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Deliverable 1.11

Report on the tools and good practices elicitation for the support of EV development in city logistics

Document Control Sheet

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Executive summary

Report on the good practices elicitation for the support of EV development in city logistics is the result of the activities realized under the WP1 Analysis and Development of Tools, Task 1.1 Analysis of available tools and definition of requirements. The major objective of this task was to analyse the present actions realized at the area of electric vehicles development in city logistics in the EUFAL project countries.

In recent years many activities focused on the utilization of electric vehicles in city logistics have been made. Many research studies in that respect date back at least 20 years, e.g. under projects financed by the EU, like EVD Post – Electric vehicles deliveries in postal services (1998 – 2000), ELCIDIS – Electric Vehicles City distribution systems (1998 – 2002), CIVITAS – Cleaner and better transport in cities (2002 – 2016), CO2NeuTrAlp – CO2 –Neutral Transport for the Alpine Space (2009 – 2012), TURBLOG – Transferability of urban logistics concepts and practice from a worldwide perspective (2010 – 2013), ENCLOSE – Energy efficiency in City Logistics Services for small and mid-sized European Historic Towns (2012 – 2015), SMARTFUSION – Smart Urban Freight Solutions (2012 – 2015), SELECT – Suitable electromobility for commercial transport (2012-2015). All of them introduced the different tools and measures, which can be used as the good practices for the future EV implementation in city logistics. The aim of this work package 1 is to analyse and develop the tools, which are focused on the implementation of electric vehicles, taking to the account the expectations of the urban freight transport. The detailed objectives include:

- definition tools and measures,
- analysis of available tools, taking to the account the results of the projects on electro mobility, realized on the national level (national projects and studies) and under international programmes, like ERA-NET Electromobility+, Horizon2020 projects (GV)
- deduction of requirements for further tool development (connection to WP 6 workshops),
- further development of tools (knowledge sharing between scientific and business partners)
- integration of tools in platform of exchange (as tools set for decision making process).

The initiators of the EUFAL-Project were aware from the very beginning that the topic of urban logistics with electric vehicles in Europe is just in the beginning and there is still a pioneering work to be done in all countries. But this is also a good time to start with a European information platform on this topic, as the exchange of information can be accelerated from the outset and all countries, and in particular the cities and ag-glomerations here will have a need for action for the foreseeable future.

Analysing the results of the questionnaires and also of the workshops with stakeholders of the city logistic the following first lessons learnt can be formulated:

1. **Denmark, Austria and Germany are a little ahead in electric city transport and have had some pilot projects for testing. There are also some manufacturer for EVs. This make the risk lower for the EV pioneers in city transport. Poland is starting on electric Vans and Turkey shows an interest in RetroFit strategies.**

2. **There is a broad interest on electric vehicles for city transport especially in the small and medium sector: Vans and small trucks up to 3,5 tons for postal services and delivery tasks and also for Services.**
3. **The logistic companies are very cost oriented and they are interested on TCO-analyzes and they prefer leasing models for cars, trucks but also for batteries to cover the risk of a new technology.**
4. **Some logistic companies with own fleets of Vans and trucks prefer a RetroFit strategy to adapt faster to drive-in restrictions in cities and by this means can use the vehicles the full depreciation period and even longer.**
5. **There is still a fear of restrictions in mileage by day (range-anxiety). In this case pilot projects have shown that a daily mileage of 100 to 120 km is normal for all seasons during the year.**
6. **Logistic companies have a strong interest in subsidies, because the EV are still quite expensive. This gives opportunity to learn from public-private financing strategies from other countries and will develop also new leasing and business models.**

The local workshops with participation and interaction of European partners made clear that there are some potential bilateral project opportunities in the field of RetroFit technology for small and medium trucks. There is also an interest on software to integrate EV in existing fleets. New methods of charging commercial EV by battery swapping can be also developed bilateral. This fostering of bilateral cooperation and exchange of experience is a planned output of the EUFAL platform and this can create a nucleus of a broader participation of other European countries and Stakeholder and decision makers in the platform.

Introduction

The Project EUFAL (Electric Urban Freight and Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to Integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

The analysis realized under Task 1.1 was focused on two major aspects of electromobility utilization: implementation of electric vehicles in city logistics and development of the infrastructure and environment for the EV utilization. The activities introduced in the deliverable were focused on the methodology of the city logistics electromobility good practice elicitation as well as the data collection process. The analysis was focused on the result of the other projects related to electro-mobility development in city logistics systems (reports, deliverables, analysis, descriptions of the implementation actions) in the pilot countries (Germany, Denmark, Austria, Poland and Turkey).

It is the task of Work Package 1 to create the necessary empirical basis by exploring the appropriate application examples (best practice) and tools that have been developed in partner countries in the field of city logistics and the EV designed and implemented for them. This should be done by the institutions, research organizations and companies involved in the EUFAL project in their respective countries. In the project phase, the project group initially focused on the developments and projects directly in the participating partner countries Austria, Denmark, Germany, Poland and Turkey. This was also the result of the consideration that the best way to start possible cooperative relationships and exchange of experience between the respective city logistics projects and the tools and their stakeholders developed in this process. In order to support these systematic investigations in the partner countries and to make them comparable, a questionnaire was developed for this purpose, which on the one hand should clearly present the best practice projects and the tools developed and used, but also by naming the respective stakeholders and Further links should enable a deepening of information and cooperation. The questionnaire was intended to support the main objective of the EUFAL project, which aims to tailor the information platform to be developed to the interests and information needs of the target group.

The results of the analysis will address experienced EV users, administrators and decision makers as well as the developers of EV vehicles and consultants of business models. These will provide the knowledge needed for successful EV implementations in urban freight and logistics for all stages of development.

Data collection methodology

Aim of the empirical analysis of best practice and tools

The project addresses decision makers and fleet managers in companies willing to integrate EV in commercial vehicle fleets, but also administrators in cities responsible for mobility, logistics and environment. As products of the project there will be the web-based platform of exchange which will allow users to access decision support tools provided by the project. As input for the platform of exchange EUFAL project partners will develop and integrate own tools. Developed tools for the platform of exchange will include the next stage development of the routes optimisation platform DYNATOP. It will showcase a multi-purpose city logistics system which is both economically and environmentally sustainable based on the use of EVs supported by ICT optimisation tools. The project will analyse the status of EV implementation in cities based on examples. The demonstration and evaluation of the implementation and application of electric mobility includes urban freight and city logistics in several countries. Environmental impacts of EVs in city deliveries and expectations for battery charging infrastructure development will be analysed. Use patterns of corporate fleets will be analysed and EV potentials identified. National framework and business environment for EV deployment in urban commercial transport will be assessed.

The project takes commercial transport on roads in urban environments into consideration, no other modes of transport will be analysed even knowing that electromobility is not dedicated to road transport. Commercial transport is defined as any transport related to commercial activities excluding all private traffic like commuting. In the project we explicitly take goods related transport as well as service related traffic into consideration.

The initiators of the EUFAL-Project were aware from the very beginning that the topic of urban logistics with electric vehicles in Europe is just in the beginning and there is still a pioneering work to be done in all countries. But this is also a good time to start with a European information platform on this topic of urban logistics and electric vehicles, as the exchange of information can be accelerated from the outset and all countries, and in particular the cities and agglomerations here will have a need for action for the foreseeable future. The quality, the input, the output and the acceptance of the information platform is depending of the following factors:

- Structure, personal and experience of the EUFAL project group
- Quality and structure of the questionnaire responsible for the input
- Interactivity of the information platform and the related information management (this is task of Work package 4 “Assessment of Project development” and WP 6 “Dissemination and Communication”).

Data collection process – the survey

Due to the issues mentioned above, the basis of the data collection process was the standardized interview method with utilization of questionnaire prepared as an Excel sheet. The questionnaire was dived into four areas (look please Annex 1):

- Description of good practice, tool or report

- Difficulties
- Finances
- Contact details

To achieve the comparable and easy to analyse results, the questions were based on closed answers (with some options to choose) in each possible questions.

Description of good practice, tool or report

In this part it was asked to define the quality of information: good practice, tool or report and give a short title and from which country. The status of the project should be given: from planned to finished. Essential was to tick some general keywords what type of actions were described in the example to make it in a later stage of the platform easier to search. This was followed by a number of open questions to describe the good practice, tool or report:

- Description in general
- Starting point (what was the problem?, the idea behind the project?, what makes the difference to existing solutions?).
- Objectives (what was the general goal of this action?, energy savings, cost savings, environmental restrictions, better service, new business).
- Benefits (to specify qualitative and quantitative environmental, economic and social results).
- What were the main success factors?
- Keywords (max. three characteristic keywords).
- Technology Readiness Level TRL (from 1 to 9).

Moreover, important topic related to the general description of the good practice or tool was the information about stakeholders, which were involved in this project or tool and can be approached for more detailed information, consulting and at last cooperation. For this purpose the separate Excel sheet has been prepare. This was a very communication window and was a specific item of the EUFAL information platform. It will help to start bilateral exchange of experience (B2B) and will lead in a later phase to cooperation and joint activities. This part of analysis included:

- **Business entities**, including mostly:
    - **Shippers** – this is a group that includes both senders and recipients of goods, usually retailers (small shops independent of large chains), wholesalers and manufacturers. These are customers, who use the services of carriers, who both send goods to other companies or private customers as well as receive from these items and are interested in maximizing the level of services offered to them, including cost, time of loading and transportation, reliable of transportation, as well as receiving information.

  - **Freight carriers** – this group includes external professional transport operators, logistics service providers, courier services, private providers (e.g. retailers who independently organize deliveries to their stores using their own transport), urban managers of supply centres and dispatchers. Usually representatives of this group are interested in minimizing costs associated with the collection and delivery of goods to customers, which allows them to maximize their profits; it is expected that their services will be of high quality and at a relatively low total cost, which is particularly important in cases where the expected delivery is dependent on the specific time windows.
  - **Manufacturers of commercial vehicles** – it includes mainly companies that provide transport system with components necessary for its operation: commercial vehicles (hardware) and software that supports or even determines their use. In light of the emerging new concepts and technologies for distribution of goods in the cities (electric vehicles, charging infrastructure, fleet management systems, etc.) it is worth to expand this group with manufacturers of non-conventional technologies.

- **Public authorities** (especially city administrators) – this group can be divided into administrators of urban system for goods distribution (regional authorities, municipalities, municipal managers of supply centres), other administrators, providing inputs to the system (planners, policy makers, infrastructure managers) and supporting institutions (such as chambers of commerce, associations of cities, etc.). This group of stakeholders is focused primarily on the development of the city and increase of employment opportunities, and is also interested in limiting congestion, the impact of transport on the environment and increase of road safety in the city. Its members should be neutral and play a key role in resolving conflicts between other interest groups involved in the execution of supply in urban areas.
- **Research entities** – this group covers all kinds of institutions, which are focused on research and analysis related to the transportation, logistics, environmental or other issues related to the development of electromobility and sustainable city logistics development.
- **Associations** – in terms of group of stakeholders, which are associated as a one less or more institutionally entity, like branch associations, competence groups, etc.
- **Other** – this group includes both city residents as well as the other city users (for example, commuters and visitors to the city, but not living in it), people who come to the city to do shopping, and any other road traffic participants such as store owners, developers, associations and organizations of citizens and consumers; this group is not favourable to big commercial vehicles entering the city, even when these vehicles provide them with necessary products, due to the fact that it prefers the minimum level of congestion, low noise and pollution, and it expects the reduction in the number of accidents.

Challenges

As every innovation, electric mobility in city logistics is not a simple matter of just doing it but is mostly confronted with a lot of challenges on different levels like technical, financial, political and social side. Especially in good practice examples, which are successfully implemented, it would be very helpful for followers to learn about those challenges and how to overcome them. This is also a unique feature of the EUFAL information platform and will help to implement new approaches in city logistics.

Finances and business models

Especially city logistic is very sensitive on costs and every innovation and other changes are checked carefully on financial issues. Therefore Total Cost of Ownership calculation (TCO) are special tools to evaluate good practice examples. In addition EUFAL will also use Canvas Business Models to evaluate new city logistic models (see also a general Business Canvas Model in Annex 1 and also as an example the UBER private Taxi concept analysed by a canvas business model). Following this canvas business model a business model can be described and characterized by categories (look please Annex 2):

1. Core business:
    a. Key Partners
    b. Key Activities
    c. Key Resources
2. Customer:
    a. USP Unique Selling Proposition
    b. Customer Relationship
    c. Customer Segments
    d. Distribution Channels
3. Cost/Revenue:
    a. Cost Structure
    b. Revenue Streams

Using the nine categories to describe a given business model will help to understand if an individual business model is valid and economically growing. This is necessary to make the stakeholder and decision maker in the city logistic business aware of the chances and opportunities of implementing electric mobility in city transportation. In the next steps of the EUFAL project selected examples of city logistics concepts will be analysed by canvas models.

Data collection process – the complementary analysis

Parallelly to the survey mentioned above, the additional analysis have been made by project partners.

MUS with support from other partners realized in-depth analysis of available scientific papers. The basis of this part of work was the keywords assessment method. The queries have been asked on two the most important and valuable data bases – Since Direct and Scopus. The analysis covers only the newest papers (published from the 2000 till 2018).

To get more input in the information platform the DLR started a broad research to find more best practice, tools and report on city logistics in Germany. As a result of researching sources of information in Germany for the exchange and in-formation platform in Task 1.1 (Analysis of available tools), a tableau has been created that lists possible content of the platform. The list contains the following contents:

- (A) best practice examples of the use of electric vehicles in commercial transport,
- (B) projects, project lists and research programs on electric mobility in commercial transport,
- (C) information on associations, institutions and platforms dealing with the topic,
- (D) guide and decision support tools,
- (E) promotions.

