, Poland (SME – design and test services - accumulators and supercapacitors),
- ✓ ZTNK, Radom, Poland (Producer of electric cars)

Profile of the Partners Sought:

- ✓ R&D institution (Coordinator),
- ✓ Producer of AC motors and powertrains,
- ✓ Producer of supercapacitors (Providers of equipment and expertise, partners in optimization and testing of components).

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SpinCar Profile

Our Skills:

- ✓ Designing of mobility devices of a new kind
- ✓ Research and Development (mobility devices and others)
- ✓ Owner of SpinCar patent

Key Dimensions of interest from the ELECTROMOBILITY+ Call: Technology based Innovation

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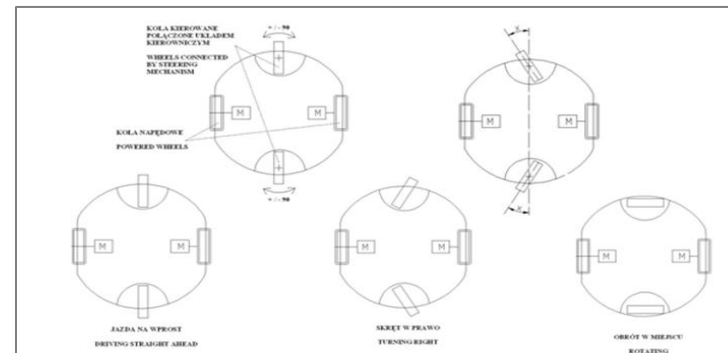
SpinCar Project Idea



Electric Four-Wheel City Car that Spins on the Spot *(KD. Technology based Innovation)*

- SpinCar* is an electric city car of a new generation, from the very beginning designed for a city life.
- Its innovative chassis design has no restrictions on the turning radius. The driver can smoothly change the turning radius from driving straight ahead to spinning around on the spot.
- SpinCar means a totally new quality of moving around the city, parking and of manoeuvring.
- SpinCar is the perfect vehicle for people in wheelchairs: it can be parked on regular parking spaces and a disabled person can stay in a wheelchair at all times during the journey.

*under patent pending protection



Comparison of max. height of centers of masses, to obtain the same parameters for stability

Dimensions	Acceleration and braking	Driving in a circle	Braking on a bend
2m x 2m x 1,5m			
Four-wheeled car	0,75 m	0,75 m	0,75 m
Three-wheeled car	0,75 m	0,37 m	0,26 m
SpinCar	0,75 m	0,75 m	0,44 m



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SpinCar Project Idea



Electric Four-Wheel City Car that Spins on the Spot (KD: Technology based Innovation)

Animation:

<http://www.sendspace.com/file/hmjwn9>

- ✓ Parking on a regular parking space
- ✓ Leaving the vehicle on the wheelchair

Partner Profile:

- ✓ We search for a Partner who will be interested in commercializing of the Idea.
- ✓ The main focus at the beginning should be put on designing a prototype of the chassis and its tests

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CIM-MES Profile

Design and development: mechanics i mechatronics, power transmission

Demonstrators and prototypes: metal, plastics, controlers, assembling

Staff: 12 permanant posts and 8 consultants

HT SME; on the market since 1987

Key Dimensions of interest from the ELECTROMOBILITY+ Call: Technology based Innovation

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**CIM-mes
projekt**

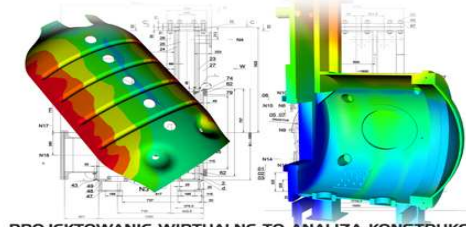
FIRMA INŻYNIERSKA Z 20-LETNIM DOŚWIADCZENIEM

WWW.CIM-MES.COM.PL

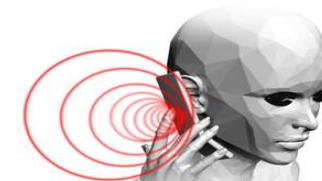
PEŁNY ZAKRES PRAC INŻYNIERSKICH
USŁUGI PROJEKTOWE I SPRZEDAŻ OPROGRAMOWANIA
JEDNO ŚRODOWISKO SYMULACYJNE
DLA KOMPLEKSOWEGO PROCESU BADAŃ



PROJEKTOWANIE WIRTUALNE TO ANALIZA TECHNOLOGII



PROJEKTOWANIE WIRTUALNE TO ANALIZA KONSTRUKCJI



PROJEKTOWANIE WIRTUALNE TO ANALIZA
ODDZIAŁYWANIA ŚRODOWISKA

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CIM-MES Project Idea



Plug-In Hybrid Electric Drive for Multipurpose Lightweight Vehicle *(KD: Technology based Innovation)*

Objectives:

New PHEV architecture for hybrid drive solution with PTO capability:

- Charge sustaining mode
- Charge depleting mode
- Electric vehicle mode
- Engine mode

