

## **ALTER-MOTIVE** National Workshop - The Netherlands

*Demonstration programs for  
Alternative Fuels and Alternative Mobility Technologies  
Examples from Germany*

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NOW 2009



# Overview

- Alternative Fuels and Drives Strategy (VES)
- National Innovation Program (NIP)
- NIP – The Clean Energy Partnership (CEP)
- Model Regions E-Mobility
- Further Demonstration Activities

# Alternative Fuel and Drives Strategy (VES)

- **Fuel Strategy of the Federal Government:**
  - >> National Sustainability Strategy (BMVBS, 2004)
- Objectives:
  - Reduce CO<sub>2</sub> and other pollutants, increase energy security, alternative fuels based on renewables
  - Support *Market Penetration* of economic and environmental Alternative/Renewable Fuels and Innovative Drives
  - Identification of promising alternatives for accelerated development in accordance with the FG „Program of Measures“
  - VES identified the strategy based on analysis of alternatives
    - >> lead to the establishment of National Innovation Program



BMVBS

# National Innovation Program (NIP)

- Initially for H<sub>2</sub> and FC created by BMVBS, BMWi, BMBF and BMU
- German High-Tech Strategy – coordinated with the “Federal Fuel Strategy”
- Common framework and platform for numerous H<sub>2</sub> and FC R&D&D projects involving science & industry
- 2007 – 2016 – Budget: 1.4 Billion € (Gov. & Ind.)
- Activities funded: R&D and Large scale Demo

