



## PV Days 2017

New Paths for the Mobility of Tomorrow. Vision and Realization of the  
Research Project Adaptive City Mobility

**Nathaniel Smith**

Consultant

Green City Projekt GmbH

Green City Projekt

Green City  
Mehr Umweltschutz.

Green City Energy

GREENCITY



Green City  Projekt



**CHANGE FOR THE BETTER**

**Environmental protection and  
climate change adaptation**

**Sustainable  
Mobility**

**Urban  
Culture and  
public  
Spaces**

**Renewable  
Energy**

**Quality of Life**

## CONSULTING & RESEARCH

Mobility

Energy

Partizipation

## COMMUNICATION

Live  
Communication

Campaigning  
& Networking

Marketing

# EXPERIENCE

---

KNOW HOW

---



CHANGE

---



EMOTION

---



# REINVENT CITY AND PUBLIC SPACE



**RETHINK  
TRAFFIC & MOBILITY**

---



**INITIATE CLIMATE  
PROTECTION PROCESSES  
AND RENEWABLE ENERGY**

---



COMMUNICATION,  
MARKETING AND PR FOR  
ENVIRONMENTAL PROTECTION

---



# DEVELOP SUSTAINABLE BUSINESS MODELS

---

Call a Bike

**DB** BAHN

07000-5225522  
www.CALLABIKE.de

Call a Bike – ganz ein

Zur Anmeldung und für weitere Informationen:  
Telefon 07000 5225522\* oder [www.callabike.de](http://www.callabike.de)

**Entleihen:** Telefonnummer auf dem Schlüsselbuckel anrufen, erhaltenen  
Öffnungscodes ins Schloss Display eingeben, Sperrriegel entriegeln.

**Rückgabe:** CallaBike verriegeln, im Schloss Display  
die Rückgabe mit „Ja“ bestätigen, Quittungscodes  
und Standort telefonisch durchgeben.

Call a Bike wünscht  
Gute Fahrt!

© 2010 Call a Bike, Verkehrs-DB AG  
Hilfsleistungen

# PROJECTS

---

KNOW HOW

---



CHANGE

---



EMOTION

---



**250,000 VISITORS,  
1.5KM OF STREET, 2x PER  
YEAR**

—  
STREETLIFE FESTIVAL



# ONE CITY EXPERIENCES THE BIKE

RADLHAUPTSTADT MÜNCHEN





**50 “LIVING & MOBILITY”  
MEASURES IN  
5 EU-CITIES**

CIVITAS EU PROJECT “ECCENTRIC”

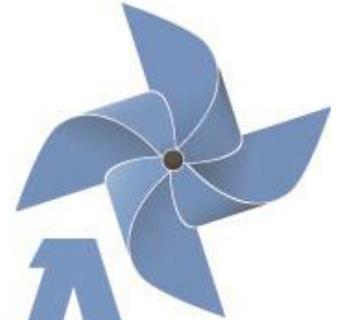
# E-MOBILITY IN RURAL SPACE WITH 12 MODEL MUNICIPALITIES

PROJECT "LANDMOBILE"



**ONE MIGHT BE GLAD IF  
THE AIR WERE AS PURE  
AS THE BEER**

RICHARD FREIHERR VON  
WEIZSÄCKER



**SAUBA  
SOG I.**

**REINHEITSGEBOT  
FÜR MÜNCHNER LUFT**

# NOT A CAR – AN E-MOBILITY SYSTEM

ADAPTIVE CITY MOBILITY



 Die  
Bundesregierung



Gefördert durch:

 Bundesministerium  
für Wirtschaft  
und Energie

aufgrund eines Beschlusses  
des Deutschen Bundestages



Adaptive  
City  
Mobility

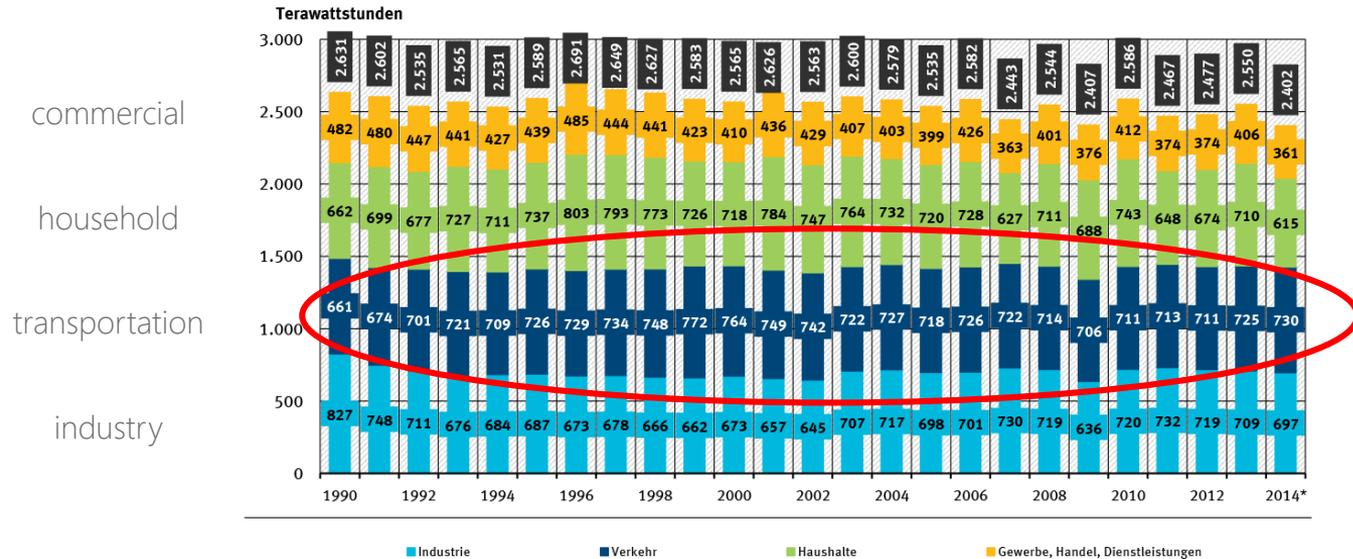
---

## Vision

Competitive and emission-free  
eMobility **system** for cities

## eMobility: Why?

Development of energy consumption per sector: industry, transportation, household, and commercial (1990-2015)

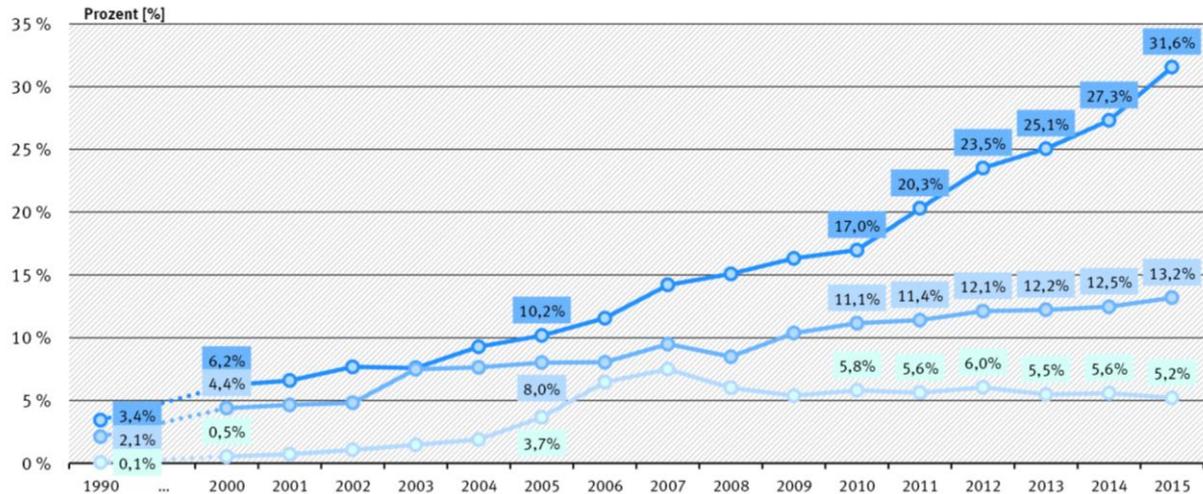


Transportation is about 1/3 of the total energy consumption

(Umweltbundesamt, 2016)

## eMobility: Why?

Share of renewable energy in gross electricity consumption, final energy consumption for heat, and transportation (1990-2015)