Data sources

The following 5 input categories have been defined in the context of the platform implementation:

1. **Descriptions of the implementation actions (good practice)** – the measures which are the way of running a business or providing a service that is recognized as correct or most effective. They are not only a practices that are good, but also that have been proven to work well and produce good results, and are therefore recommended as models. Successful experience, which has been tested and validated, in the broad sense, which has been repeated and deserves to be shared so that a greater number of people can adopt it.
2. **Result of the other projects focused on electro-mobility** – it includes the reports, deliverables, analysis of the projects on national and international level (mostly ERA-NET Electromobility+, Horizon2020 projects).
3. **External and independent reports and analysis** – the achievements and deliverables of external entities, like associations, research institutes, agencies etc., which are focused on analysis of the EV as well as infrastructure for EV. It will includes also the analysis (including comparative analysis) of the technical parameters of EV (especially vans).
4. **Software (including on-line applications)** – the software tools, which could support the EV development in city logistics.
5. **Scientific papers and presentations** – the achievements of the researchers introduced at scientific conferences and/or published in conference proceedings as well as in scientific journals.

The EUFAL information platform will address experienced EV users, administrators and decision makers as well as developers of EV vehicles and consultants of business models.

The initial research area - EUFAL Project group

The data collection of best practice examples and the presentation of the tools for planning and controlling urban logistics has been realized at the level of the partner countries involved:

Austria: As a national research institute, the Austrian Institute of Technology GmbH AIT is represented in the majority of the Austrian federal states with branches or subsidiaries and thus has a good insight into the national development of the electric mobility and urban logistics research and pilot projects. AIT is also direct involved in research- and pilot-projects in cooperation with industrial partners like Direct Parcel Distribution Austria GmbH (DPD).

Denmark: The Danish consortium is headed by DTU Management Engineering, an institute of the Technical University of Denmark (DTU), with expertise in system analysis, system design, operations research, sustainability analysis, technology and innovation management and transport. The DTU has a broad research basis, and activities are planned with special focus on the interdisciplinary aspects of transport challenges. DTU participates actively in national and international (including EU) research co-operation and in its coordination. Further partners of the consortium are Copenhagen Electric and the Municipality of Copenhagen. Copenhagen Electric is a public institution which will act as a facilitator in knowledge transfer from university and the roll-out demonstration in Copenhagen. Industrial partner is also M.T.Hojgaard S/A a construction company which will switch the company car fleet to EV.

Germany: DLR Institute of Transport Research as the coordinator of EUFAL was involved in the electric mobility research from the very beginning. On national level Germany has started the electric mobility strategy with two nationwide research and development programs: “Electromobility Model Regions obility 2009-2012” (8 regions) and “Electric Mobility Showcase2013-2016” (4 regions)[1]. In both programs there were city logistics projects in which DLR Institute of transportr research as research partner and empro GmbH as commercial partner were active involved. Both programs will be used to find best-practice cases and tools for city logistics via EV.

Poland: The Faculty of Economics and Transport Engineering, Szczecin, Poland, is the faculty of the Maritime University of Szczecin (MUS) - the public technical university. This Faculty has many experiences related to city logistics, especially focused on environmental impact of urban freight transport systems as well as the city-port problems. It will be focused on the analysis at the area of Poland and works close with the two cities Szczecin and Stargard.

Turkey: The Turkish consortium is led by Istanbul Technical University with its industrial partner, an integrated logistics services provider, Borusan Lojistik which leads the Turkish logistics sector with 44 years of experience and 3500 strong workforce. Services are

[1] Source: https://www.schaufenster-elektromobilitaet.org/en/content/index.html

organized under four main sections: Domestic Logistics, Project Logistics, International Transportation and Port services.

Results of data collection (current status)

The survey results

The partners of EUFAL have agreed on the questionnaire (look please Annex 1) and in May 2018 started the send out. During regular telephone-conferences between the partners of EUFAL a feedback on best-cases and tools were requested and soon it became clear that it would be necessary to invest more time and communication to find out best-practice examples in the partner countries. Based on these interviews and the analysis of project reports the questionnaire was completed by the EUFAL partners. By October 2018, 15 questionnaires on best practice examples and tools were returned (look please Annex 3). This feedback gave a first basis for an input into the information platform. Finally, 11 good practices and 4 tools have been identified. The general summary of activities identified under the survey is introduced in the table 1.

Table 1. Feedback from the first send-out of the questionnaire (22.10.2018)

No	Shortcut	Abstract	Remarks
Austria			
A1	EMILIA	Parcel delivery and collection with EVs in a regular time schedule and planned opportunity charging	Route optimization with predefined time horizons
A2	VECEPT	Fleet optimization tool to gradual integrate EV in existing fleets	Fleet management software
Denmark			
D1	Vehicle to Equipment V2E Power Box	Seven Electric Vans with a separate battery power box for tools for maintenance and repair of bus shelters and advertising boards	TCO shows equality of EV and Diesel
D2	GreenMile	Communication and funding program to make city logistics in Copenhagen green	Program just started. Public private partnership, dialog with the regional logistic companies, public funding of transition to EV
D3	Transport of blood samples with EVs	Route and fleet optimization with battery considerations and time constraints caused by the blood samples	dynamic routing software includes battery consumption and the deterioration of the blood samples
D4	SELECT	SELECT (Suitable ELEctromobility for Commercial Transport) examines the actual state and expected development of EV in commercial transport in different European countries and derives recommendations addressing the broad range of stakeholders including policy, industry, and users.	EU Project. Focus on the use of EV for commercial transportation, i.e. the transportation of goods as well as the transportation of people for commercial purposes. Different solutions to support the customers' shift from conventional to electric vehicles was proposed.
D5	Logistics with big electric Vans	A leading construction and civil engineering company has a large fleet of big Vans (kind of FIAT Ducato or Mercedes Sprinter) for technical services with heavy loads. Decision support tool for the ideal ratio between	Will be tested in real life logistics.

		Internal Combustion Vehicles (ICV) and EV. Analysis of battery consumption to develop a model for a mixed fleet and a job assignment for EVs.	
D6	Citylogistik KPH	Consolidated Citylogistik with EV in the old centre of Kopenhagen with an urban consolidation centre UCC outside.	last mile B2B-solution from UCC to retailers in the centre. Similar to Dutch Binnenstad citylogistik service.
Germany			
G1	StreetScooter	EV special developed and built for postal services in cities. Meanwhile StreetScooter became a platform for all kind of city transport tasks.	Developed by Technical University. Car production by Deutsche Post, low cost EV
G2	GraphHopper Directions API	This tool is a commercial online software for optimizing routes and tours in freight transport. The open source project jsprit is linked to OpenStreetMap for simulating the tours at infrastructural level.	For EUFAL project, only the open source tool jsprit is used to show the potentials and the advantages of electric vehicles in comparison to traditional vehicles with regard to transport costs and environmental effects.
G3	GreenPack	smaller EVs for different transportation tasks with small swap batteries (moveable) which can be charged and swapped easily (48V) in office, charging stations through an automated dispenser or at home.	Scooter, Trike, small car (like Twizy), Cargo-Bikes and many more. Good example for an innovative charging strategy for commercial EVs which cannot afford long charging time.
G4	UPS EV conversion	UPS as an international City Logistic company rebuilt the medium sized trucks (ICV) to EVs	UPS uses a specialized workshop EFA-S GmbH for conversion (retrofit-strategy)
G5	Baker Schüren	Baker Schüren owns a chain of bakers shops in Western part of Germany. He is a fan of renewable energy and organized more than 100 bakers and started a request to the German automotive companies for a light EV truck in form of a competition. Perfect example of a market driven approach for commercial eVans and light eTrucks for City transport.	At the end StreetScooter (G1) won the competition and Baker Schüren and his companion bakers started to use the StreetScooter as a platform for all kind of special food logistics in cities.
Poland			
P1	Green mile cold chain	Independent powered cooling box with battery and PV for all kind of vehicles	Start-up company
Turkey			
T1	Project hepsi-express: fast distribution services and logistics	Integration of EVs in the fleet for freight distribution of an online store in İstanbul. Conventional fossil fuel light commercial vehicles (ICV) are converted to EVs by a local producer and adopted for distribution activities in four regions of İstanbul	Conversion strategy (retrofit-strategy)

The analysis of the received data helped to find the differences in the EV implementation level. Germany and Denmark are the most active countries in this data set (accordantly 6 and 5 good practices collected). In Austria 2 activities have been identify and in both Poland and Turkey only 1. It doesn't mean these countries are not focused on electromobility development. The most important finding from this part of analysis is that Austria, Poland and Turkey started already this kind of activities in city logistics. It should be mentioned that the analysis were focused on utilization of EV in urban freight transport only, not in generally. Due to that the number of good practices and tools is not as impressive as it could be in the analysis of development of EV in passenger transport.

In-depth analysis of questionnaire helped to find some important conclusions related to the structure and specificity of implementation processes.

First of all it should be mentioned that 2 of analysed activities is under preparing stage ("GreenMile" and "Fleet deployment and route optimization for the delivery of blood samples", both in Denmark). Moreover, 7 of them is at on-going stage. It means that practically only 5 activities could be analysed as the finalized examples for the stakeholders.

The activities are mostly focused on more than one types of actions (Tab. 2). Usually, these actions include vehicle procurement, vehicle deployment, as well as the experiences (good practices and use cases), fleet mix and technology of electric vehicles analysis. Only one activity was focused on charging infrastructure (Greenpack). It results from the fact that most of analysed activities have been realized by private sector. Also it's very important, that many actions have been focused on development of tools, which could help to develop and manage the electric vehicles fleets, like TCO calculators, route optimization considering the charging infrastructure, optimization and planning of charging stations infrastructure and optimization of charging processes and systems. Additionally, it should be underlined that 7 actions have been support by research institutions. It shows that research stakeholders are very interested and active in the development of electromobility in city logistics. Important remark from the analysis is that public authorities should be more active (only 4 actions have been realized in cooperation with them). Also only 2 examples have been based on the public-private partnership. 7 activities included the actions not stated in the questionnaire, added as others:

- e-logistics,
- route and fleet optimization with battery considerations,
- retrofit strategy ICV to EV,
- market driven approach by a specific group of customers,
- custom oriented design of EV,
- swap battery, charging batteries,
- tour optimization tool
- solving vehicle routing problems.

Table 2. Number of activities in relation to the type of actions

Type of action	Number of activities
vehicle procurement	9
fleet mix	6
vehicle deployment	8
charging infrastructure	1
logistics structure	5
business models	3
technology of electric vehicles	6
subsidy, funding, measures	4
experiences (good practices and use cases)	8
special tricks and tips	2
TCO calculators	2
route optimization considering the charging infrastructure	1
optimization and planning of charging stations infrastructure	1
optimization of charging processes and systems	1
other	7

Regarding challenges, the survey helped to identify 24 different issues related to all included categories (technical, financial, political and partnership issues) as well as 5 additional, not defined in the questionnaire. Table 3 introduces all challenges mentioned under the research.

Table 3. The challenges identified under the survey

Challenge category	The issue
Technical challenges:	Development of an optimization algorithm to include positions of charging stations for electric delivery vehicles and existing customer services (delivery and pick-up).
	Creating low consumption and low weight refrigeration system powered by the 48V DC., creating own control and energy saving system, adaptation of the inverter and BLDC systems for mobile refrigeration.
	Developing a construction kit for retrofit.
	Developing a requirement specification for food logistic.
	Competence in electromobility, team work of professors, staff and students.
	Developing a swappable and movable small battery and developing an automated dispenser with charging function , charring a cluster of batteries.
Financial challenges:	To reach the desired volume in terms of subscribing retailers.
	Cost effectiveness through bigger numbers of retrofitted trucks.
	Cost effectiveness through bigger numbers of ordered EVs.
	University offered staff, professors, laboratories, premises and research money. Regional government gave subsidies, premises for industrial change and future oriented jobs. Shareholder is 100% Deutsche Post DHL Group.
	Financial challenges are overcome by using alternate financing options, such as leasing.
	Standard Vehicle Routing Problems (VRP) tools are expensive in use and not flexible for customer problems.
Political challenges:	To be allowed by the authorities to give priority to the city logistics service rather than the usual suspects such as DHL, UPS, etc.

	Using interest groups, lobbying.
	Regional government was very proactive because of Opel crisis in the region of North Rhine Westfalia.
	Before the start of the project, conflicts emerged within the management on the feasibility of the vehicles.
Partnership challenges:	Cooperation of UPS with a small but specialized company.
	Using the power of networks and associations.
	Close partnership University - Streetscooter.
	Cooperation with several companies and also with Technical University.
Other challenges:	The determining factor for further dissemination of V2E technologies and electrical vehicles is that there is a demand from costumers - of which the public purchases constitutes a major part. Public purchasers are generally expressing interest in environmental and climate friendly initiatives such as V2E and fossil free transport. They do, however, have concerns about quality and cost, and the strong political focus on these parameters means that green parameters rarely are included in tender processes.
	Original contact person has left DTU and the information for this section is not available.
	The EVs of the Streetscooter family is sold on a broad basis to logistic companies, handicraft companies with a focus on city transport.
	Designing special EVs for seniors with cargo facilities.
	Standard VRP tools are not flexible enough to allow integration into customers environment, unclear optimization algorithms prevent users from understanding process of optimization.

The analysis helped to identify the major sources of the actions financing. Mostly national projects (8 actions) and own founding (6 actions) were used as the sources of money. It should be underlined that in 7 cases the were more than one source of founding (mostly national and EU projects). Only two examples are based on local/regional financial support or co-financing under public-private partnership. This is important finding from the analysis. The local and regional stakeholders should be more active in the support of city logistics electromobility implementations. Especially taking to the account the expectations regarding charging infrastructure development.

The complementary analysis results

Under the scientific papers assessment two queries have been used:

- to assess the total number of papers focus on electromobility issues - (TITLE-ABS-KEY (electromobility) OR TITLE-ABS-KEY (electric AND vehicle) OR TITLE-ABS-KEY (charging AND station) OR TITLE-ABS-KEY (charging AND infrastructure))
- to assess the total number of papers focus on electromobility issues in city logistics - (TITLE-ABS-KEY (electromobility) OR TITLE-ABS-KEY (electric AND vehicle) OR TITLE-ABS-KEY (charging AND station) OR TITLE-ABS-KEY (charging AND infrastructure) AND TITLE-ABS-KEY (city AND logistics) OR TITLE-ABS-KEY (urban AND freight AND transport))

The results of the analysis is introduced in table 4. There should be underlined two major remarks related to the scientific papers activities realized from 2000 year:

- The number of the papers focus on electromobility topics significantly increasing from 2000 (more than 12 times, from 796 in 2000 to 9725 in 2018). It means that scientist are year by year more interested in this issues and more research are realized in recent years.
- The number of papers focus on utilization of electromobility in city logistics is significantly less than the number of papers focus on electromobility generally. It shows that the works like EUFAL project are critical important for the improvement of the development in this area. Moreover, it shows that EUFAL platform of knowledge sharing seems to be very valuable and important in this context.