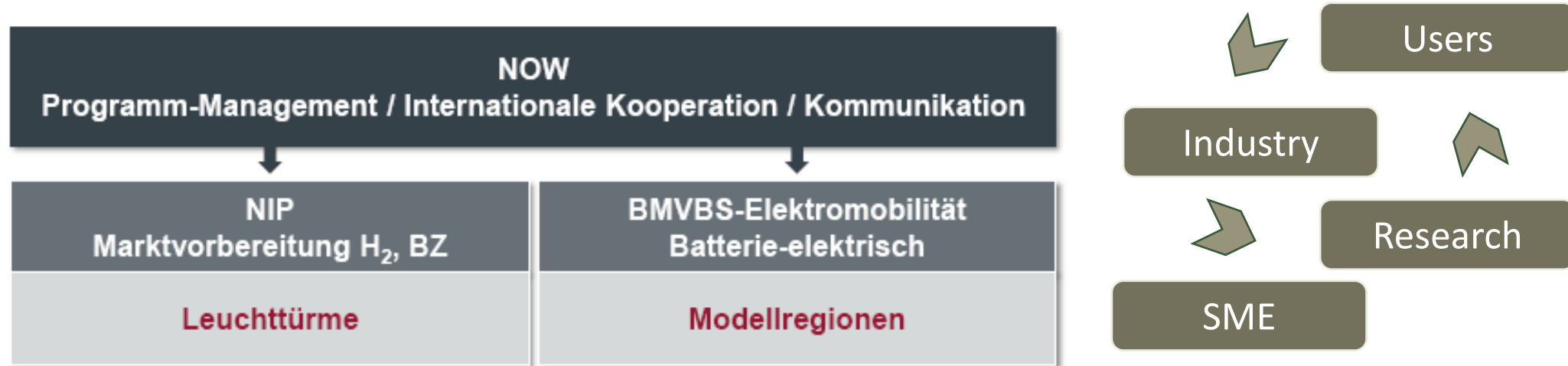


Nationales Innovationsprogramm  
Wasserstoff- und  
Brennstoffzellentechnologie

# National Innovation Program (NOW)

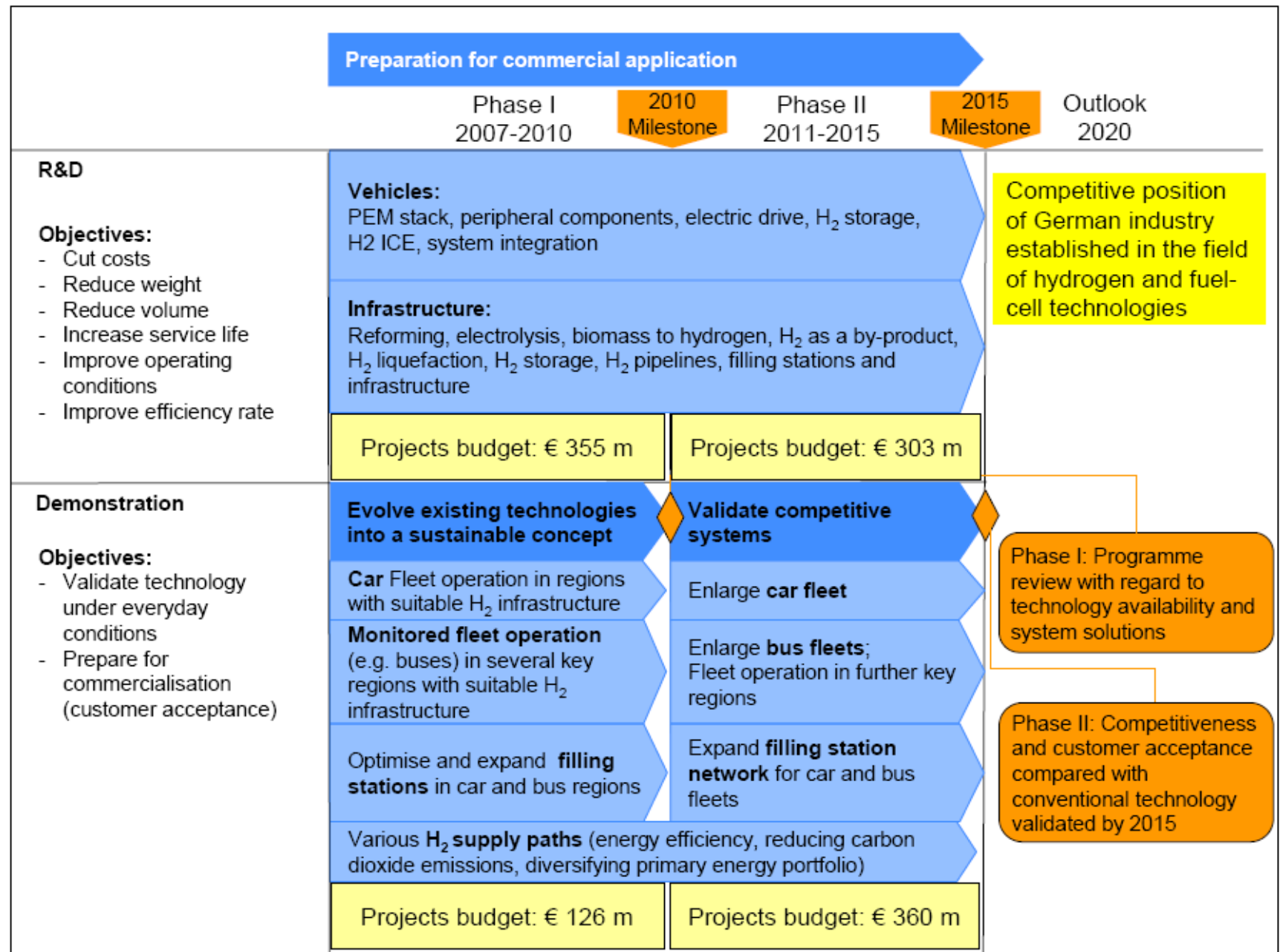


- Objective: R&D >> Develop products >> Market Ready



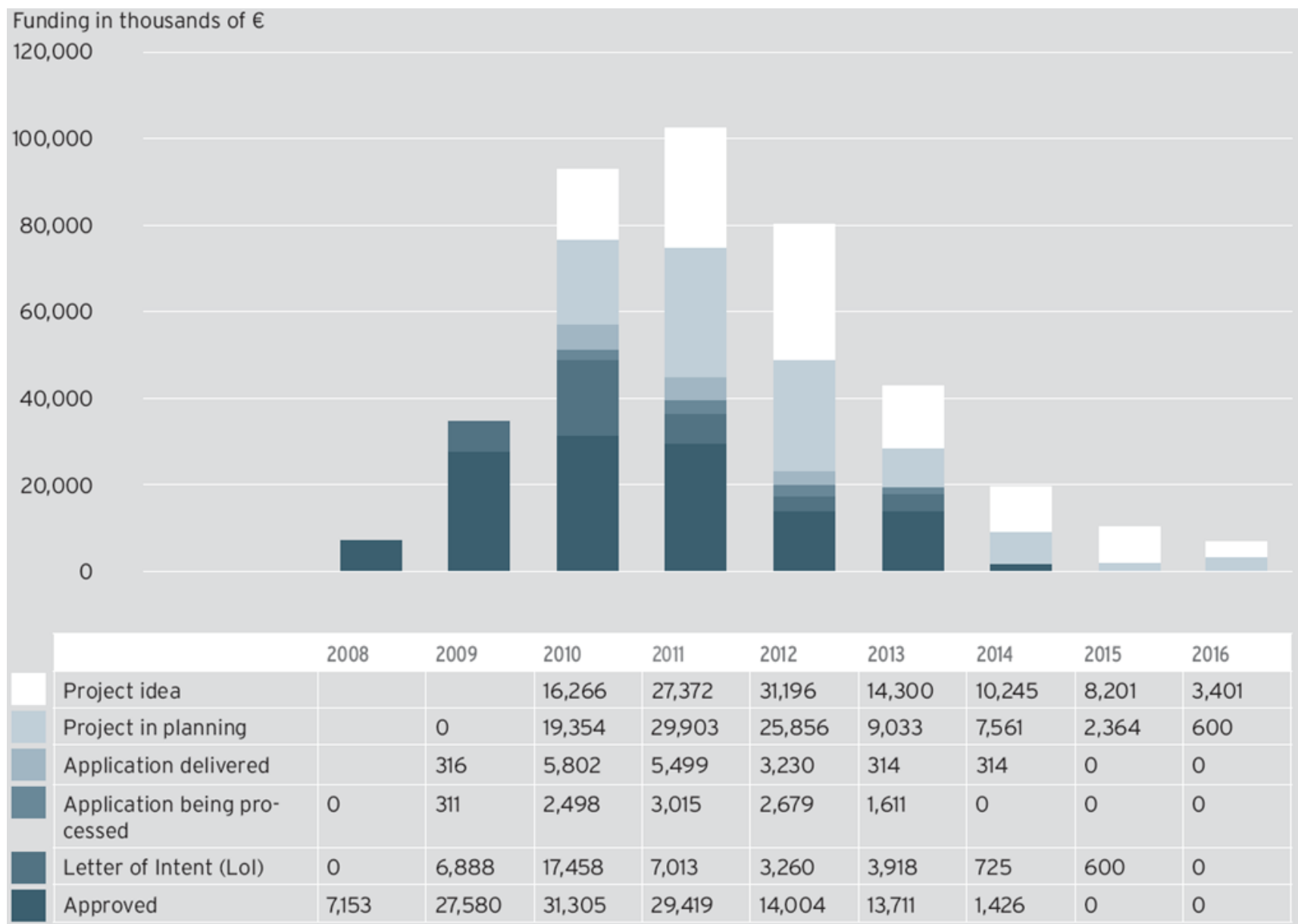
- Three program areas:
  - Transport and H<sub>2</sub> Infrastructure,
  - Stationary Energy Supply and Special Markets
- NOW founded in 2008 as implementation body of the NIP

# NIP – Development program 2006-2016



Nationales Innovationsprogramm  
Wasserstoff- und  
Brennstoffzellentechnologie

# NIP – Projects funded



Source: NOW 2009

# NIP – The Clean Energy Partnership

- Aim: demonstrate the everyday suitability of hydrogen as a fuel for vehicles and test refueling infrastructure. (Superordinate module)
- Execution of associated projects (e.g. 2009 - 23):
  - Research fuelling stat. storage, handling
  - FC/H2 vehicles demo (acceptance, opt. H2/CPI, ETC)
  - FC Bus fleets/midibus
  - FC production
  - H2 Production



Clean Energy Partnership (CEP)



# NIP – The Clean Energy Partnership

- Key regions: Berlin, Hamburg
- 30 PC daily use (40 more coming!) >> Buses
- 2009: Refueling Station Opening in Berlin
- Phase II: 2008-2011- 58.3 Mio. € (48% NIP)

## CEP Partners:

BMW Group, Berliner Verkehrsbetriebe  
BVG, Daimler, Ford, GM/Opel, Hamburg  
Hochbahn, Linde, Shell, StatoilHydro,  
TOTAL, Vattenfall Europe, Volkswagen



Clean Energy Partnership (CEP)