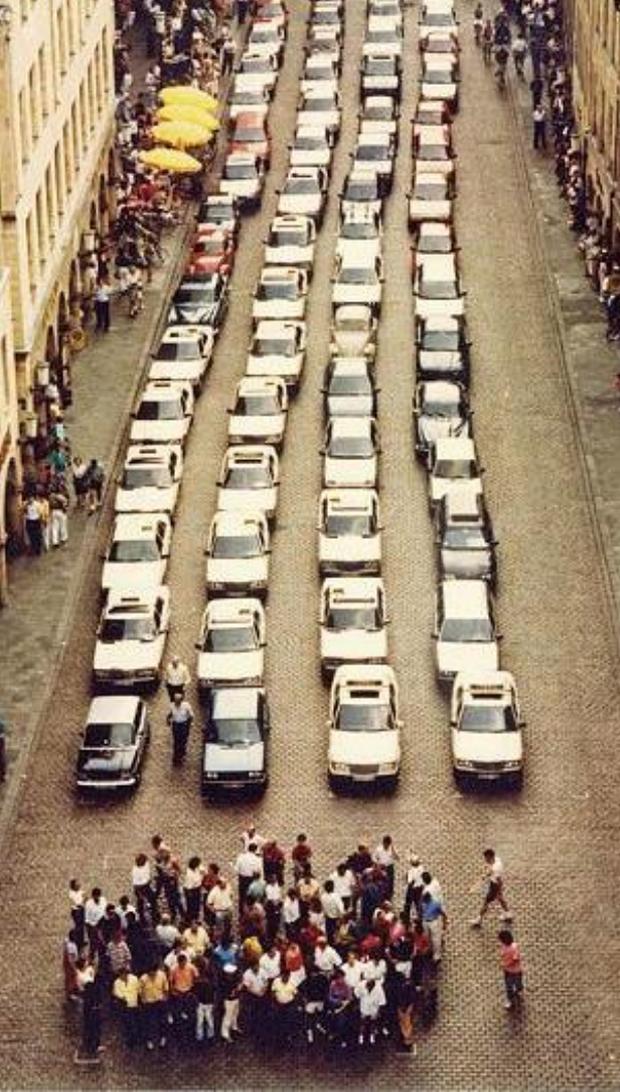


electricity

heat

transportation

(Umweltbundesamt, 2016)



## City eTAXI

Resource efficient. Environmentally Friendly. Low Price.



Gefördert durch:



aufgrund eines Beschlusses  
des Deutschen Bundestages



Leuchtturmprojekt der Elektromobilität 2015



## The Project Partners





## The Challenges

Price

Range

Infrastructural Cost / Network Integration

Renewable Energy

Competitive Business Model



Three main innovations  
to reach the ecological and economic goal



## Innovation 1: City lightweight vehicle without „limitations“





## Light Electric Vehicle

„Less is More“ – „Form Follows Function“

- Ample room for a driver, two passengers and their luggage
- 550 kg incl. Batteries / L7E classification  
90 km/h max speed
- Removable Seats make room for a fully loaded Euro-palette
- Reduction of vehicle costs: up to 50%

Passenger compartment out of carbon (weighs only 40 kg)