Table 4. The number of scientific papers identified in Scopus and ScinceDirect.

Year	Number of papers per database			
	Scopus		SinceDirect	
	in total	*focused on city logistics*	*in total*	*focused on city logistics*
2000	796	2	126	0
2001	871	0	109	0
2002	934	0	120	0
2003	1301	1	105	0
2004	1575	2	132	0
2005	1753	2	132	0
2006	2094	2	134	0
2007	2270	1	127	0
2008	2606	3	142	0
2009	3289	5	181	0
2010	4005	8	252	1
2011	4482	4	310	1
2012	5734	4	440	2
2013	5807	16	539	1
2014	7092	21	763	7
2015	7142	23	915	1
2016	7683	35	1028	5
2017	8772	74	1226	3
2018	9725	25	1349	6

The additional analysis made by German partners helped also to find additional conclusions. The search results include a preliminary assessment of their relevance to the EUFAL information and exchange platform. The assessment was carried out by the reviewers on the basis of expert knowledge based on the degree and scope of the information content for users of the information and exchange platform. Entries are shortened for better clarity (Table 5). Standing for Germany in doing so As a result, a tableau of about 50 entries is available. The tableau was also checked by the eM-Pro task lead. Together, other content was identified (see table 1 in the interim Report). The tableau was made available to the international project partners. The tableau will be included in the further project work evaluated on best practice examples, tools and reports on city logistics, thus expanding the above European tableau of the EUFAL platform. The same is done with the following tableau 2 on TCO examples.

Table 5. List of possible best practice examples, tools and reports (Germany)

No	Rele-vance	Theme	Subtopic	Title
A-01	high	Best practice	EV use	E-Fahrzeug-Einsatz Streetscooter bei DHL (schon von Dir erledigt), begleiten und ausbauen – verschiedene Fahrzeuge
A-02	high	Local ini-tiative	EV use	Initiative des Bäckermeisters Schüren
A-03	medium to high	Best practice	EV use	E-Fahrzeug-Einsatz bei Lidl (Meyer Logistik) – Kostenteilung mit Subunternehmer
A-04	medium to high	Best practice	EV use	E-Fahrzeug-Einsatz bei Rewe (Meyer Logistik), eForce wie auch bei Lidl
A-05	medium to high	Best practice	EV use	E-Fahrzeug-Einsatz bei Meyer&Meyer?
A-06	medium	Best practice	EV use	E-Fahrzeug-Einsatz bei UPS, EFA-S Baden-Württem-berg
A-07	medium	Best practice	EV use	Mosolf https://www.mosolf.com/ auch UPS und EAF-S
A-08	medium	Best practice	EV use	DPD – E-Fahrzeuge-Einsatz
A-09	medium	Best practice	EV use	Messenger – Fahrzeuge im Einsatz
A-10	medium	Best practice	EV use	Obeta (aus Project, Fahrzeuge im Einsatz)
A-11	medium	Best practice	EV use	Hermes
A-12	medium	Best practice	EV use	BVG – assoziierter Partner! – Aktivitäten E-Fahr-zeuge
A-13	medium	Best practice	EV use	Karabag Hamburg Fiat 500 + Ducato – Hamburger ModellProject
A-14	medium	Develo-per	Battery deve-lopment	Greenpack
A-15	low	Best practice	Micro consolida-tion and cargo bikes	Lastenfahrradeinsatz bei UPS in Hamburg, Mikro-konsolidierung
A-16	low	Develo-per	Battery deve-lopment	Stromspeicher – Batteriedoppelnutzung (siehe auch Karabag), Second live
B-01	high	Project	ERA-NET EME	List of projects
B-02	high	Project		Wechselbatterien Route Charge
B-03	high	Funding initiative	Research and development	Modellregionen Electromobility
B-04	high	Funding initiative	Research and development	Schaufenster Electromobility

No	Relevance	Theme	Subtopic	Title
B-05	medium	Funding initiative		IKT für Electromobility (I/II/III)
B-06	medium	Project		DisLog – Zustellerassistenzssystem (Daimler?) Frau Dörnemann? Sprinter/Hermes
B-07	medium	Project		NaNu! plus ParallelProjecte, Schönewolf, 12 Tonner, Wechselbatterien, Höfermann, Route Charge à Abdolrhamini
B-08	medium	Project		Smart E-User (VIOM) http://www.emo-berlin.de/de/infothek/archiv/schaufenster/Projecte/gueterverkehr/smart-e-user/ (DLR-Beteiligung)
B-09	medium	Project		(search for project name)
B-10	medium	Project	ERA-NET Electromobility+	SELECT
B-11	medium	Project	ERA-NET Electromobility+	SCelecTRA
B-12	medium	Project	ERA-NET Electromobility+	eMAP
B-13	medium	Project	ERA-NET Electromobility+	DEFINE
B-14	medium	Project		ePowered Fleets Hamburg à Tool
B-15	medium	Project		Wirtschaft am Strom Hamburg TUHH, Christian Rudolph (DLR) fragen
C-01	high	Platform	National	Electromobility vor Ort, BMVI+NOW (aber auch als Quelle nutzen)
C-02	medium	Facility	Electromobility	NOW
C-03	medium	Local initiative	Local	HySolution (Projecte in Hamburg)
C-04	medium	Local initiative	Local	eMO
C-05	medium	Platform	National	Nationale Platform Electromobility
C-06	medium	Association	Electromobility	BundesAssociation eMobilität (BEM)
C-07	low	Conference	Local/National	Berlin: Hauptstadt Conference Electromobility
C-08	low	Local initiative	Local	WFBB Roundtable

No	Relevance	Theme	Subtopic	Title
C-09	low	Platform	National	Forum Electromobility (eingestellt)
C-10	low	Association	Electromobility	BSM BundesAssociation Solare Mobilität
C-11	low	Association	KEP	BundesAssociation der Kurier-Express-Post-Dienste e.V. (BdKEP)
C-12	low	Association	KEP	BundesAssociation Paket und Expresslogistik e. V. (BIEK)
D-01	very high	Tool	Cost calculator	TCO-Rechner Ökoinstitut
D-02	very high	Tool	Cost calculator	TCO-Rechner DLR-FK (proEME, ERA-NET EME)
D-03	high	Tool	Fleet optimization	VIOM-Tools (verschiedene Ausrichtungen)
D-04	high	Tool	Tour and routing optimization	jsprit
D-05	medium	Tool	Guide	Starterset Electromobility – siehe auch andere Leitfäden, was für kommerzielle Nutzung, zum Teil für Kommunen
E-01	high	Promotion	Sales appeal	Umweltbonus

As a result of the research in task 1.1 (analysis of available tools), there is still an over-view of 25 TCO tools and sources of information (Table 6). TCO tools (Total Costs of Ownership) and literature on TCO calculation were researched, which serve as the basis for further content of the exchange platform. Again, the Relevance for the Plat-form was carried out on the basis of The Reviewers ' expertise by the Degree and Scope Of the Information content for the users Of the Exchange Platform. An Evaluation of these Sources is used to provide Information for Companies in the Platform and thus to address the problem of lack of Information among Companies.

Table 6. Overview of 25 TCO-tools und Information sources (Europe)

Relevance	Type of a tool	Source
high	Guide, online	starterset-elektromobilität.de
high	Online tool	Vorarlberger Kraftwerke AG (AT)
high	Online tool	Schaufenster/Oekoinstitut/VDE
high	TCO tool	DLR-VF CCS
high	Online tool	IKA RWTH Aachen
high	Dissertation with model and results	Danny Kreyenberg
high	Study with detailed model description	Fraunhofer ISI, Aladin
high	Working paper with analysis	Fraunhofer ISI
high	Study project with model description, eco-institute	Stephan Leppler
medium	Short study with results	Progenium

Relevance	Type of a tool	Source
medium	Paper with individual result	electrive.net, P3
low	Online article with result table	ADAC
low	Results table	ADAC
low	Reference to study results	Progenium
low	Reference	Schaufenster/Oekoinstitut/VDE
low	Online post with some numbers	Wirtschaftswoche
low	TCO tool for IT	PHW highschule Wirtschaft (?)
low	Summary of results	electrive.net
high	TCO tool (Excel, link to webpage)	Tom Lombardo
medium	Study	Web
medium	Paper	KTH The Royal Institute of Technology, Sweden
medium	Blog	Web
medium	Paper	ETH Zurich
medium	Paper	VUB MOBI
low	Online tool	Webseite, Indien

Summary

From the outset, it was clear to the EUFAL working group that current situation of the use of Electric Mobility in city logistic is on very different levels of development in the partner countries. This has been considered as a particular challenge and is seen as one of the future task of the information platform of accelerating and cooperation-enhancing between the partner countries. However, this communicative and cooperative cross-border approach requires that the Partners involved can provide the necessary human resources or create an economic basis through the resulting collaborations. This will be the focus of Work Package WP 5 (Exploitation and Action for Replication).

After the feedback of the first round of questionnaires it became clear that it would be necessary to invest more time and communication to find out best-practice examples, tools and reports on city logistic in the partner countries. According to the very early stage of EVs use in city logistics the questionnaire could not be sent out directly to institutions, companies and stakeholders. The questionnaire could only be used as a guide for interviews with responsible persons and stakeholders. Based on these interviews and the analysis of project reports the questionnaire was completed by the EUFAL partners. By October 2018, 15 questionnaires on best practice examples and tools were returned. This feedback gave a first basis for an input into the information platform.

In the meantime results of the national workshops will be available (see also WP2 D 2.11) which were finished end of last year and the demands and expectations of the stakeholders will be also used to adopt the questionnaire to fit the aims of the information platform.

Analysing the results of the questionnaires and also of the workshops with stake-holders of the city logistic the following first lessons learnt can be formulated:

- Denmark, Austria and Germany are a little ahead in electric city transport and have had some pilot projects for testing. There are also some manufacturer for EVs. This make the risk lower for the EV pioneers in city transport. Poland is starting on electric Vans and Turkey shows an interest in RetroFit strategies for trucks.
- There is a broad interest on electric vehicles for city transport especially in the small and medium sector: Vans and small trucks up to 3,5 tons for postal services and delivery tasks and also for Services.
- The logistic companies are very cost oriented and they are interested on TCO-analyses and they prefer leasing models for cars, trucks but also for batteries to cover the risk of a new technology.
- Some logistic companies with own fleets of Vans and trucks prefer a RetroFit strategy to adapt faster to drive-in restrictions in cities and by this means can use the vehicles the full depreciation period and even longer.
- There is still a fear of restrictions in mileage by day (range-anxiety). In this case pilot projects have shown that a daily mileage of 100 to 120 km is normal for all seasons during the year.
- Logistic companies have a strong interest in subsidies, because the EV are still quite expensive. This gives opportunity to learn from public-private financing strategies from other countries and will develop also new leasing and business models.
- The local workshops with participation and interaction of European partners made clear that there are some potential bilateral project opportunities in the field of RetroFit technology for small and medium trucks. There is also an interest on software to integrate EV in existing fleets. New methods of charging commercial EV by battery swapping can be also developed bilateral. This fostering bilateral cooperation and exchange of experience is a planned output of the EUFAL platform and this can create a nucleus of a broader participation of other European countries and stakeholder and decision makers in the EUFAL information and exchange platform.

In the meantime results of the national workshops will be available (see also WP2 D 2.11) which were finished end of last year and the demands and expectations of the stakeholders will be also used to adopt the questionnaire to fit the aims of the information platform.

Annex 1: Questionnaire Template

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report (see also Tab "Sources")

a) **Name of the (select one):** ☐ Good Practice ☐ Tool ☐ Report

b) **Country**

c) **Current status:** ☐ planned ☐ under preparing ☐ on-going ☐ finished

d) **Duration of the action:** **Month**

e) **Type of action (choose please as many as you need):**

☐ vehicle procurement
☐ fleet mix
☐ vehicle deployment
☐ charging infrastructure
☐ logistics structure
☐ business models

☐ technology of electric vehicles
☐ subsidy, funding, measures
☐ experiences (good practices and use cases)
☐ special tricks and tips

☐ TCO calculators
☐ route optimization considering the charging infrastructure
☐ optimization and planning of charging stations infrastructure
☐ optimization of charging processes and systems

other:

☐
☐

☐

f) **Developed by:**

- ☐ public authorities
- ☐ public-private partnership
- ☐ private sector
- ☐ association
- ☐ research entity
- ☐ other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results
(e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

k) **What were the main success factors**

l) **Keywords** (please write just three most characteristic keywords for your example)

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☐ Technical challenges:

☐ Financial challenges:

☐ Politicial challenges:

☐ Partnership challenges:

☐ Other challenges:

3 FINANCES

a) **What was the total cost of the action?** **Euro**

b) **How was the activity financed?**

☐ Own funding ☐ Co-financing (e.g. PPP) ☐ Local/Regional project ☐ National project ☐ EU project

☐ Other:

c) **Is there a business model described in the good practice, report or tool?**

if yes, Mr. Allesch will contact you to create a eMobility Canvas Model (fill in also 4 c))

4 CONTACT DETAILS (if relevant)

a) **Address details**

b) **Link to the web-site (if applicable)**

c) **only for EUFAL Test: please fill in your name or a shortcut and a phonenumber/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

eufal

Electric Mobility Europe

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)	Description

Contact details	**Link**

Sources

Text from scope and common understanding:

1. Descriptions of the implementation actions (g**ood practice)** – the measures which are the way of running a business or providing a service that is recognized as correct or most effective. They are not only a practices that are good, but also that have been proven to work well and produce good results, and are therefore recommended as models. Successful experience, which has been tested and validated, in the broad sense, which has been repeated and deserves to be shared so that a greater number of people can adopt it.

2. Result of the other projects focused on electro-mobility – it includes the reports, deliverables, analysis of the projects on national and international level (mostly ERA-NET Electromobility+, Horizon2020 projects).