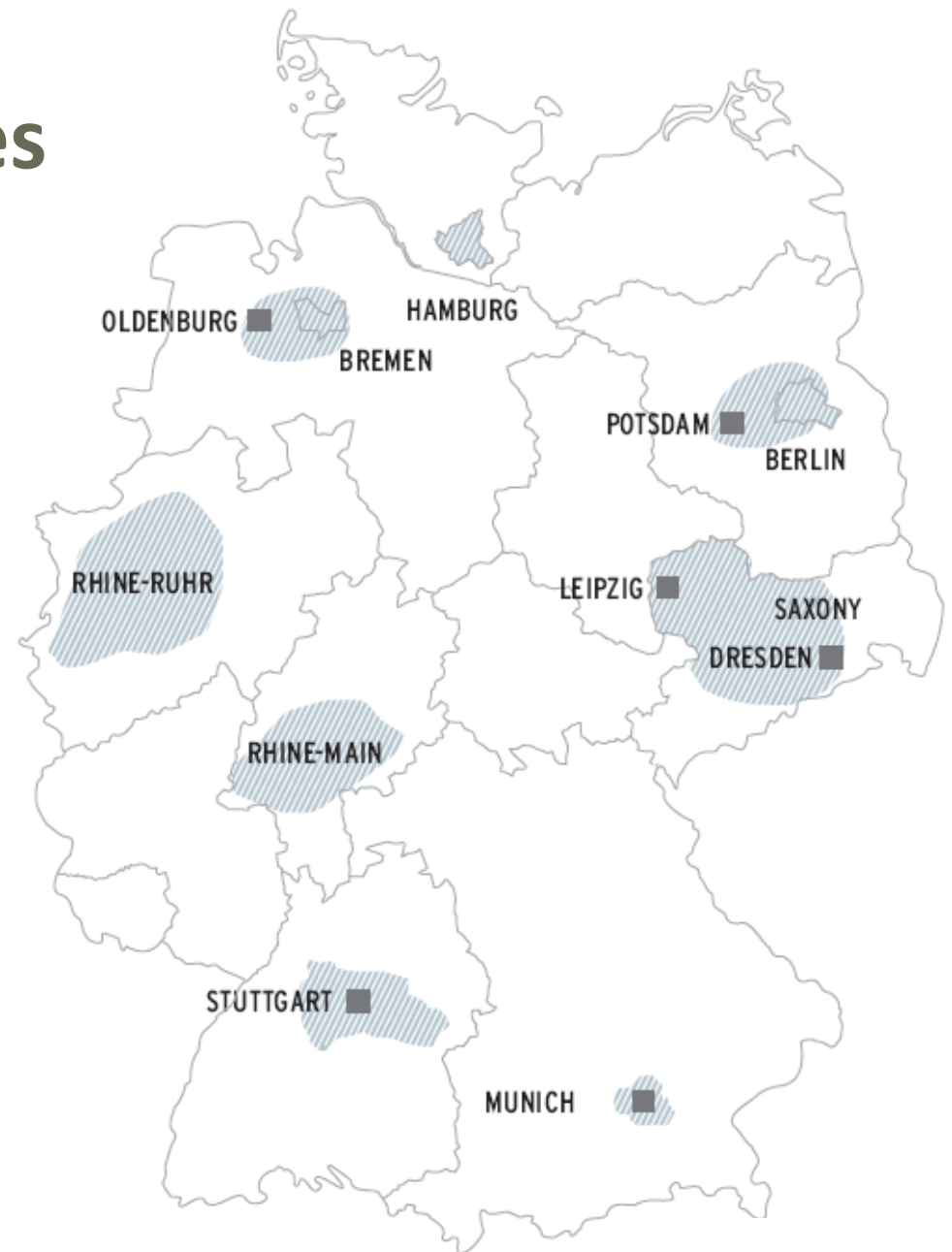
# Model-Regions E-Mobility



- Model Regions Program initiated by BMVBS (part of economic stimulus package)
- Vision: Germany must become the leading E-mobility market worldwide
- Establishment of 8 Model-Regions (see map)
- Objective: anchor E-mobility in the public sphere
- Budget: 115 Million € (2011) >> 500 Mio. €
- Since 2009 NOW coordinates MR E-mobility.

# MR E-Mobility - Objectives

- Science, Industry and Local Authorities
- Integrate EVs into everyday operations
- Infrastructure installations
- Public recognition
- New mobility concepts
- Integration transport opt.
- future business models
- User behavior/acceptance