PHEV hybrid drive solution for family of small multioperational vehicle for zero-emmission zones inside warehouse and in the downtown areas

Deliverables:

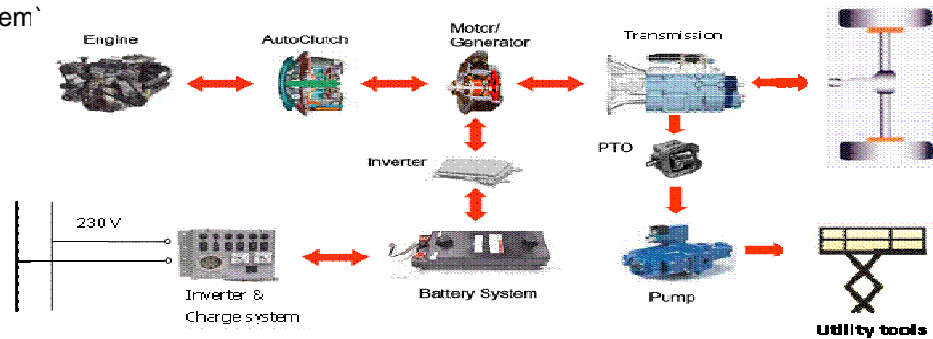
- Green-zone oriented PHEV hybrid drive system: specification and control system development
- MLV demonstrator up to 2 tons capacity of selected functionality (for example vertical transport)

Existing Partnership:

- CIM-mes Projekt (RTD, Poland, Drive architecture)
- Cracow Univ. Of Techn (Univ., Poland, Vehicle functional architecture)
- N/A (Large company, Poland, Manufacturing, basic LV)
- STAM (SME, Italy, Control system)

Additional partners sought:

- Battery manufacturers
- Municipal vehicles operator
- Warehouse vehicle operator



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Green Stream Cluster Profile



The aims of the Green Stream Cluster:

- a gradual elimination of the oil from Polish economy,
- developing the electrical vehicles market,
- creating the electrical cars market,
- promoting the renewable energy sources,
- promoting the electrical cars,
- organizing the cooperation between an education, automotive industry and energy sector,
- integrating the participants of the electrical vehicles market,
- supporting and implementing the innovative solutions in a sector of electrical cars market,
- implementing the new technologies for the electrical energy storing,
- utilizing the carbon electrical energy in out-of-peak periods,
- cooperating with the foreign entities within an implementation of the electrical cars.

Green Stream Cluster consists of 15 partners, 8 of which are SMEs.

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Electromobility+ **Green Stream Cluster** *Projects*



Proposals for cooperation:

Electric vehicles charging terminals

The subject matter of the project is to provide and test charging points located in public places (PCP) as well as charging points located on private premises of the electric vehicle users - garage charging points (GCP).

KD: 3. Strategic research on technical dimensions of the recharging, storage and distribution systems.

Supply of the equipment for monitoring stations (GPS) and preparing and conducting traction and mobility tests of electric vehicles along with the indispensable infrastructure

Aim of the project is to elaborate the monitoring system allowing to perform the test consisting in: collecting, processing, archiving and sharing data on process related with the traffic of a specified number of electric vehicles at the specified area and time.

The monitoring system includes the following elements: 1. project of the test, 2. terminals for the vehicles and sets of sensors, 3. cooperation with a scientific and research partner, 4. publication of the test's results.

KD: 3. Strategic research on technical dimensions of the recharging, storage and distribution systems.

KD: 5. Technology based Innovation

Design, construct and supply prototypes of light electric vehicles

Aim of the project would be to design, work out, construct and test the prototypes of five different light electric vehicles:

- I. mountain bike (MTB) with electric drive;
- II. light passenger and freight vehicles with electric drive;
- III. three-wheel bike with electric drive;
- IV. "bike and cart" with electric drive;
- V. innovative, light vehicle with electric drive.

KD: 5. Technology based Innovation

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Warsaw E-Mobil Cluster Profile

The aims of the Warsaw E-Mobil Cluster:

- Boosting competitiveness and innovation of Warsaw city with effective high-tech technologies transfer from R&D centres to companies;
- Fostering access to financing sources – both from EU resources and national operation programmes;
- Overcoming administrative barriers;
- Introducing new technologies to domestic market;
- Achieving synergy effect;
- Limiting the risks of operations of innovative companies;
- Concentration of research and integration of activities of companies, agencies, associations and governmental authorities of the field of propulsion: pro-ecological, electric, electric-fuel along with charging infrastructure (for EV's) and service/refuelling infrastructure (for EV-fuel);
- Boosting scientific and operational potential of Cluster Partners;
- Facilitating contacts and access to scientific, technical and business information generated by Partners;
- Improvement of status of natural habitat and life conditions of Warsaw city citizens;
- Improvement of energetic safety in Warsaw city.

Warsaw E-Mobil Cluster consists of 13 partners, 2 of which are SMEs.