3. External and independent reports and analysis – the achievements and deliverables of external entities, like associations, research institutes, agencies etc., which are focused on analysis of the EV as well as infrastructure for EV. It will includes also the analysis (including comparative analysis) of the technical parameters of EV (especially vans).

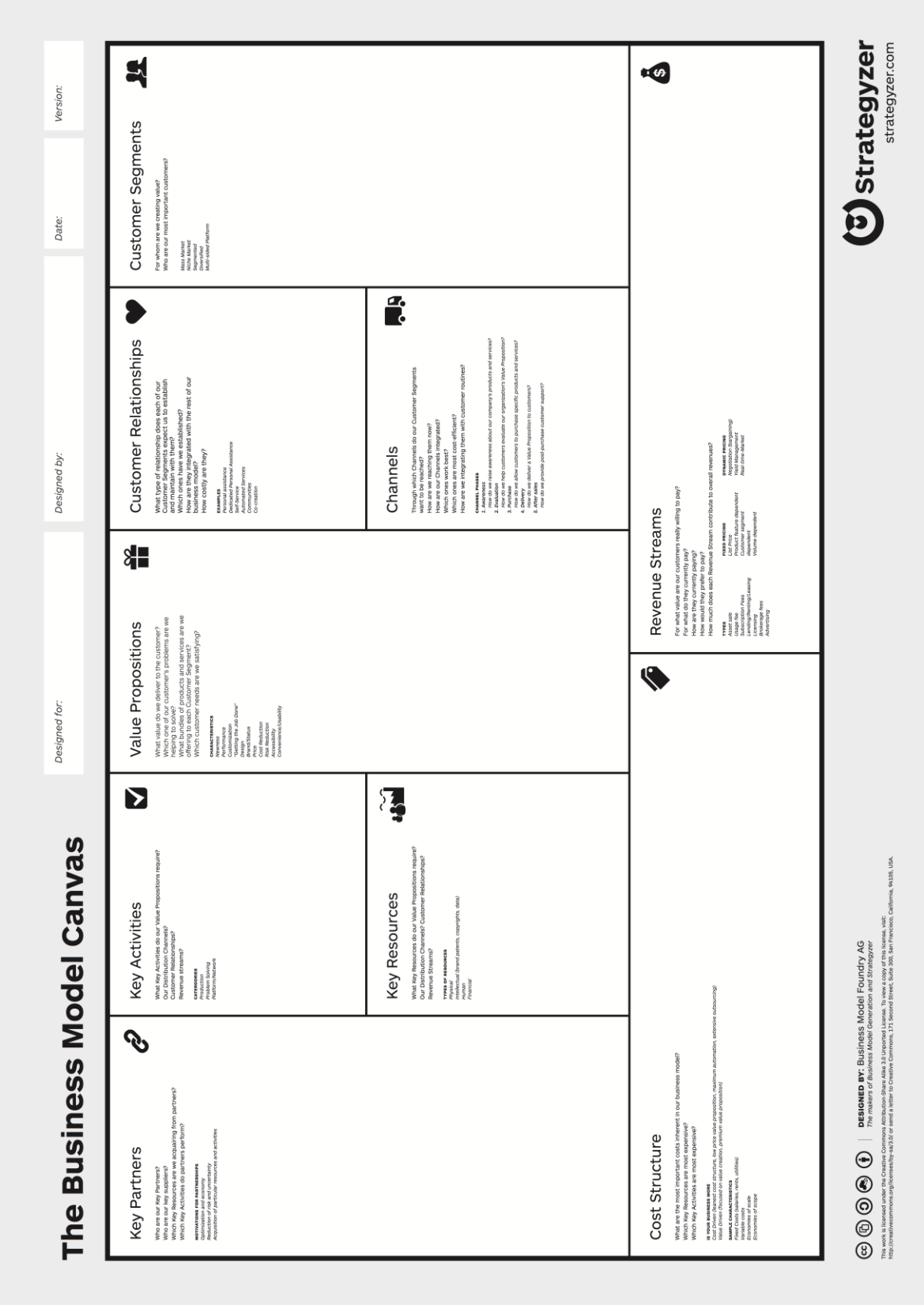
4. Software (including on-line applications) – the software tools, which could support the EV development in city logistics.

5. Scientific papers and presentations – the achievements of the researchers introduced at scientific conferences and/or published in conference proceedings as well as in scientific journals.

Technology Readiness Level of good practice, tool or report
Extract from Part 19 - Commission Decision C (2014) 4995
HORIZON 2020 - Work Programme 2014 - 2015

TRL 1	basic principles observed
TRL 2	technology concept formulated
TRL 3	experimental proof of concept
TRL 4	technology validated in lab
TRL 5	technology validated relevant environment
TRL 6	technology demostrated in relevant environment
TRL 7	system prototype demonstration in operational environment
TRL 8	system completed and qualified
TRL 9	actual system proven in operational environment

Annex 2: Business Model Canvas template



Source: www.strategyzer.com, available on 12.12.2018.

Annex 3: Partner Data collection (Austria, Denmark, Germany, Poland, Turkey)

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report (see also tab "Sources")

a) **Name of the (select one):** ☑ Good Practice ☐ Tool ☐ Report

A1 EMILIA - Electric Mobility for Innovative Freight Logistics in Austria
Parcel Delivery with electric vehicles

b) **Country**

Austria

c) **Current status:** ☐ planned ☐ under preparing ☑ on-going ☑ finished

d) **Duration of the action:** **30** **Month**

e) **Type of action (choose please as many as you need):**

☐ vehicle procurement
☐ fleet mix
☐ vehicle deployment
☐ charging infrastructure
☑ logistics structure
☑ business models

☐ technology of electric vehicles
☑ subsidy, funding, measures
☐ experiences (good practices and use cases)
☐ special tricks and tips

☐ TCO calculators
☐ route optimization considering the charging infrastructure
☐ optimization and planning of charging stations infrastructure
☐ optimization of charging processes and systems

other:

☐
☐

☐

f) **Developed by:**

- ☐ public authorities
- ☐ public-private partnership
- ☐ private sector
- ☐ association
- ☑ research entity
- ☐ other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

Scope was the implementation of an optimization of delivery and collection of parcels to business customers over a predefined time horizon using electric vehicles. The business customers rely on regular delivery times and familiar delivery personnel. Therefore, consistency when visiting customers for delivery and collection is to be maintained, implying that the same person should visit the same customer at approximately the same time every day. In order to enable the sustainable delivery and collection of parcels, electric vehicles are used. Each vehicle has to complete the delivery of parcels before a collection tour of (return) parcels can start. Each tour has a maximum length given by the battery range of the electric vehicles. Between the delivery tour and the collection tour, vehicles visit a specific location, where recharging is possible. Since fast charging slots are a limited resource, scheduling is necessary and delivery and collection tours have to be combined efficiently.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

Set of existing customers that are serviced with common combustion delivery vehicles in urban and rural areas.

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

Development of a set of consistent delivery and collection tours for electric vehicles, optimizing a combination of criteria: minimal travel time, minimal operating time of each vehicle (including waiting time for recharging and recharging time), and maximum loading capacity utilization.

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results

(e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

Possibility to use electric driven delivery vehicles on existing customer services and ensuring the services quality

k) **What were the main success factors**

All existing tours and services based on combustion vehicles could be served with eletric driven delivery veicles in the testing campaign.

l) **Keywords** (please write just three most characteristic keywords for your example)

electric dricven delivery cars
route optimization with predefined time horizons
ensure delivery quality

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

4

n) **Stakeholders (please fill out tab "Stakeholders")**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☐ Technical challenges: **development of an optimization algorithm to include positions of charging stations for electric delivery vehicles and existing customer services (delivery and pick-up)**

☐ Financial challenges:

☐ Politicial challenges:

☐ Partnership challenges:

☐ Other challenges:

3 FINANCES

a) **What was the total cost of the action?** **Euro**

b) **How was the activity financed?**

☐ Own funding ☐ Co-financing (e.g. PPP) ☐ Local/Regional project ☐ National project ☐ EU project

☑ Other: national research funding of lighthouse project in eletromobility

c) **Is there a business model described in the good practice, report or tool?**

if yes, Mr. Allesch will contact you to create an eMobility Canvas Model (please fill in also 4 c)

4 CONTACT DETAILS (if relevant)

a) **Address details**

b) **Link to the web-site (if applicable)**

http://www.emilia-project.at/

c) **only for EUFAL Test: please fill in your name or a shortcut and a phonenumber/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

juergen.zajicek@ait.ac.at

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)	Description	Contact details	Link

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report (see also tab "Sources")

a) **Name of the (select one):** ☐ Good Practice ☑ Tool ☐ Report

A2 VECEPT Fleet Optimization Tool

b) **Country**

Austria

c) **Current status:** ☐ planned ☐ under preparing ☐ on-going ☑ finished

d) **Duration of the action:** **42** **Month**

e) **Type of action (choose please as many as you need):**

- ☑ vehicle procurement
- ☑ fleet mix
- ☑ vehicle deployment
- ☐ charging infrastructure
- ☐ logistics structure
- ☐ business models
- ☐ technology of electric vehicles
- ☐ subsidy, funding, measures
- ☐ experiences (good practices and use cases)
- ☐ special tricks and tips
- ☐ TCO calculators
- ☐ route optimization considering the charging infrastructure
- ☐ optimization and planning of charging stations infrastructure
- ☐ optimization of charging processes and systems

other:

- ☐
- ☐

☐

f) **Developed by:**

☐ public authorities	☐ association
☐ public-private partnership	☑ research entity
☐ private sector	☐ other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

The VECEPT fleet management tool can be applied to determine optimised strategies for the gradual introduction of plug-in hybrid vehicles and battery electric vehicles into existing (conventional) fleets. Incorporating basic data on the existing vehicle fleet and respecting the daily mobility requirements of the users, optimised solutions with respect to cost and CO2 emissions are computed. Fleet optimization relies on information about the fleet's daily operations including the required number and type of cars, the expected number and length of trips, and opportunities to recharge a car's batteries between trips. This information can be extracted from vehicle logbooks and GPS loggers, if available, in order to alleviate the burden on the fleet operator, who would otherwise have to provide this information manually. Summarizing the characteristics of a fleet's daily trips by a manageable number of prototypes, their frequency of occurrence and their variabilities, significantly reduces complexity and makes optimization feasible. Via the generation of scenarios, users can specify their assumptions of future developments, e.g. regarding demand, energy or fuel cost, etc. This feature also allows users to determine requirements for charging infrastructure. An estimation on the number of charging stations can be introduced as scenario input. According to the coverage of charging infrastructure, the proposed fleet composition will vary with respect to the percentage of conventional, electric and plugin-hybrid vehicles. Since the fleet management tool allows users to interact instantaneously, different potential coverage values can be assumed and their effects on the fleet composition can be evaluated.

The fleet management tool graphically presents a set of comparable solutions, enabling users to choose the fleet composition which best fits their preferences for cost and CO2-emissions. For each solution detailled buy- and sell-decisions for vehicles are given over a specified time horizon. The VECEPT fleet management software system aims at supporting decision makers when deciding on their fleet configuration.

The core of the system is an algorithm which generates potentially Pareto-optimal solutions with respect to cost and CO2-emissions. Over a predefined time horizon, e.g. four years, the method determines the vehicles to be bought and sold. Since two objectives are considered, the method does not only generate one optimal solution, but a whole set of potentially Pareto-optimal solutions. Decision makers can then choose the solution which best fits their preferences out of this whole set. This means that no priorities for one or the other objective need to be specified beforehand, but fleet compositions and detailed solutions can be compared visually and in detail.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

The need for novel mobility concepts to address the challenges posed by current and upcoming emission reduction and energy efficiency goals and regulations was articulated by diverse stakeholders (e.g. large retail, public administration, car rental and leasing). The move from personal company cars towards car pools and providing mobility as a service within a company requires a paradigm shift with regards to employee benefits and incentives. It is expected that tax regulations will also undergo changes with regards to overall emission reduction goals and thereby reduce the advantages for employers to use personal company cars as benefits.

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

The strategy change from personally dedicated vehicles to vehicle pooling in commercial fleets will be a major step to reduce environmental effects of commercially initiated mobility and transport.