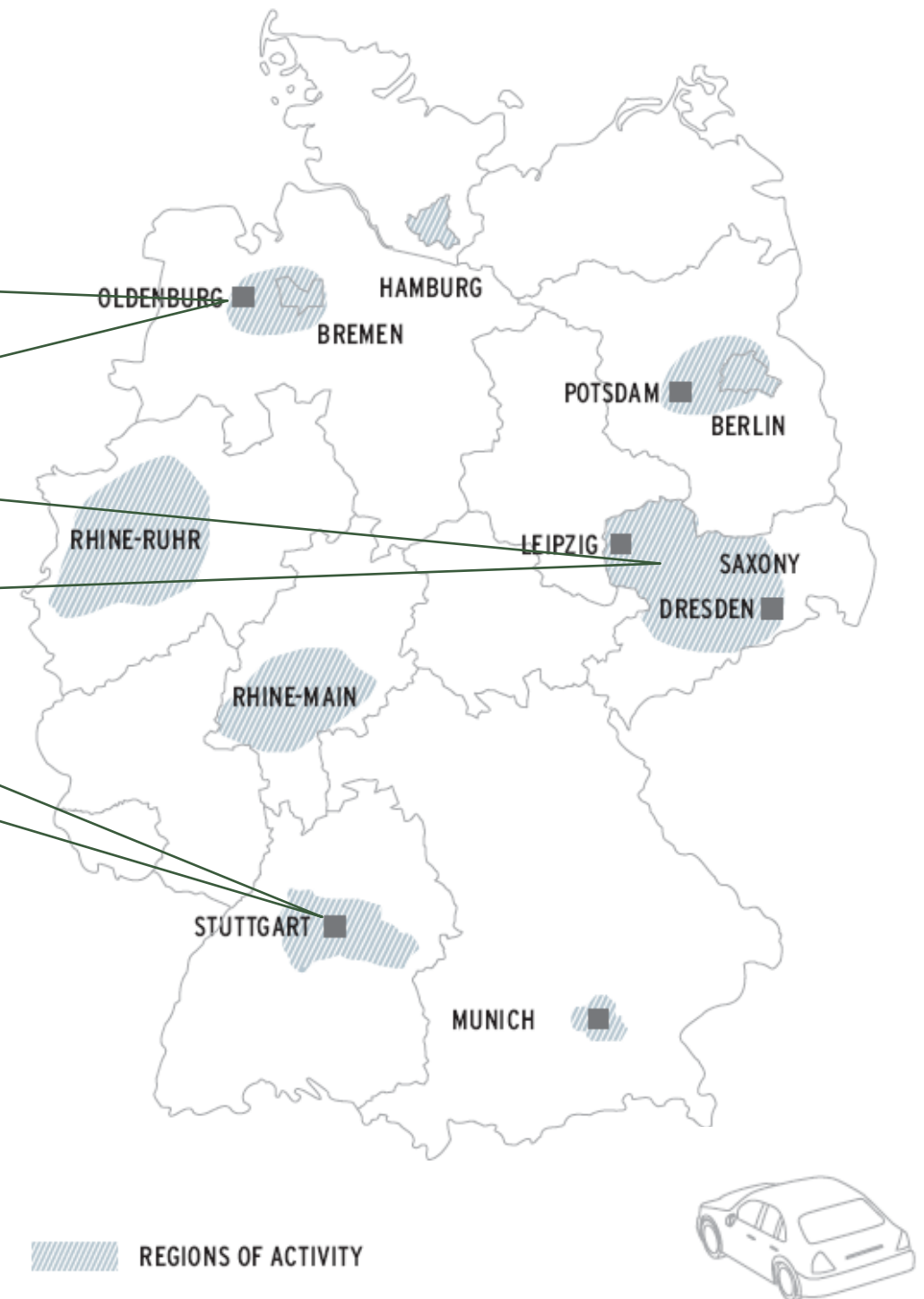


 REGIONS OF ACTIVITY



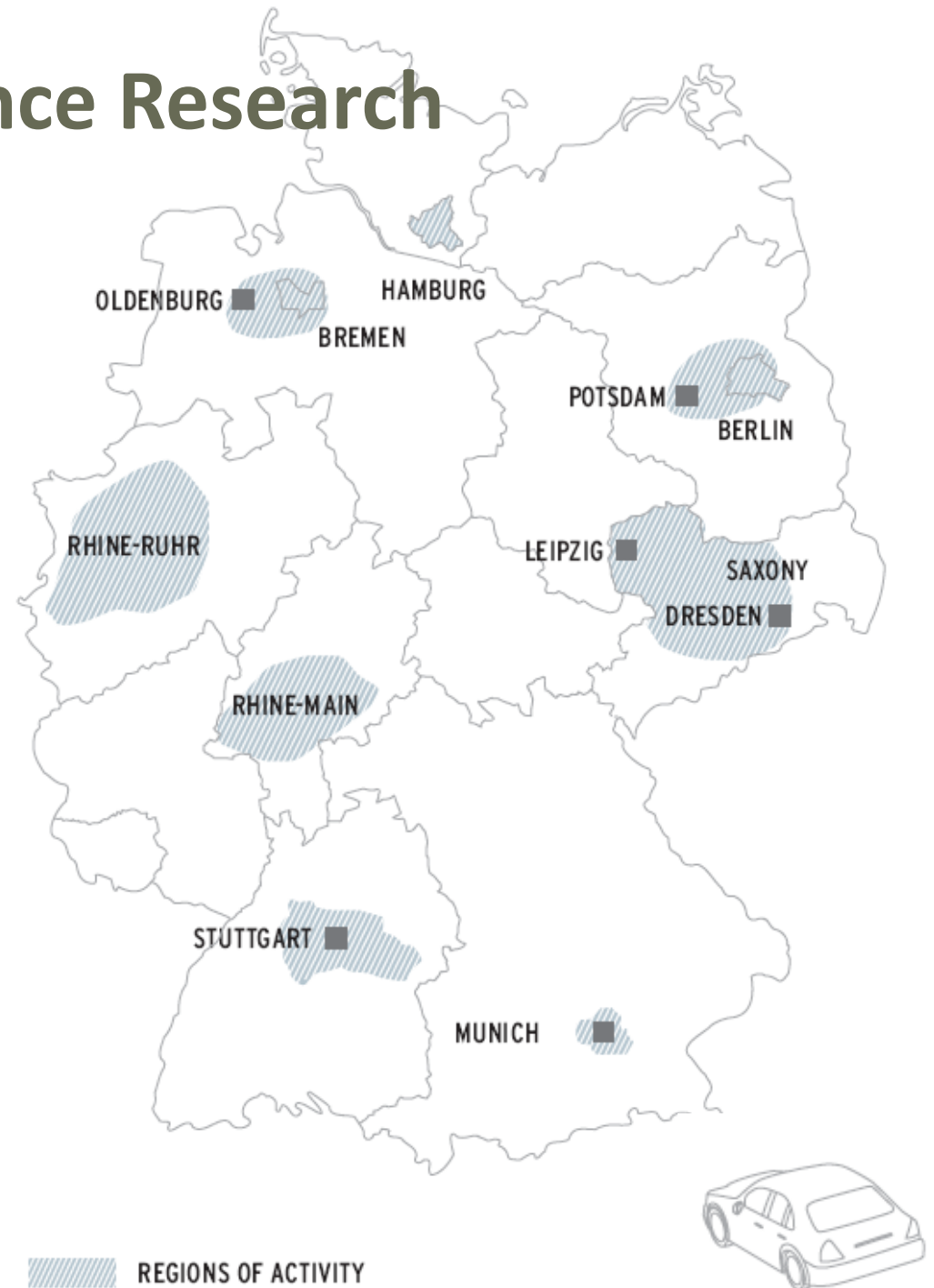
# MR E-Mobility

- 4 Modules (9.5 Mio. €):
  - Demo Projects in:
    - 90 EV, 30 2-wheelers & 5 LEV
  - Infrastructure
  - Car-sharing fleets (ecar4all)
  - Inter-modal hubs
  - Demonstrations of charging infrast.
  - Billing and roaming models
  - Fleet charging hybrid buses (10)
  - 1000 vehicles use (700 sc., 450 b)
  - 40 Electric vehicles
- Infrastructure
- LEV, Scooters, Bikes



# MR E-Mobility – Acceptance Research

- Evaluate Customer Acceptance of EV
- Acceptance of Mobility concepts/Infrast. Solutions
- Business Models
- Promotion mechanisms
- Questionnaires/Interviews
  - EV Users
  - Experts
  - Interest groups
  - Field tests (IT solutions)



# Outlook – National E-Mobility Platform

	<b>F1: 2009-2011 Market Preparation</b>	<b>F1: 2012-2015 Penetration</b>	<b>F3:2017-2020 Market Volume</b>
Batteries, condensers	R&D Li-Ion Batteries (1, 2G)	Demo/Field tests (1,2G) Production (mass, initial)	Production (Mass) R&D other alternat.
Car technology	PHEV/BEV basis ICE R&D elec. Components Adaptation electric ICE	Small prod. PHEV/EV Series ready PHEV/EV R&D cost eff. Drives	Mass production High Power EV/PHEV
Infrastruc- ture	Test/simulat. Network Recharging stations RES-E <> E-Mobility	Expansion stations R&D Load Management Integration RES-E	Field tests real cond. Network/Car feed Fast charging /w-less
Frame conditions	Safety standards/DIN Policy framework	Promotion schemes ev.	
Market Develop.	Fleet tests	First private users Business model charging	1 Mio. EV Cars Lead market



# Further demonstrations



When washing machines talk to cars

If you want to sell electricity, drive a car.