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Warsaw E-Mobil Cluster *Projects*



Proposals for cooperation within ELECTROMOBILITY+ Call

1. Urban busses public transportation - recharging and swapping battery station

KD 3 - Strategic research on technical dimensions of the recharging, storage and distribution systems; in the field of:

- ✓ Technical models of battery recharge solutions
- ✓ Solutions for battery charging and exchange

2. Battery management system - SOC and SOH indication including temperature influence

KD 3 - Strategic research on technical dimensions of the recharging, storage and distribution systems; in the field of:

- ✓ Technical models of battery recharge solutions
- ✓ Battery management

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Green Wave Profile

Manufacturer of a complete system for charging electric vehicles

Previous involvements:

- Formula Students Leaders, SAE,
- University Rover Challenge Leaders, The Mars Society,
- Remote control aircraft Supervisors, SAE Aero Design

Cooperation with:

- Wroclaw City
- Wroclaw University of Technology
- Wroclaw Academy of Art and Design
- Energy Electric – smart electric and electronic producer

Product offered - Green Wave Charge Point series: G1000

- A series of G1000 terminals manufactured by Green Wave company is unique for its modern design, it adjusted to one-phase and three-phase power supply (3,7kW – 14,5kW).
- Access to terminals is possible upon prior client authorization.
- Big, colour and clear display.
- Locking Door, electric shock and over-voltage protection system highest safety standards applicable to electric devices.

Key Dimensions of interest from the ELECTROMOBILITY+ Call: Recharging and refuelling stations

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Ekotex Profile



Expertise:

- ✓ Biocomposites materials (plastic reinforced with flax or hemp fibres),
- ✓ Natural fibres for friction materials,
- ✓ Recycling of wastes : textiles; polyurethane foam,

Objectives of our proposals, foreseen deliverables :

- ✓ Production of innovate biocomposite materials for car interior parts;
- ✓ Production of innovate friction materials with natural fibres
- ✓ Processing of waste from scrapped cars – safety belts, polyurethane foam

Existing partnership :

- ✓ Wroclaw University of Technology, Insitute of Natural Fibres and Medical Plant, Fraunhofer ICT

Requirements with respect to additional partners:

Research Institutes and End Users for:

- ✓ Biocomposite materials,
- ✓ Friction materials, brake and clutch facings,
- ✓ Processed textile waste and poluurethane foam.

Skills of our organisation

- ✓ Technology of processing natural fibres for biocomposites as well as for friction materials;
- ✓ Technology of separating and processing of textile and polyurethane wastes

Topics we are interested in :

- ✓ Production of low weight and eviroment friendly – car interior parts,
- ✓ Production of new friction materials for brake and clutch facings,
- ✓ Recycling of some parts of scrapped cars,

Key Dimensions of interest from the ELECTROMOBILITY+ Call: Energy and environmental policy approach

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Impact Automotive Technologies Profile

Battery Packs and electric drivetrains development:

- ✓ Design & Engineering Department with 20 highly skilled engineers
- ✓ Battery Pack Development Team (hardware and software design)
- ✓ Mechanic department
- ✓ Pro-E 3D stations with direct tooling programming capability
- ✓ 9 ha of industrial surface in Pruszków, Warsaw area
- ✓ Battery pack lab and test bench

Impact Automotive Technologies Sp z o.o:

- ✓ 6+ years experience of designing Battery Packs based on Li-ion technology
- ✓ 5 years of cooperation with leading cell's manufacturer Kokam

List of major EV technologies and competencies:

- ✓ Battery Packs, Packing, BMS (Battery Management System), Thermal Management
- ✓ EV components (automotive chargers, ECU's, Drives, CAN data loggers, OnDash Display Modules, EV diagnostic software)
- ✓ Realized EV vehicle projects: SAM EV, 4-wheel drive ATV, EV conversions (e-Sprinter, e-Partner), paraglide drivetrain, Mobile Fast Charger (Angle Car)

Key Dimensions of interest from the ELECTROMOBILITY+ Call:

Energy and environmental policy approach

Usage patterns, economic models, actors involved

Strategic research on technical dimensions of the recharging, storage and distribution systems

Technology based Innovation

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Electric Generation *Profile*



Distributor of components for EV conversions – passenger cars and small trucks.

Provider of conversions for:

- Electric cars
- Electric bikes
- Electric boats

Key Dimensions of interest from the ELECTROMOBILITY+ Call:

Testing, trials and normative standards

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Melex Profile



Manufacturer of special purpose electric vehicles:

- Passenger (4, 6, 8 person)
- Cargo (up to 450kg lift and 4 persons)
- Special (N-CAR with up to 1000kg lift, golf, retro, ambulance)

EV accessories manufacturer/provider:

- Tops, cabins, windshields, covers, towing hooks
- EV safety belts
- Batteries and chargers
- Lighting, indicators and electrical equipment

Key Dimensions of interest from the ELECTROMOBILITY+ Call:

Energy and environmental policy approach

Usage patterns, economic models, actors involved

Strategic research on technical dimensions of the recharging, storage and distribution systems

Testing, trials and normative standards

Technology based Innovation

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