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results (e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

The first scenario represents a virtual example of a company whose trips mainly occur in the corridor between Vienna and Graz, where the recharging of electricity is only possible in Vienna and Graz. The demand data of this company contains shorter trips starting in Vienna and heading towards Graz, as well as longer trips going from Vienna to Graz and back. The aim of the fleet management software is to optimize the vehicle fleet over a given time horizon (4 years in this example), starting from an initial vehicle fleet. Obviously, if recharging electricity is only possible in Vienna and Graz, a battery range of more than 200km would be required. In the first scenario, the recommended fleet at the end of the time horizon contains three plug-in hybrid vehicles and 6 conventional vehicles. Given the long distance which needs to be traversed until charging is possible, the plug-in hybrid vehicle is very well suited. The second scenario again represents a virtual example of a company whose trips mainly occur in the corridor between Vienna and Graz.

k) **What were the main success factors**

The evaluation of the fleet management software and the proposed solutions consisted of interactive tests with users of the algorithmic toolset. Recommendations proposed by the tool and feedback gathered from the users allowed to evaluate the quality/correctness of the answer proposed. In addition the user-friendliness of the prototype and the fulfillment of basic requirements when interacting with the users were checked.

l) **Keywords** (please write just three most characteristic keywords for your example)

fleet management tool
optimization algorithm
novel mobility concepts

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

TRL 4

n) **Stakeholders (please fill out tab "Stakeholders")**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☐ Technical challenges:

☐ Financial challenges:

☐ Politicial challenges:

☐ Partnership challenges:

☐ Other challenges:

3 FINANCES

a) **What was the total cost of the action?** **610 000** **Euro**

b) **How was the activity financed?**

☐ Own funding ☐ Co-financing (e.g. PPP) ☐ Local/Regional project ☑ National project ☐ EU project

☑ Other: national research funding initiative (flagship project)

c) **Is there a business model described in the good practice, report or tool?**

if yes, Mr. Allesch will contact you to create an eMobility Canvas Model (please fill in also 4 c)

4 CONTACT DETAILS (if relevant)

a) **Address details**

b) **Link to the web-site (if applicable)**

c) **only for EUFAL Test: please fill in your name or a shortcut and a phonenumber/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

juergen.zajicek@ait.ac.at

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)	Description	Contact details	Link
1	**AIT Austrian Institute of Technology**	**RE**		pamela.nolz@ait.ac.at	https://www.ait.ac.at/
2	**Fluidtime**	**BE**	**Software Development**		https://www.fluidtime.com/

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report (see also tab "Sources")

a) **Name of the (select one):** ☑ Good Practice ☐ Tool ☐ Report

D1 Vehicle-To-Equipment (V2E)

b) **Country**

Denmark

c) **Current status:** ☐ planned ☐ under preparing ☐ on-going ☑ finished

d) **Duration of the action:** **12** **Month**

e) **Type of action (choose please as many as you need):**

- ☑ vehicle procurement
- ☐ fleet mix
- ☐ vehicle deployment
- ☐ charging infrastructure
- ☐ logistics structure
- ☐ business models

- ☑ technology of electric vehicles
- ☐ subsidy, funding, measures
- ☐ experiences (good practices and use cases)
- ☐ special tricks and tips

- ☑ TCO calculators
- ☐ route optimization considering the charging infrastructure
- ☐ optimization and planning of charging stations infrastructure
- ☐ optimization of charging processes and systems

other:

- ☐
- ☐

☐

f) **Developed by:**

- ☑ public authorities
- ☑ public-private partnership
- ☐ private sector
- ☐ association
- ☐ research entity
- ☐ other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

The V2E pilot project is based on AFA JCDecaux and their experiences with seven electrical vans with a V2E application. AFA JCDecaux is the company who is responsible for the operation and maintenance of bus shelters and advertising boards in Copenhagen. The electrical vans are used in AFA JCDecaux daily job as part of their contract with the municipality of Copenhagen.This study is based on their experiences with the seven electric vans with an V2E application partly funded by Electric Copenhagen and the Danish Energy Agency.The purpose of the V2E project is to evaluate the potential of exploiting and expanding the V2E technology, to examine the economic aspects in the concept, and finally to assess potential areas of use.The V2E technology has not been connected to the electric circuit and the main battery of the car in a commercial solution. A solution with a 1 kWh LPS (Lithium Power Supply) battery box in the back of the van has therefore been applied as a source to power the tools used by AFA JCDecaux in their service of the bus shelters and advertising boards.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

The electricity provided to working tools in combination with service and construction tasks is primary based on petrol or diesel generators. This contributes to negative externalities such as CO2, Nox and more noice. An alternative would be to use the V2E technology to provide power to the tools.

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

The main motivation of the project was to adress the barriers and potential of extending the usage of the V2E technology. The analays focused on:
• Opportunities to utilize electric car battery capacity to supply power for tools and equipment.
• New potential applications for V2E
• Economic incentives and aspects of replacing vans with electric cars.
• Socio-economic consequences in the form of saved emissions.
• Requirements made by public authorities in temrs of procurement of green transport

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results (e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

The financial aspects of replacing vans with the electric alternative is quantified based on comprehensive TCO calculations. The results show that the costs after six years of operation are virtually identical for the electric and diesel vans. If scrap values of the car and the battery box are included, the electric alternative is most profitable. A successful implementation of V2E was documented in the project. After using them for six months, the employees of AFA JCDecaux were pleased with the electric vans suited for city driving, along with the 1 kWh LPS battery box which turned out to be more than sufficient as power supply and with an impeccable performance during the test period. This study also concludes that electric vans can easily be adapted to other service and maintenance purposes inside the city, such as tasks at parks and roads, gardening, window shading and other minor handwork tasks.The project has found significant saving potential for environment, climate and private economy in the V2E technology. Significant environmental and

k) **What were the main success factors**

the economical support to procure vehicles and techological equioment, and also to use consultants for doing the analysis. Good communication

l) **Keywords** (please write just three most characteristic keywords for your example)

Electrical vans
V2E
Service
Construction
TCO

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

TRL 7

n) **Stakeholders (please fill out tab "Stakeholders")**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☐ Technical challenges:

☐ Financial challenges:

☐ Politicial challenges:

☐ Partnership challenges:

☑ Other challenges: **The determining factor for further dissemination of V2E technologies and electrical vehicles is that there is a demand from costumers - of which the public purchases constitutes a**

3 FINANCES

a) **What was the total cost of the action?** **300 000** **Euro**

b) **How was the activity financed?**

☐ Own funding ☐ Co-financing (e.g. PPP) ☐ Local/Regional project ☐ National project ☐ EU project

☑ Other: Funded by the Danish Energy Agency

c) **Is there a business model described in the good practice, report or tool?**

yes

if yes, Mr. Allesch will contact you to create an eMobility Canvas Model (please fill in also 4 c)

4 CONTACT DETAILS (if relevant)

a) **Address details**

b) **Link to the web-site (if applicable)**

n/a

c) **only for EUFAL Test: please fill in your name or a shortcut and a phonenumber/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

Angelica Rennerfelt, CPH-E, angelica.rennerfelt@regionh.dk

Involved stakeholders

No	**Name**	**Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)**	**Description**	Contact details	**Link**

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report (see also tab "Sources")

a) **Name of the (select one):** ☑ Good Practice ☐ Tool ☐ Report

D2 GreenMile

b) **Country**

Denmark

c) **Current status:** ☐ planned ☑ under preparing ☐ on-going ☐ finished

d) **Duration of the action:** **N/A** **Month**

e) **Type of action (choose please as many as you need):**

- ☑ vehicle procurement
- ☐ fleet mix
- ☐ vehicle deployment
- ☐ charging infrastructure
- ☑ logistics structure
- ☑ business models
- ☐ technology of electric vehicles
- ☑ subsidy, funding, measures
- ☐ experiences (good practices and use cases)
- ☐ special tricks and tips
- ☐ TCO calculators
- ☐ route optimization considering the charging infrastructure
- ☐ optimization and planning of charging stations infrastructure
- ☐ optimization of charging processes and systems

other:

- ☑ **e-logistics**
- ☐

☐

f) **Developed by:**

- ☐ public authorities
- ☑ public-private partnership
- ☐ private sector
- ☐ association
- ☐ research entity
- ☐ other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

Today, goods are being shipped in petrol and diesel cars, resulting in reduced air quality and noise levels. In addition, the amount of goods shipped to Copenhagen is growing, giving more lorries on the streets of the city. Therefore, Copenhagen Electric (Unit of The Capital Region of Denmark) started a dialogue with transport and logistics companies in region. In that dialogue, it has been identified that there is a great potential for a green transition by, for instance, introducing alternative fuel vehicles. Copenhagen Electric also had a dialogue with the European Investment Bank, who would like to support the transport and logistic companies in this tranformaiton by introducing an investment program. Based on the great potential and financial support of the European Investment Bank, Copenhagen Electric has initiated a partnershoip with the Dansih Chamber of Commerce to take action as freight transport contributes to increased noise, congestion and reduced air quality. Thw Chamber of Commerce has a good dialogue with the freight industry and can gather many companies that are willing to participate in an investment program. This private-public partnership, will gather the freight industry to emphasize the importance of creating efficient freight transport and to ensure that the fleet of petrol and diesel cars is replaced by clean vehicles.Through the ELENA support program, the European Investment Bank provides funds for preparing investment programs that supports the green change of freight transport in European cities.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

The Capital Region of Denmark want's to be seen as a green metropol of transport.The challenges that the region are facing also affects the transport and logistics companiesand how they will run their business in the region. They are pushed to create efficient and sustainable urban freight and logistics solutions by for instance replacing their the petrol and diesel vehicles to clean vehicles running on alternative fuels such as electricity and biofuel. However this transformation requires major investements for an highly competitive industry. And for companies that don't have these resources, they risk to be outcompeted. This project focus on presenting an investment program to speed up and support this green transformation of transport and logistics companies.

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

The purpose of this project is to speed up the sustainable transition the transport and the logsitics companies are facing due to the challenges that are faced. By presenting an investment program, companies would get financial support to and start to investigate how to achieve green business models in terms of sustainable urban freight and logsitcs.

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results (e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

N/A as the project is in its start up phase.

k) **What were the main success factors**

N/A

l) **Keywords** (please write just three most characteristic keywords for your example)

sustainable urban freight and logistics
funding program
public-private partnership
transport and logistics
last mile delivery

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

1

n) **Stakeholders (please fill out tab "Stakeholders")**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☐ Technical challenges:

☐ Financial challenges:

☐ Politicial challenges:

☐ Partnership challenges:

☐ Other challenges:

3 FINANCES

a) **What was the total cost of the action?** **Euro**

b) **How was the activity financed?**

☐ Own funding ☐ Co-financing (e.g. PPP) ☐ Local/Regional project ☐ National project ☐ EU project

☑ Other: Funding program by European Investment Bank

c) **Is there a business model described in the good practice, report or tool?**

if yes, Mr. Allesch will contact you to create an eMobility Canvas Model (please fill in also 4 c)

4 CONTACT DETAILS (if relevant)

a) **Address details**

b) **Link to the web-site (if applicable)**

c) **only for EUFAL Test: please fill in your name or a shortcut and a phonenumber/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

Angelica Rennerfelt Copenhagen Electric angelica.rennerfelt@regionh.dk

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)	Description	Contact details	Link

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report (see also tab "Sources")

a) **Name of the (select one):** ☐ Good Practice ☑ Tool ☐ Report

D3 Fleet deployment and route optimization for the delivery of blood samples using EVs

b) **Country**

Denmark

c) **Current status:** ☐ planned ☑ under preparing ☐ on-going ☐ finished

d) **Duration of the action:** **ca. 23** **Month**

e) **Type of action (choose please as many as you need):**

☐ vehicle procurement
☐ fleet mix
☐ vehicle deployment
☐ charging infrastructure
☐ logistics structure
☐ business models

☐ technology of electric vehicles
☐ subsidy, funding, measures
☐ experiences (good practices and use cases)
☐ special tricks and tips

☐ TCO calculators
☐ route optimization considering the charging infrastructure
☐ optimization and planning of charging stations infrastructure
☐ optimization of charging processes and systems

other:

☑ **Route and fleet optimization with battery considerations**
☑ **Research: solution methods**

f) **Developed by:**

- [x] public authorities
- [ ] association
- [ ] public-private partnership
- [x] research entity
- [ ] private sector
- [ ] other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

The Capital Region of Copenhagen holds a pure EV fleet for the delivery of blood samples between the family physicians and hospitals and the centralised laboratories. The collection and delivery planning are currently based on fixed routes that do not exploit the fluctuations of the demand. An automated planning tool is being developed to create a more dynamic routing that can better utilize the fleet capacity. Standard route optimisation software cannot be utilized as it is crucial to include battery consumption and the deterioration of the blood samples in the tool.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

Using fixed routes for the blood sample collection has shows to underutilize the current EV-fleet. Given that the fleet is composed of different size vehicles, with different battery ranges, a more dynamic fleet deployment and routing should be able to better map to the demand and thus better utilize the fleet.

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

To design, implement and test an optimized EV-fleet routing software that can be integrated into the current vehicle dispatch system.

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results
(e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

Aside from optimized routing, the tool can be used to evaluate what-if scenarios for where different fleet compositions are tested. A better utilization of the fleet will translate in a reduction of vehicles in the urban centres, and reduce the amount of energy need by the fleet. the current vehicle dispatch system.

k) **What were the main success factors**

Scientific staff, collaboration with the Capital Region of Denmark, offered funding, an existing EV fleet and the readiness of the data.

l) **Keywords** (please write just three most characteristic keywords for your example)

EV based route optimization
On-site implementation
Heterogeneaus fleet: e-bikes, e-scooters, e-vans

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

TRL9

n) **Stakeholders (please fill out tab "Stakeholders")**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☐ Technical challenges:

☐ Financial challenges:

☐ Politicial challenges:

☐ Partnership challenges:

☐ Other challenges:

3 FINANCES

a) **What was the total cost of the action?** **ca. 150.000** **Euro**

b) **How was the activity financed?**

☐ Own funding ☐ Co-financing (e.g. PPP) ☐ Local/Regional project ☑ National project ☑ EU project

☑ Other: Part of the EUFAL project - Electromobility Europe

c) **Is there a business model described in the good practice, report or tool?**

no

if yes, Mr. Allesch will contact you to create an eMobility Canvas Model (please fill in also 4 c)

4 CONTACT DETAILS (if relevant)

a) **Address details**

b) **Link to the web-site (if applicable)**

c) **only for EUFAL Test: please fill in your name or a shortcut and a phonenumber/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

Dario Pacino, DTU

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)	Description	Contact details	Link
	Technical Univeristy of Denmark	**RE**	**Responsible for the technological development**	Dario Pacino, darpa@dtu.dk	
	Capital Region of Denmark	**PA**	**Logistics department**		
	Copenhagen Electric	**PA**	**Facilitator**	Mette Hoe, mette.hoe@regionh.dk	

SELECT
Suitable ELEctromobility
for Commercial Transport

The commercial transport sector is of particular relevance for the overall transport system and its climate impact. It is assumed to be one of the early adopters of electromobility. In order to increase market penetration, SELECT will provide deeper knowledge on commercial transport with respect to the potential for electromobility. Besides usage patterns and related technological and organisa-tional requirements, special emphasis will be given to expectations, attitudes, and preferences to-wards the adoption of electromobility, in particular for specific economic sectors. As research will consider the actual state and expected development in different European countries, national simi-larities or differences will be taken into account. Survey data to be collected during the project will provide the empirical background for in-depth analysis. Respective findings will be used twofold: First, a methodological framework will be devel-oped that builds the basis for further industrial development of tools and services that address new opportunities and challenges when utilising EV within commercial fleets. Second, recommenda-tions will be derived addressing the broad range of stakeholders including policy, industry, and us-ers. Recommendations will consider not only technological solutions, but also economic, political and infrastructural environments notably supporting the customer's shift from conventional to elec-tric vehicles. Stakeholders such as logistics operators, industry, academia, and policy will be consulted through-out the project to benefit not only from their particular perspective and in-depth knowledge, but also to address and meet their interest. Within the SELECT consortium research institutions will work together with business companies that already have integrated electric vehicles into their fleets or are going to develop supporting services.