Information policy, information society,  
telecommunications

ICT for Electric Mobility

100 Mio. € - BMWi - BMU

# Further demonstrations

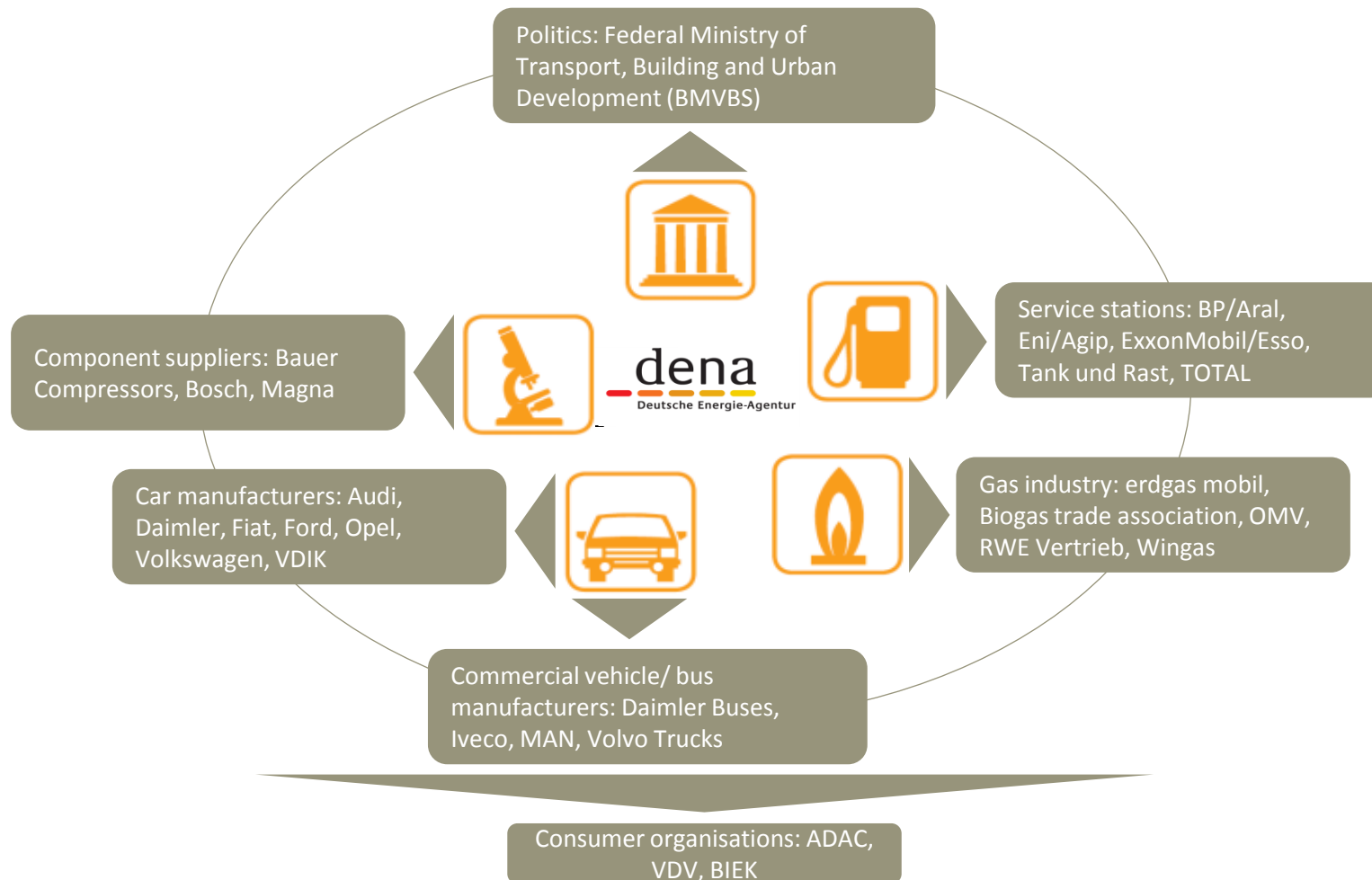
“The Federal Government is supporting an increase in the proportion of natural gas vehicles. It will investigate which measures can achieve an increase in the utilisation of biogas in the fuel sector.”

