STRONG PROJECT CONSORTIUM
15 COMPANIES

INNOVATIVE LOGISTICS CONCEPTS
FOR URBAN ENVIRONMENTS

ELECTRIC VEHICLES OPTIMIZED FOR
DISTRIBUTION IN CITIES

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ELOCOT – Conference on Electromobility in Logistics and Commercial Transport, 10th June 2015
Challenges from road transport

- Transport accounts for 24.3% of EU GHG emissions (2012)
- EU GHG emissions from transport and other sectors, 1990-2012: +36%
- EU dependency on imported energy

Drivers of increased freight traffic

- Online shopping
- Increasing customer demands
- Globalization of trade

Increase in freight traffic

Development of freight transport in Austria

Quelle: BMVIT, „Gesamtverkehrsplan für Österreich“, 2012, Seite 24
Policies & Goals

- EU White Paper on Transport: 60% transport GHG reduction by 2050
  - Halve the use of „conventionally fuelled“ cars in urban transport by 2030 (phase out by 2050)
  - Achieve essentially CO2-free city logistics in major urban centres by 2030

- EU 20-20-20 climate and energy goals
  - Reduce energy consumption through efficiency measures

- Fuel quality: cut GHG intensity of vehicle fuels by 10%
Cities and urban areas as a focal point

- 75% of the EU population lives in cities
- 85% of GDP generated in cities
- 20% of traffic in European cities is due to freight transport
- 11% of CO₂ emitted in Austria is due to road-based freight transport

- New logistics concepts and technological optimizations needed to make freight transport in urban environments cleaner and more efficient
Focal points of the project

- **Innovative freight logistics** for urban environments, specifically geared towards the significant use of **electric vehicles**:
  - Optimize vehicle technologies to increase range and lower costs
  - Develop new logistics concepts and planning methods
  - Demonstrate the technological feasibility and cost effectiveness of the use of electric vehicles in urban logistics
  - Open Innovation to actively involve external stakeholders
Together, 15 leading Austrian companies are developing innovative concepts for urban logistics.

- Combined fleet of 1500 vehicles covering 64 million km per year
- ~12,500t CO₂e per year
Vehicle technologies:
Cargo tricycle

- Existing prototype with tilting technology
- Aim: optimization as a cargo transporter

EMILIA: development of an electric powertrain
- Energy efficient motor, inverter, transmission
- Pedal power boosted by electric motor

Advantages:
- Permitted as a bicycle in Austria
- Flexibility in the city (e.g. pedestrian zones, parking)
- Faster delivery
- Loading capacity: ~100kg / ½ Euro Palette
- Target range 80-90 km (level terrain, incl. cargo + driver)

Last mile delivery
- Inner City (food/grocery delivery)
- Package loading at stationary or mobile hubs
Starting point: modified Skoda Roomster (EVC)

EMILIA improvements
- Realization of an optimized electric powertrain for a light utility vehicle
- Implementation of the optimized powertrain in an existing EVC Skoda Roomster

Electric motor
- Cost reduction by 10%
- Weight reduction by 20%

Loss-loss inverter

Range extension of the EV by 15%
Vehicle technologies:
Citylog - Road train

- **HET Citylog** – road train with modular buildup
  - Hydrogen hybrid drive
  - All wheel steering
  - Electronic coupling
  - Payload 2.2t

- **EMILIA improvements**
  - Design of a lightweight structure (25%-30% lighter than 1st prototype)
  - Development of an innovative „steer by wire“ all-wheel steering
  - Extension of vehicle range
Each of the three EMILIA vehicles is modeled and simulated.

What can be calculated and analyzed:
- Energy consumption (driving range) under different driving cycles
- Energy consumption of each vehicle component
- Driving range (different driving scenarios: e.g. ambient temperature)

Vehicle Model – examples of parameters considered:
- AirConditioning
- Chassis (drag, rolling and climbing resistance)
- ElectricalSources (simple battery and e-machine models)
- Environments (ambient and cycle blocks)
- Transmissions (automatic and NuVinci)
- Treadles (human power)
- Examples (CargoBike, SkodaRoomster and Cytilog)

Data passed to routing application.
Focus on:
- Food delivery
- Parcel delivery services
- Pharmaceutical logistics

Ideas under consideration:
- Sustainable logistics for regional produce (Linz)
- Optimization of delivery runs for e-mobility (Linz, Vienna – inner cities)
- City HuB near a shopping high street (Vienna)
- E-Commerce / Home-Delivery in inner city (Vienna)
- Refrigerated logistics – e.g. for pharmaceuticals (Vienna)
Demonstration phase

- Project results will be demonstrated in the final phase of the project (2017)
- Optimized EMILIA vehicles + „standard“ battery electric / hybrid vehicles
- Well planned and executed demonstration to show:
  - Technological feasibility
  - Economic viability
  - Environmental value-added
Project data

- Project duration: 36 months (1.6.2014 – 31.5.2017)
- Total budget: 5.19 M EUR
- This project is co-funded with 2.65 M Euro by the Austrian Climate and Energy Fund and is being developed as part of the „Austrian Electric Mobility Flagship Projects“ program
THANK YOU!

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