## Removable Seats make room for a fully loaded Euro-palette



## Innovation 2: Manual Battery Swapping System



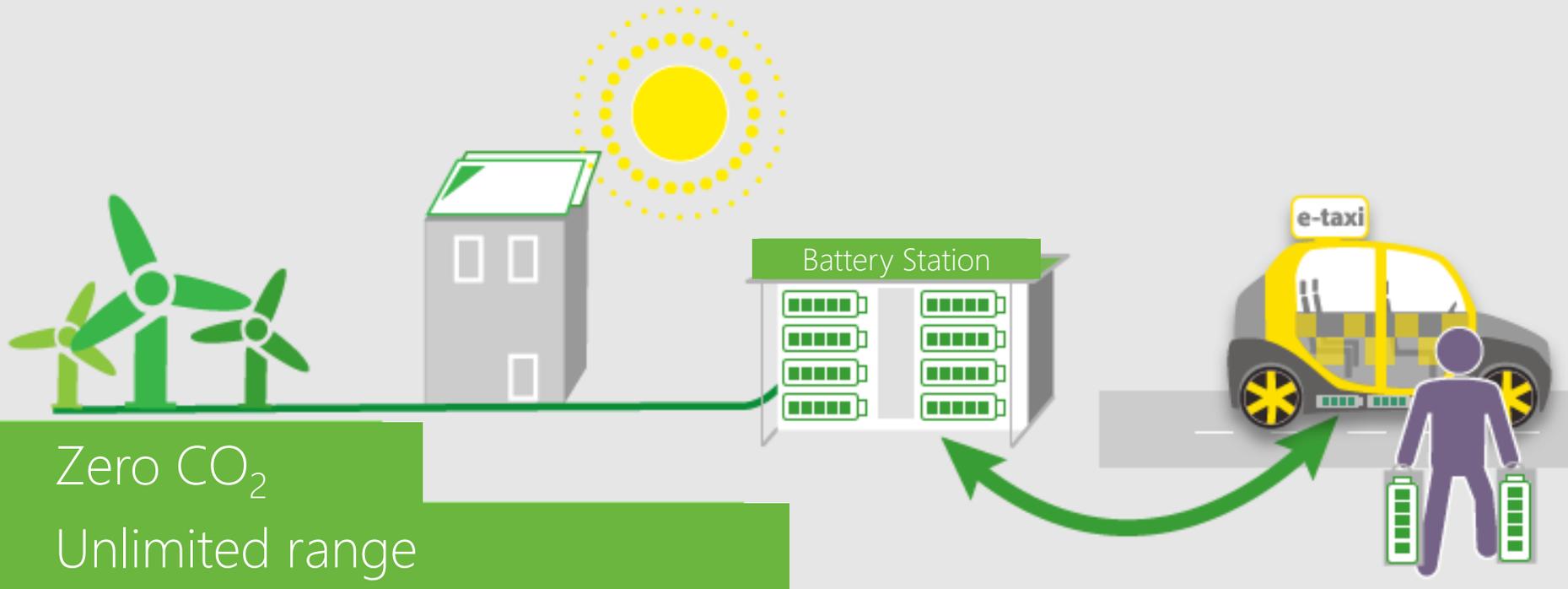


## Manual Battery Swapping System

“Drive, don’t charge”

- Empty batteries are exchanged manually at the appropriate stations
- Additional charging times and infrastructure bottlenecks are avoided
- Maximum turnover through 24/7 operation
- Implementation of renewable energy during “off hours”

## Easy integration from renewable energy sources



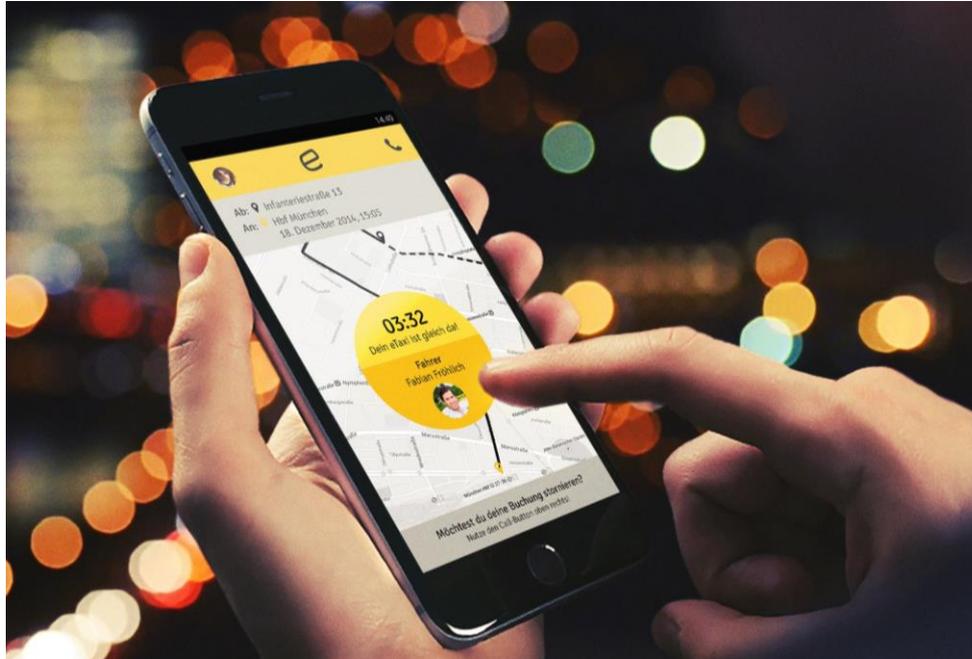
## Mobile battery cart allows for flexible installation and assists in swap



Source: E. ZIEGLER Metallbearbeitung AG

## Innovation 3: Intelligent eFLEET network with live data





## Intelligent Networking and Sharing

"Share instead of own" - "Mobility as a service"

- The CITY eTAXI represents a partial element of an entire CITY eFleet
- Costs are shared lowering the TCO
- Real-time data also brings added value via digital advertising and a comprehensive billing software