1. Description of Good Practice, Tool or Report (see also tab "Sources")

a) **Name of the (select one):** ☐ Good Practice ☑ Tool ☐ Report

D4 SELECT: Suitable ELEctromobility for Commercial Transport

b) **Country**

Denmark

c) **Current status:** ☐ planned ☐ under preparing ☐ on-going ☑ finished

d) **Duration of the action:** **36** **Month**

e) **Type of action (choose please as many as you need):**

☑ vehicle procurement
☐ fleet mix
☑ vehicle deployment
☐ charging infrastructure
☐ logistics structure
☐ business models

- [ ] technology of electric vehicles
- [x] subsidy, funding, measures
- [x] experiences (good practices and use cases)
- [ ] special tricks and tips

- [ ] TCO calculators
- [ ] route optimization considering the charging infrastructure
- [ ] optimization and planning of charging stations infrastructure
- [ ] optimization of charging processes and systems

other:

- [ ]
- [ ]
- [ ]

f) **Developed by:**

- [x] public authorities
- [ ] public-private partnership
- [ ] private sector
- [ ] association
- [x] research entity
- [ ] other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

The Danish part of SELECT contributed to describe the commercial transport sector and to the analysis of potential use of electric transport; lead the task of focusing on developing a stated preference questionnaire aiming at vehicle purchase decision makers; cooperating in terms of designing and undertaking GPS-based vehicle tracking in selected commercial vehicle fleets; assistance in in-depth analysis of specific selected branches; contribution to implementation strategies. Skills to be contributed included extensive experience in data collection by GPS data tracking and by web based surveys and Stated Preference methodologies; experience in econometric modelling of market potentials; and participation in several parallel projects in electromobility that gives an outstanding
overview of methodologies and experiences from whole Europe.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

Most of the focus on the use of passenger EV and little is know regarding the use of EV for commercial transportation, i.e. the transportation of goods as well as the transportation of people for commercial purposes.

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

SELECT examines the actual state and expected development of EV in commercial transport in different European countries and derives recommendations addressing the broad range of stakeholders including policy, industry, and users. Different solutions to support the customers' shift from conventional to electric vehicles was proposed.

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results (e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

Development of a European research focus for transport optimisation in the electromobility research area. The project uptakes existing research results and technological developments of ongoing research projects and create new knowledge on usage patterns, user needs, expectations and willingness-to-pay towards vehicle design and services, and analyse expected changes in mobility behaviour due to the introduction and use of electric vehicles.

k) **What were the main success factors**

The developed innovative methodological framework focusing on special requirements of EV and mixed commercial fleets to be a service-oriented key enabler: applying suitable technological components for fleet management to commercial transport that enables a wide range of organisations in complex functional systems like CEP, social care organisations, or (company) vehicle fleet operators to achieve quality enhancement and cost-optimisation, thereby benefiting companies and the roll-out of electromobility to achieve the European 2050-Goals.

l) **Keywords** (please write just three most characteristic keywords for your example)

EV procurement
Commercial transport
Implementation rates

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

TRL7

n) **Stakeholders (please fill out tab "Stakeholders")**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

- ☐ Technical challenges:
- ☐ Financial challenges:
- ☐ Politicial challenges:
- ☐ Partnership challenges:
- ☑ Other challenges: **Original contact person has left DTU and the information for this section is not available.**

3 FINANCES

a) **What was the total cost of the action?** **ca. 460.000** **Euro**

b) **How was the activity financed?**

☐ Own funding ☐ Co-financing (e.g. PPP) ☐ Local/Regional project ☑ National project ☑ EU project

☐ Other:

c) **Is there a business model described in the good practice, report or tool?**

no

if yes, Mr. Allesch will contact you to create an eMobility Canvas Model (please fill in also 4 c)

4 CONTACT DETAILS (if relevant)

a) **Address details**

b) **Link to the web-site (if applicable)**

c) **only for EUFAL Test: please fill in your name or a shortcut and a phonenumber/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)	Description	Contact details	Link
	Technical Univeristy of Denmark	**RE**	**Responsible for the technological development**	Sigal Kaplan, siga@dtu.dk	
	Sixt	**BE**	**Car rental**		
	Dansk Elbils alliance	**A**	**Electric transport interest organisation**		
	Danish Energy Association	**BE**	**Business interest organisation**		
	Municipality of Copenhagen	**PA**	**Public authority actively engaged in electromobility**		

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report (see also tab "Sources")

a) **Name of the (select one):** ☐ Good Practice ☑ Tool ☐ Report

D5 MTH Analysis of mix fleet composition for technicians routing

b) **Country**

Denmark

c) **Current status:** ☐ planned ☐ under preparing ☑ on-going ☐ finished

d) **Duration of the action:** **ca. 23** **Month**

e) **Type of action (choose please as many as you need):**

- ☐ vehicle procurement
- ☑ fleet mix
- ☑ vehicle deployment
- ☐ charging infrastructure
- ☐ logistics structure
- ☐ business models
- ☐ technology of electric vehicles
- ☐ subsidy, funding, measures
- ☐ experiences (good practices and use cases)
- ☐ special tricks and tips
- ☐ TCO calculators
- ☐ route optimization considering the charging infrastructure
- ☐ optimization and planning of charging stations infrastructure
- ☐ optimization of charging processes and systems

other:

- ☐
- ☐

f) **Developed by:**

- [ ] public authorities
- [ ] public-private partnership
- [x] private sector
- [ ] association
- [x] research entity
- [ ] other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

MT Højgaard (MTH) is one of the leading construction and civil engineering companies in the Nordic countries. Currently holding a large fleet of ICTs, MTH wishes to have a greener profile and is interested in the inclusion of Evs. The project aims at developing a decision support tool that can be used to identify the ideal ratio between ICT and EV deployments. In order such such an analysis to be performed, large quantities of historical data and models of battery consumpion are essential. To evaluate the accuracy of the battery consumption model, a demonstration will run where the job assingments of the model will be tested in real-life using EVs.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

The project will run focused on a portion of MTH business, the routing of technicians to the different building and maintenance sites. The havy load of equipment and spare parts has a negative impact on the driving range of the Evs. Advanced energy consumprion models and their calibration is thus needed to identify where and how EVs can be incorporated into the current ICT fleet.

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

To design, implement a decision support tool that can help identify an optimised ICT/EV ratio in a fleet of vehicles with heavy cargo loads.

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results
(e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

The tool will help identify applicable introductions of EV vehicles in fleets where skepticisms is encountered due to limitations on the EV driving range. Easing the decision process will promote an easied transition towards more green operations.

k) **What were the main success factors**

Scientific staff, collaboration with MT Højgaard, offered funding, the readiness of the data and the willingness to test the model in real-life.

l) **Keywords** (please write just three most characteristic keywords for your example)

Optimisation based decision support
On-site EV implementation
Mixed havey-duty ICT/EV fleet

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

TRL7

n) **Stakeholders (please fill out tab "Stakeholders")**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☐ Technical challenges:

☐ Financial challenges:

☐ Politicial challenges:

☐ Partnership challenges:

☐ Other challenges:

3 FINANCES

a) **What was the total cost of the action?** **ca. 150.000** **Euro**

b) **How was the activity financed?**

☐ Own funding ☐ Co-financing (e.g. PPP) ☐ Local/Regional project ☑ National project ☑ EU project

☑ Other: Part of the EUFAL project - Electromobility Europe

c) **Is there a business model described in the good practice, report or tool?**

no

if yes, Mr. Allesch will contact you to create an eMobility Canvas Model (please fill in also 4 c)

4 CONTACT DETAILS (if relevant)

a) **Address details**

b) **Link to the web-site (if applicable)**

c) **only for EUFAL Test: please fill in your name or a shortcut and a phonenumber/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

Dario Pacino, DTU

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)	Description	Contact details	Link
	Technical Univeristy of Denmark	**RE**	**Responsible for the technological development**	Dario Pacino, darpa@dtu.dk	
	MT Højgaard	**BE**	**Fleet manager**		
	Copenhagen Electric	**PA**	**Facilitator**	Angelica Rennerfelt <angelica.rennerfelt@regionh.dk>	

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report (see also tab "Sources")

a) **Name of the (select one):** ☐ Good Practice ☐ Tool ☐ Report

D6 Citylogistics CPH -consolidated City logistics in Copenhagen

b) **Country**

Denmark

c) **Current status:** ☐ planned ☐ under preparing ☐ on-going ☑ finished

d) **Duration of the action:** **24** **Month**

e) **Type of action (choose please as many as you need):**

☐ vehicle procurement
☐ fleet mix
☐ vehicle deployment
☐ charging infrastructure
☑ logistics structure
☑ business models

☑ technology of electric vehicles
☑ subsidy, funding, measures
☑ experiences (good practices and use cases)
☐ special tricks and tips

☐ TCO calculators
☐ route optimization considering the charging infrastructure
☐ optimization and planning of charging stations infrastructure
☐ optimization of charging processes and systems

other:

☐
☐

☐

f) **Developed by:**

- ☑ public authorities
- ☐ public-private partnership
- ☑ private sector
- ☐ association
- ☑ research entity
- ☐ other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

Citylogistik KBH was a demonstration project funded by the "Center for Green Transport" initiative by the Danish Transport Authority. The "Center for Green Transport" co-funded a wide range of demonstration project in the time period 2011-2017 as part of the so-called "Green Transport Agreement" passed by the Danish parliament in 2009.The project fell into two phases; the first phase started in 2011 and dealt with the development of the concept for citylogistics in Copenhagen whereas the second phase was a pilotproject in which a small 2-person company were given some subsidies to start implementing a battery electric driven vehicle to deliver goods in the inner part of Copenhagen (the medieval part of the city) to retailers.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

The project aimed at developing a financially sustainble citylogistics service which was able to contribution to reducing the eternal effects of freight transport in the inner part of Copenhagen. This also supported the vision of the Municipality of Copenhagen in meeting its goal in becoming a CO2-neutral in 2030.

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

To support the goal of becoming a CO2-neutral city while maintaining a liveable inner part of the city with good conditions for the business owners

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results (e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

The analyses made by the Technical University of Denmark and the Copenhagen Business School estimated that a succesful implementation of a citylogistics service would entail that btw. 30.000 and 50.000 drops could be eliminated every year. A drop is defined as each time a delivery vehicle stops in front of a shop and delivers at least one package/box/pallet. "A succesful implementation" was defined as a financially sustainable citylogistics service which was estimated to have at least 120 retailers subscribe to the service.

k) **What were the main success factors**

To reach the financially sustainable citylogistics service with at least 120 retailers subscribing to the service and to eliminate the estimated 30.000-50.000 drops per year leading to less noise, lower CO2-emissions, less congestion due to the higher fillrates on the consolidated citylogistics truck(s)

l) **Keywords** (please write just three most characteristic keywords for your example)

Citylogistics
Consolidated transport
Battery electric freight delivery vehicle

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

TRL 9

n) **Stakeholders (please fill out tab "Stakeholders")**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☐ Technical challenges:

☑ Financial challenges:

	To reach the desired volume in terms of subscribing retailers
☑ Politicial challenges:	**To be allowed by the authorities to give priority to the city logistics service rather than the usual suspects such as DHL, UPS, etc.**
☐ Partnership challenges:	
☐ Other challenges:	

3 FINANCES

a) **What was the total cost of the action?** **Approx. 1 mio. Euro** **Euro**

b) **How was the activity financed?**

☐ Own funding ☐ Co-financing (e.g. PPP) ☐ Local/Regional project ☑ National project ☐ EU project

☐ Other:

c) **Is there a business model described in the good practice, report or tool?**

Yes, the business model is almost a true copy of the Dutch Binnenstad citylogistics service

if yes, Mr. Allesch will contact you to create an eMobility Canvas Model (please fill in also 4 c)

4 CONTACT DETAILS (if relevant)

a) **Address details**

b) **Link to the web-site (if applicable)**

c) **only for EUFAL Test: please fill in your name or a shortcut and a phonenumber/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)	Description	Contact details	Link
1	**Citylogistics KBH**	**BE**	**The operator delivering the goods to the retailers in the city centre**	Casper Svensson	
2	**Copenhagen Business School**	**RE**	**The formal project manager and developer of the business model**	Professor Britta Gammelgaard, CBS	
3	**Technical University of Denmark**	**RE**	**The development of a scheduling and routing tool for the operator**	Professor Allan Larsen, DTU	
4	**Municipality of Copenhagen**	**PA**	**The municipality**	Tanja Provstgaard Balhorn	

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report (see also tab "Sources")

a) **Name of the (select one):** ☑ Good Practice ☐ Tool ☐ Report

G1 StreetScooter: customer oriented design and production of a light EV-Van for postal and parcel service in cities

b) **Country**

Germany

c) **Current status:** ☐ planned ☐ under preparing ☑ on-going ☐ finished

d) **Duration of the action:** **ca. 100** **Month**

e) **Type of action (choose please as many as you need):**

- ☑ vehicle procurement
- ☐ fleet mix
- ☐ vehicle deployment
- ☐ charging infrastructure
- ☐ logistics structure
- ☐ business models

- ☑ technology of electric vehicles
- ☐ subsidy, funding, measures
- ☑ experiences (good practices and use cases)
- ☑ special tricks and tips

- ☐ TCO calculators
- ☐ route optimization considering the charging infrastructure
- ☐ optimization and planning of charging stations infrastructure
- ☐ optimization of charging processes and systems

other:

- ☑ **custom oriented design of EV**
- ☑ **Research - Customer Interaction**

☐

f) **Developed by:**

- ☐ public authorities
- ☑ public-private partnership
- ☐ private sector
- ☐ association
- ☑ research entity
- ☐ other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

RWTH Technical university Aachen is famous for automobil design, construction and production. A group of professors started in 2010 to develop a pure EV in different sizes and for people and goods transport in cities. Parallel they developed a ramp-up factory for electric vehicles for city transport of people and goods (parcels). Focus was on design and production with the use of modern materials and low cost construction.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

Good timing: the EV prototype was working and exact at this time the potential customer Deutsche Post DHL Group approched the scientific team in search for a EV for city logistics. This lead to a succesful matching of the laboratory team of University and a big customer with a fleet of ca. 30.000 cars for City transport and logistics. A further succes point was the fact, that the university team beide the EV was also capable to design and operate the production facilities.