Source: Energiekonzept – für eine umweltschonende, zuverlässige und bezahlbare Energieversorgung [Energy Strategy – for an environmentally friendly, reliable and affordable energy supply]  
28 September 2010, p. 24.



# Further demonstrations

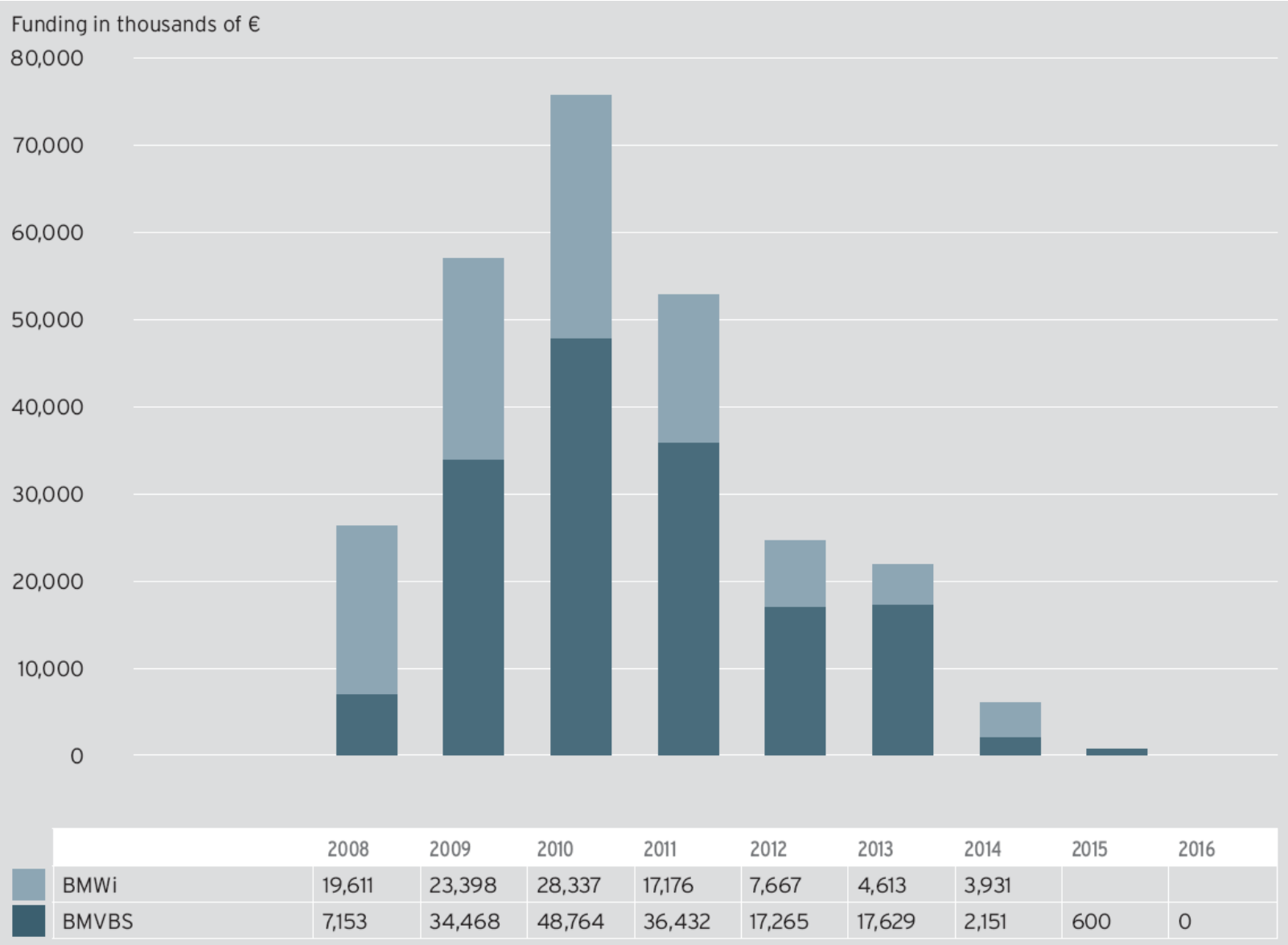
## Plan for Roadmap Process: Invitation of relevant actors



Thank you



# NIP – Source of funding



Source: NOW 2009