# Fleet Controlling



Advertisement



App



Passenger Entertainment



Driver Support



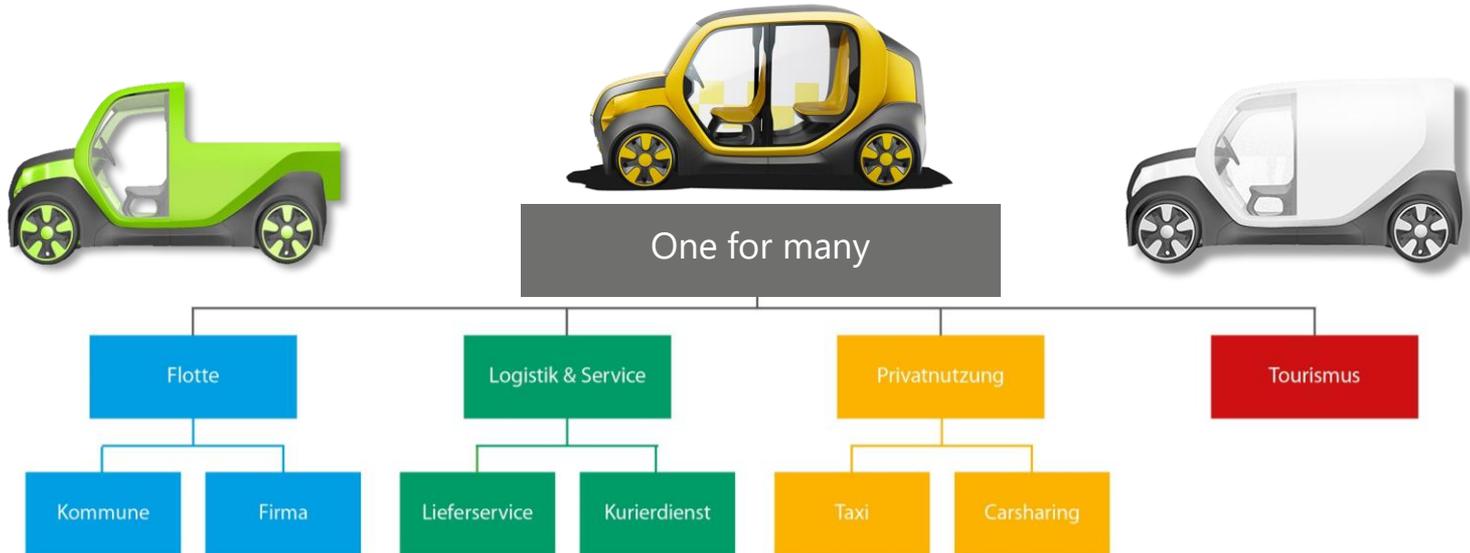
Energy management

## ACM Multi-Mode



## ACM Multi-Mode

a system platform that allows various uses and can be flexibly combined and easily implemented



## Information and advertising displays



# Job control application for the driver

Neue Buchungs-Anfrage  
Hbf München >> Theresienhöhe 4  
Jetzt

2014 ★ Do. 18.12.2014 Fr. 19.12.2014 Sa. 20.12.2014 >

Route anzeigen ✓ Anfrage annehmen

Datum	Uhrzeit	Kunde	Annahme
18.12.2014	13:45	👑	
18.12.2014	13:50		
18.12.2014	15:05		●
18.12.2014	15:45		
18.12.2014	16:10	👑	
18.12.2014	17:35		●

✕ Abbrechen ✓ Bestätigen

## Central processing unit for the eFLEET



## Unique Selling Point

**Infrastructure:** Easy-to-implement + independent energy system

**Design:** Space miracle + driving experience

**Application:** Flexible ranges >> Multifunctional use



eTAXI



eTOUR



eSHARING



eLOGISTICS

One for many. Eins für vieles. Oans fua ois.



Adaptive  
City  
Mobility

---

## Reality vs. Vision:

Planned multimode form does not fit Munich law

Regulations limit sharing possibilities

Future mobility options need to be addressed on a political level

Next Step: Participation!  
8 "Pilot cars" in Munich 2018



Gefördert durch:



aufgrund eines Beschlusses  
des Deutschen Bundestages



Leuchtturmprojekt der Elektromobilität 2015



## The Project Partners





**Nathaniel Smith**

Consultant

[smith@greencity-projekt.de](mailto:smith@greencity-projekt.de)

GREEN CITY PROJEKT GMBH

Albert-Roßhaupter-Str. 32

D-81369 München

[www.greencity-projekt.de](http://www.greencity-projekt.de)

**CHANGE FOR THE BETTER**