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

To develope, construct and produce a pure EV from the very beginning. To introduce a complete new method to design, construct and produce EVs.

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results (e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

Implementation of complete electromobility oriented design, EV is by design a working machine and ergonomic designed, load compartment ergonomical and flexible. Powerful mother company, range is flexible according to capacity of battery modules. In few years all transport vehicles of Deutsche Post DHL group will be EVs.

k) **What were the main success factors**

entrepreneurial University, entrepreneurial scientist, staff and students, Regional government offered subsidies and investments. Logistic market leader as customer with an environment oriented mind and strategy. Deutsche Post DHL group used EV as competetive advantage. StreetScooter GmbH has a family of EVs in development and will sell this to all kind of logistic and business customers.

l) **Keywords** (please write just three most characteristic keywords for your example)

EV oriented construction
Customer oriented design
Full competence in electromobility

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

TRL 9

n) **Stakeholders (please fill out tab "Stakeholders")**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☑ Technical challenges: **competence in elektromobility, team work of professors, staff and students**

☑ Financial challenges: **University offered staff, professors, laboratories, premises and**

research money. Regional government gave subsidies, premises for industrial change and future oriented jobs. Shareholder is 100% Deutsche Post DHL Group.

☑ Politicial challenges: **regional goverment was very proactive because of Opel crisis in the region of North Rhine Westfalia**

☑ Partnership challenges: **Close partnership University - Streetscooter.**

☑ Other challenges: **the EVs of the Streetscooter family is sold on a broad basis to logistic companies, handicraft companies with a focus on city transport.**

3 FINANCES

a) **What was the total cost of the action?** **since 2010 est. 30-50 Mio** **Euro**

b) **How was the activity financed?**

☐ Own funding ☑ Co-financing (e.g. PPP) ☐ Local/Regional project ☑ National project ☐ EU project

☑ Other: Deutsche Post DHL Gruppe

c) **Is there a business model described in the good practice, report or tool?**

in development

if yes, Mr. Allesch will contact you to create an eMobility Canvas Model (please fill in also 4 c)

4 CONTACT DETAILS (if relevant)

a) **Address details**

StreetScooter GmbH, Jülicher Straße 191, 52070 Aachen, Telefon: +49 (0)241 9900 23-0, Telefax: +49 (0)241 9900 23-26

b) **Link to the web-site (if applicable)**

www.streetscooter.eu

c) **only for EUFAL Test: please fill in your name or a shortcut and a phone number/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

JAll

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)	Description	Contact details	Link
1	**StreetScooter GmbH**	**BE**	**100% Company of Deutsche Post DHL Group**		www.streetscooter.eu
2	**Deutsche Post DHL Group**	**BE**	**Dr. Jürgen Gerdes, Chairman**		www.dpdhl.com
3	**Prof. Dr.-Ing. Achim Kampker**	**RE**	**Inventor, founder and CEO of Streetscooter GmbH**		**http://www.pem.rwth-aachen.de/cms/PEM/Der-Lehrstuhl/Lehrstuhlleitung/~fkex/Prof-Dr-Ing-Achim-Kampker/?allou=1**

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report (see also tab "Sources")

a) **Name of the (select one):** ☐ Good Practice ☑ Tool ☐ Report

G2 GraphHopper Directions API for route optimization

b) **Country**

Germany

c) **Current status:** ☐ planned ☐ under preparing ☐ on-going ☑ finished

d) **Duration of the action:** **undefined** **Month**

e) **Type of action (choose please as many as you need):**

- ☐ vehicle procurement
- ☑ fleet mix
- ☐ vehicle deployment
- ☐ charging infrastructure
- ☐ logistics structure
- ☐ business models

- ☑ technology of electric vehicles
- ☐ subsidy, funding, measures
- ☐ experiences (good practices and use cases)
- ☑ special tricks and tips

- ☐ TCO calculators
- ☑ route optimization considering the charging infrastructure
- ☐ optimization and planning of charging stations infrastructure
- ☐ optimization of charging processes and systems

other:

- ☑ **Tour optimization tool**
- ☑ **Solving vehicle routing problems**

☐

f) **Developed by:**

☐ public authorities	☐ association
☐ public-private partnership	☐ research entity
☑ private sector	☐ other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

GraphHopper Directions API is toolkit for routing planning and navigation as well as route optimization and geocoding.

With the route optimization software, traveling salesman problems (TSP) and other vehicle routing problems (VRP) can be solved. The user can route a fleet of vehicles (or workers) to deliver items or services to their customers. The route optimization can be integrated into the user's application. It assigns routes to vehicles so that total transportation costs are minimized, and it can consider an arbitrary number of business-specific side constraints like time windows, driver skills and vehicle capacities.

It is lightweight, flexible and easy-to-use, and based on a single all-purpose meta-heuristic currently solving

- *Capacitated VRP*
- *Multiple Depot VRP*
- *VRP with Time Windows*
- *VRP with Backhauls*
- *VRP with Pickups and Deliveries*
- *VRP with Heterogeneous Fleet*
- *Time-dependent VRP*
- *Traveling Salesman Problem*
- *Dial-a-Ride Problem*
- *Various combination of these types*

Setting up the problem, defining additional constraints, modifying the algorithms and visualising the discovered solutions is as easy and handy as reading classical VRP instances to benchmark your algorithm.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

Logistics and transport service providers have to handle vehicle routing problems in their daily business to distribute products and people. In State of the Art, a lot of algorithms already exist to solve these problems. However, there are only very few implementations focussing on tour and fleet composition optimization. Large transport companies have their own tour optimization tools. For small and medium-sized enterprises the solutions of GraphHopper Directions API can be acquired online for a low price. The advantage is that the enterprises save development costs for routing optimization software. GraphHopper Directions API is suitable for operational and strategic planning processes for logistics and transport service providers.

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

The objective of the development of GraphHopper Directions API was to build up a tool that is capable to solve different VRP where the user has full control on the input data, the process, as well as the output data.

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results (e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

GraphHopper Directions API is a tool for VRP, is available online and can be acquired cost-effective. The users are mainly logistics and transport service providers which integrate the software.

The route optimization software can be integrated into the user's application. It assigns routes to vehicles so that the transportation costs are minimized, and it can consider an arbitrary number of business-specific side constraints.

The client can use this tool for route and tour planning processes.

k) **What were the main success factors**

First, the tour and route optimization tool jsprit was developed by Schröder et al. (2012) in the framework of a research project, funded by the German Research Association (DFG).

The development and documentation of jsprit and its related algorithms is open source. Ongoing development and improvement is guaranteed by an existing research community. The developers

l) **Keywords** (please write just three most characteristic keywords for your example)

Vehicle Routing Problems (VRP)
Routing and tour optimization

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

TRL 9

n) **Stakeholders (please fill out tab "Stakeholders")**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☐ Technical challenges:

☑ Financial challenges: Standard Vehicle Routing Problems (VRP) tools are expensive in use

and not flexible for customer problems.

☐ Politicial challenges:

☐ Partnership challenges:

☑ Other challenges: Standard VRP tools are not flexible enough to allow integration into customers environment, unclear optimization algorithms prevent users from understanding process of optimization

3 FINANCES

a) **What was the total cost of the action?** no information available **Euro**

b) **How was the activity financed?**

☑ Own funding ☐ Co-financing (e.g. PPP) ☐ Local/Regional project ☐ National project ☐ EU project

☑ Other: research project

c) **Is there a business model described in the good practice, report or tool?**

in development

if yes, Mr. Allesch will contact you to create an eMobility Canvas Model (please fill in also 4 c)

4 CONTACT DETAILS (if relevant)

a) **Address details**

Geschäftsführer: Stefan Schröder, Peter Karich, Michael Zilske
Telefon: +49 89 2500 771 90
Forum: discuss.graphhopper.com Email: support@graphhopper.com
Lindenschmitstr. 52, 81373 München, Germany

b) **Link to the web-site (if applicable)**

https://www.graphhopper.com/

c) **only for EUFAL Test: please fill in your name or a shortcut and a phone number/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

DLR-JK

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)	Description	Contact details	Link
1	**GraphHopper GmbH**	**BE**	**Software developer**	Geschäftsführer: Stefan Schröder, Peter Karich, Michael Zilske Telefon: +49 89 2500 771 90 Forum: discuss.graphhopper .com Email: support@graphhopp er.com Lindenschmitstr. 52 81373 München, Germany	https://www.graphhopper.com/
2	**Users**	**BE**	**Companies with commercial fleets willing to optizime their fleets and vehicle routing**		

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report (see also tab "Sources")

a) **Name of the (select one):** ☑ Good Practice ☐ Tool ☐ Report

G3 Greenpack

b) **Country**

Germany

c) **Current status:** ☐ planned ☐ under preparing ☑ on-going ☐ finished

d) **Duration of the action:** **50** **Month**

e) **Type of action (choose please as many as you need):**

- ☑ vehicle procurement
- ☐ fleet mix
- ☑ vehicle deployment
- ☑ charging infrastructure
- ☐ logistics structure
- ☐ business models

- ☑ technology of electric vehicles
- ☐ subsidy, funding, measures
- ☑ experiences (good practices and use cases)
- ☐ special tricks and tips

- ☐ TCO calculators
- ☑ route optimization considering the charging infrastructure
- ☐ optimization and planning of charging stations infrastructure
- ☑ optimization of charging processes and systems

other:

- ☑ **swap battery**
- ☑ **charing batteries**

☐

f) **Developed by:**

☐ public authorities	☑ association
☐ public-private partnership	☑ research entity
☑ private sector	☐ other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

Swappable small battery (9kg, moveable, 48V),designed as a standard for mobility and transportation tasks in different small vehicles (scooters, pedelecs, cargo bikes, trikes, wheelchairs, tools, storages a.a.m.). Can be easily charged and swapped in office, workshop, public charging stations through an automated dispenser or at home.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

swappable battery of medium size 9kg, 8cm thick, 22cm high, 39cm long, 680 - 850 - 1400 Wh), easy to handle and easy to charge by normal plug-ins. Can also clustered for mor power. Deployed and charged in automated public dispenseres. Adaptable to all kind of round Li-Ion-cells.

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

to bring electric mobility to all kind of small vehicles for people and cargo transport in city areas. Create a network of automated dispenser stations in cities and make the last mile for all kind of deliveries electric.

er stations in cities

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results

(e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

n transport of people and cargo in urban areas, last mile with small EV, bring EV mobility to seniors

k) **What were the main success factors**

focus an small EV in cities with a mix of people and cargo transport

l) **Keywords** (please write just three most characteristic keywords for your example)

battery sharingsystem for small EV

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

9

n) **Stakeholders (please fill out tab "Stakeholders")**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☑ Technical challenges: **Developing a swappable and movable small battery and developing an automated dispenser with charging function , charing a cluster of batteries**

☐ Financial challenges:

☐ Politicial challenges:

☑ Partnership challenges: **Cooperation with several companies and also with Technical University**

☑ Other challenges: **Designing special EVs for seniors with cargo facilities**

3 FINANCES

a) **What was the total cost of the action?** **est. 1-2 Mio€** **Euro**

b) **How was the activity financed?**

☑ Own funding ☑ Co-financing (e.g. PPP) ☑ Local/Regional project ☐ National project ☐ EU project

☑ Other: cooperation with Technical University Beuth, Berlin

c) **Is there a business model described in the good practice, report or tool?**

yes

if yes, Mr. Allesch will contact you to create an eMobility Canvas Model (please fill in also 4 c)

4 CONTACT DETAILS (if relevant)

a) **Address details**

GreenPack mobile energy solutions gmbh, Johann-Hittdorfstr. 8, 12489 Berlin, Germany

b) **Link to the web-site (if applicable)**

www.greenpack.de

c) **only for EUFAL Test: please fill in your name or a shortcut and a phonenumber/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

Jürgen Allesch

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)
1	greenpack mobile energy solutions g	BE
2	Tobias Beyer	BE

Description	Contact details	Link
Factory to build small urban EV transport EV		www.greenpack.de
Marketing, PR	+4930639287250	info@greenpack.de
Johann-Hittdorfstr. 8, D 12489 Berlin		

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report (see also tab "Sources")

a) **Name of the (select one):** ☑ Good Practice ☐ Tool ☐ Report

G4 UPS Retrofit Strategy for 7,7t City transporter

b) **Country**

Germany

c) **Current status:** ☐ planned ☐ under preparing ☑ on-going ☐ finished

d) **Duration of the action:** **since 2010** **Month**

e) **Type of action (choose please as many as you need):**

- ☑ vehicle procurement
- ☑ fleet mix
- ☑ vehicle deployment
- ☐ charging infrastructure
- ☐ logistics structure
- ☐ business models

- ☑ technology of electric vehicles
- ☐ subsidy, funding, measures
- ☑ experiences (good practices and use cases)
- ☐ special tricks and tips

- ☐ TCO calculators
- ☐ route optimization considering the charging infrastructure
- ☐ optimization and planning of charging stations infrastructure
- ☐ optimization of charging processes and systems

other:

- ☑ **Retrofit strategy ICV to EV**
- ☐

☐

f) **Developed by:**

☐ public authorities	☑ association
☐ public-private partnership	☐ research entity
☑ private sector	☐ other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

UPS has a fleet of 7,5t Citytransporter UPS P80 ICV to deliver parcels and small goods to private and commercial customers. In cooperation with a small specialized company EFA-S GmbH (Elektro-Fahrzeuge-Schwaben GmbH) the P80 trucks with worn-out Dieselengines were retrofitted to EV. The lifespan of trucks will last 10 years more. The retrofit of a P80E costs about 65.000 €. Up to now more than 100 trucks were refitted.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

the most parts of the P80 trucks are made from aluminium, so the body of the truck was very reliable.. I makes sense after the life span of the diesel engine to refit the truck with an electric powertrain. This was cheaper than to buy a new diesel engine truck or even an electric truck, which cost more than 120.000 €

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

enlargement of the life time of the truck, to get an electric truck for less money and get a positive effect on urban environment. Also a positive response from customers and city governments.

er stations in cities

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results

(e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

n UPS and EFA-S got in 2012 the innovation reward for the UPS P80E as the best city truck: second life as a electric truck with 7,5 t total weight and a load of 3,5t with a volume of 23m³

s

k) **What were the main success factors**

a competent retrofit company like EFA-S GmbH and a serial number of 100 trucks ongoing

l) **Keywords** (please write just three most characteristic keywords for your example)

Retrofit strategies for trucks
stretching the life-time by retrofit
clean city transport

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

9

n) **Stakeholders (please fill out tab "Stakeholders")**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☑ Technical challenges: **developing a construction kit for retrofit**

☑ Financial challenges: **cost effectivness through bigger numbers of retrofitted trucks**

☐ Politicial challenges:

☑ Partnership challenges: **Cooperation of UPS with a small but specialized company**

☐ Other challenges:

3 FINANCES

a) **What was the total cost of the action?** **est. 1-2 Mio€** **Euro**

b) **How was the activity financed?**

☑ Own funding ☐ Co-financing (e.g. PPP) ☐ Local/Regional project ☐ National project ☐ EU project

☐ Other:

c) **Is there a business model described in the good practice, report or tool?**

yes

if yes, Mr. Allesch will contact you to create an eMobility Canvas Model (please fill in also 4 c)

4 CONTACT DETAILS (if relevant)

a) **Address details**

EFA-S GmbH, Daimlerstr. 14, D 73119 Zell unter Aichelberg, Germany

b) **Link to the web-site (if applicable)**

www.efa-s.de

c) **only for EUFAL Test: please fill in your name or a shortcut and a phonenumber/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

Jürgen Allesch

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)
1	**Herr Bastian Beutel**	**BE**

Description	Contact details	Link
Management		www.efa-s.de
Daimlerstr. 14, D 73119 Zell u.A.	+497164919847	info@efa-s.de

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report (see also tab "Sources")

a) **Name of the (select one):** ☑ Good Practice ☐ Tool ☐ Report

G5 Procurement of EV (Story of Baker Schueren)

b) **Country**

Germany

c) **Current status:** ☐ planned ☐ under preparing ☑ on-going ☐ finished

d) **Duration of the action:** **since 2016** **Month**

e) **Type of action (choose please as many as you need):**

- ☑ vehicle procurement
- ☑ fleet mix
- ☑ vehicle deployment
- ☐ charging infrastructure
- ☐ logistics structure
- ☐ business models

- ☐ technology of electric vehicles
- ☐ subsidy, funding, measures
- ☑ experiences (good practices and use cases)
- ☐ special tricks and tips

- ☐ TCO calculators
- ☐ route optimization considering the charging infrastructure
- ☐ optimization and planning of charging stations infrastructure
- ☐ optimization of charging processes and systems

other:

- ☑ **market driven approach by a specific group of customers**
- ☐

☐

f) **Developed by:**

- ☐ public authorities
- ☐ public-private partnership
- ☑ private sector
- ☑ association
- ☐ research entity
- ☐ other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

Baker Scueren alone has more than 32 branches in different towns and he startet an association of more than 100 bakers nationwide. First they developed a requirement specification for an EV for bakers and food logistics and send this to 51 OEMs and supply companies europe-wide. Only few answered and at the end the streetscooter company won the tender and several 100 of streetscooters were ordered.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

Baker Schueren saw in the near future a need for a clean and environment friendly food logistic in the cities. He soon realised that only a pressure group of potenial customer can set pressure to the OEMs and bring their request for EV into the public and medias.

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

making the public and OEMs aware that their is a need for EV especially in commercial city logistic. This group of food logistic dependend customers were also able to pay the higher price of EV.

er stations in cities

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results

(e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

n In opposition to the private EV user are the commercial EV user very visible in the cities and the public became much more aware of the advantages of EV. Also is the lack of charging infrastructure not so sensitive at the beginning because most commercial EV are charged in the bakery or depot and make their tours and came back to the bakery or depot in the afternoon.

s

k) **What were the main success factors**

initiative of a powerful opinion leader who understands the needs of his interest group and a network of companions followed by a good PR and media resonance. Everydody understands the nessessity of food logistics in big cities.

l) **Keywords** (please write just three most characteristic keywords for your example)

market driven approach
using the power of interest groups
using the media

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

9

n) **Stakeholders (please fill out tab "Stakeholders")**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☑ Technical challenges: **developing a requirement specification for food logistic**

☑ Financial challenges: **cost effectivness through bigger numbers of ordered EVs**

☑ Politicial challenges: **Using interest groups, lobbying**

☑ Partnership challenges: **using the power of networks and associations**

☐ Other challenges:

3 FINANCES

a) **What was the total cost of the action?** **very low** **Euro**

b) **How was the activity financed?**

☑ Own funding ☐ Co-financing (e.g. PPP) ☐ Local/Regional project ☐ National project ☐ EU project

☐ Other: using the public medias

c) **Is there a business model described in the good practice, report or tool?**

yes

if yes, Mr. Allesch will contact you to create an eMobility Canvas Model (please fill in also 4 c)

4 CONTACT DETAILS (if relevant)

a) **Address details**

Bäckerei Schüren, Roland M. Schüren, Mühlenbachweg 9, D 40724 Hilden, Germany

b) **Link to the web-site (if applicable)**

www.ihr-bäcker-schüren.de

c) **only for EUFAL Test: please fill in your name or a shortcut and a phonenumber/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

Jürgen Allesch

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)
1	**Bäckerei Schüren, Roland M. Schüre**	**BE**

Description	Contact details	Link
Mühlenbachweg 9, D 40724 Hilden, Germany	49210320170	www.ihr-baecker-schueren.de

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to Integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report

a) **Name of the Good Practice, Tool or Report:**

P1 Green Mile Cold Chain

b) **Country**

POLAND

c) **Current status:** ☐ planned ☐ under ☑ on-going ☐ fnished

d) **Duration of the action:** **From May 2017 till now**

e) **Type of action (choose please as many as you need):**

☑ vehicle procurement
☑ fleet mix
☑ vehicle deployment
☐ charging infrastructure
☑ logistics structure
☐ business models

☑ technology of electric vehicles
☐ subsidy, funding, measures
☑ experiences (good practices and
☐ special tricks and tips

☐ TCO calculators
☐ route optimization considering the charging infrastructure
☐ optimization and planning of charging stations
☑ optimization of charging processes and systems

f) **Developed by:** ☐ public authorities ☐ association

☐ public-private partnership ☐ research entity
☑ private sector ☐ other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

Our goal is developing and producing advanced, clean and environmentally friendly mobile refrigeration system for EV, ELV market application. Our idea is a creating system of the clean and zero pollution cold chain, which enable to use of electric vehicles as the main means of transporting perishable goods at any stage of distribution.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

The main problem that lead us to create our solutions is a fact that the most of the models used for the realisation of the last stage of the cold chain is implemented with using of the wheel transport. Most of the refrigeration unit used for the transport of the perishable goods are driven directly or indirectly by the petrol or diesel engines. On the market now there is a lack of the solutions for cold chain designed for small EV, ELV vehicles. Our Idea is a whole system of the special designed independed refrigerated containers with electric refrigeration unit powered by own batteries (als powered by the solar panells, hydrogen cells) which cen be easily transported and used for last mile distribution by the different EV an ELV wehicles (Cargo bikes, small Electric Vehicles).

i) **Objectives:**

What was the purpose and the sustainability objective of the tool?

Creating of clean and zero emission refrigeration systems for last mile cold chain.

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results (e.g. % energy savings achieved, % reduction of UFT in city centres, etc)

Currently our tests are underway, the results will be published in a short time.

k) **What were the main success factors**

Creating independed electric refrigeration unit and cooling box for the Cargo bike and other EV vehicles which can can work 12 hour on single charge and allow to transport goods in constant 0 ° C. Developing own controller and software for inverter compressor and electronic expansion valve powered by the 48V DC Li-oin battery system and solar panells.

l) **Keywords**

Green Mile Cold Chain, Battery refrigeration, Cargo Bike refrigeration System, Electric Vehicle refrigeration system, Mobile refrigeration, Zero pollution mobile refrigeration system.

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

TRL1, TRL2, TRL3, TRL5, TRL6, TRL 7

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☑ Technical challenges:

Creating low consumption and low weight refrigeration system powered by the 48V DC.
Creating own controll and energy saving system.
Adaptation of the inverter and BLDC systems for mobile refrigeration.

☐ Financial challenges:

☐ Politicial challenges:

☑ Partnership challenges:

☐ Other challenges:

3 FINANCES

a) **What was the total cost of the action?** **20 000 EURO**

b) **How was the activity financed?**

☑ Own funding ☐ Co-financing (e.g. PPP) ☐ Local/Regional project ☐ National project ☐ EU project

☐ Other:

c) **Is there a business model described in the good practice or tool?**

Yes we have developed own model of the cold chain which can use our technology for transport and storage of the perishable goods.

4 CONTACT DETAILS (if relevant)

a) **Address details**

Green Cold Marcin Olejnik
42-216 Czestochowa
ul. Zrodlana 19/6
Mobile +48 506132861
Mail: greencold@greencold.pl

b) **Link to the web-site (if applicable)**

http://greencold.pl/

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)	Description	Contact details	Link
1	**Marcin Olejnik**	**BE, RE**	**Engineer of the refrigeration Solution**	Mobile: +48 506132861	**greencold@greencold.pl**
2	**Tomasz Zielniński**	**BE, RE**	**Engineer of the refrigeration Solution**	Mobile: +48 512656148	**sales@greencold.pl**

The Project EUFAL (Electric Urban Freight And Logistics) addresses one key area of Electro Mobility Europe Programme: integration of urban freight and city logistics in e-mobility. It aims at providing a platform of exchange as a decision support system for companies willing to integrate electric vehicles (EV) in commercial vehicle fleets. The EUFAL platform will provide tools for companies at different stages of EV implementation: early planning of EV use, implementation of EV use, optimisation of the EV implementation. It will uptake and unite existing research results and technological developments of ongoing research projects (national, transnational, European) in commercial transport including fleet management and optimizing their composition.

1. Description of Good Practice, Tool or Report (see also tab "Sources")

a) **Name of the (select one):** ☐ Good Practice ☐ Tool ☐ Report

T1 Fast Distribution Services and Logistics (hepsiexpress.com)

b) **Country**

turkey

c) **Current status:** ☐ planned ☐ under preparing ☑ on-going ☐ finished

d) **Duration of the action:** **10** **Month**

e) **Type of action (choose please as many as you need):**

- ☐ vehicle procurement
- ☑ fleet mix
- ☑ vehicle deployment
- ☐ charging infrastructure
- ☑ logistics structure
- ☐ business models

- ☐ technology of electric vehicles
- ☐ subsidy, funding, measures
- ☑ experiences (good practices and use cases)
- ☑ special tricks and tips

- ☑ TCO calculators
- ☐ route optimization considering the charging infrastructure
- ☐ optimization and planning of charging stations infrastructure
- ☐ optimization of charging processes and systems

other:

- ☐
- ☐

☐

f) **Developed by:**

- ☐ public authorities
- ☐ public-private partnership
- ☑ private sector
- ☐ association
- ☐ research entity
- ☐ other

g) **Description of the Good Practice, Tool or Report:**

Specify area covered of the city, resources needed, etc

Integration of EVs in the fleet for freight distribution of an online store in İstanbul. Conventional fossil fuel light commercial vehicles are converted to EVs by a local producer (BD Oto) and adopted for distribution activities in four regions of İstanbul: Şişli, Kadıköy, Gebze, and Kartal. Four vehicles are currently in use having GVW between 1.5t – 3.5t. The vehicles have both Level-2 and Level-3 charging optionsThe maximum range of the vehicles are 200 kms. After charging 10 hours, each vehicle covers an average of 180 kms per day in a 6 hour shift. Because of the difficulty of finding charging stations in the city, the vehicles return to charging points before their battery level falls below 20%.

h) **Starting point:**

What was the main problem, idea or motivation that led to the development and introduction of good practice, tool or report?

The motivation of the project is twofold:
1. Cutting the fuel costs and environmental burden of fossil fuel vehicles used in the distribution.
2. Creating a environmentaly friendly and positive company image.

i) **Objectives:**

What was the purpose and the sustainability objective of the good practice, tool or report?

j) **Benefits**

Please specify qualitative and quantitative environmental, economic and social results
(e.g. % energy savings achieved, % reduction of Urban Freight Transport in city centres, etc)

Reduction in the operational costs and CO2 emmisions related to distribution services. EVs are 200% more energy efficient, as opposed to 5% increase in electricity costs.

k) **What were the main success factors**

l) **Keywords** (please write just three most characteristic keywords for your example)

Adoption of Evs in the fleet
Urban freight distribution

m) **Technology Readines Level TRL (see tab TRL) - if applicable**

TRL9

n) **Stakeholders (please fill out tab "Stakeholders")**

2 Challenges

a) **What challenges encountered by the problem and how were they overcome?**

☐ Technical challenges:

☑ Financial challenges:

hallenges are overcome by using alternate financing options, such

☑ Politicial challenges:

he project, conflicts emerged within the management on the feasib

☐ Partnership challenges:

☐ Other challenges:

3 FINANCES

a) **What was the total cost of the action?** **10000** **Euro/year**

b) **How was the activity financed?**

☑ Own funding ☐ Co-financing (e.g. PPP) ☐ Local/Regional project ☐ National project ☐ EU project

☐ Other:

c) **Is there a business model described in the good practice, report or tool?**

No

if yes, Mr. Allesch will contact you to create an eMobility Canvas Model (please fill in also 4 c)

4 CONTACT DETAILS (if relevant)

a) **Address details**

Kuştepe mah. Mecidiyeköy Yolu cad. no 12 Trump Towers kat 2 Kule 2 Şişli İst.

b) **Link to the web-site (if applicable)**

www.hepsiexpress.com

c) **only for EUFAL Test: please fill in your name or a shortcut and a phonenumber/eMail adress in case there are questions for clarity or a eMobility Canvas Model to built**

Deniz TOSUN deniz.tosun@hepsiexpress.com

Involved stakeholders

No	Name	Type (PA - Public authority, BE - business entity, RE - research entity, A - association, O - Other)	Description	Contact details	Link