Electromobility in Germany: an Insight into Political Framework Conditions and Funding Programs

– Focus on the Federal Ministry for Transport (BMVI) –

1° Conferencia Vehiculos Inteligentes 2018 | Rio de Janeiro | 29. November 2018 |

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Introduction

NATIONAL ORGANISATION HYDROGEN AND FUEL CELL TECHNOLOGY (NOW)
GOVERNMENTAL PARTNER FOR SUSTAINABLE MOBILITY AND ENERGY

Battery Electric Mobility
- Research and Development
- Communal mobility concepts
- Vehicle procurement

Federal program Charging Infrastructure
- Nationwide buildup
- Normal charging
- Fast charging

National Innovation-program Hydrogen and Fuel Cell Technology
- Research and Development
- Market activation

Mobility and Fuels Strategy
- Alternative fuels (efficient, emission-free)
- LNG as a marine fuel
- Pilot projects

Export Initiative Environmental Technology
- German-Japanese cooperation PtG
- H2/FC technology in developing countries (cooperation with GIZ)

CHALLENGES AND TRENDS IN TRANSPORT AND MOBILITY (FROM A COMMUNAL/MUNICIPAL PERSPECTIVE):

- **growing communal and urban challenges**:
  - ✓ Urbanisation: transformation process, Megacities
  - ✓ Increase or decrease of population (major cities vs. rural areas
  - ✓ Ensuring Mobility: by increase of traffic volume and growing need for mobility at the same time
  - ✓ limited space and infrastructure capacities
  - ✓ Growing environmental requirements and regulations (e.g. EU law infringements or court judgements due to exceedance of nitrogen oxide limits)

- **growing potential for the realization of electromobility** (or other types of alternative drivetrains) especially in fleets (e.g. public and local transport, commercial fleets

Political Background

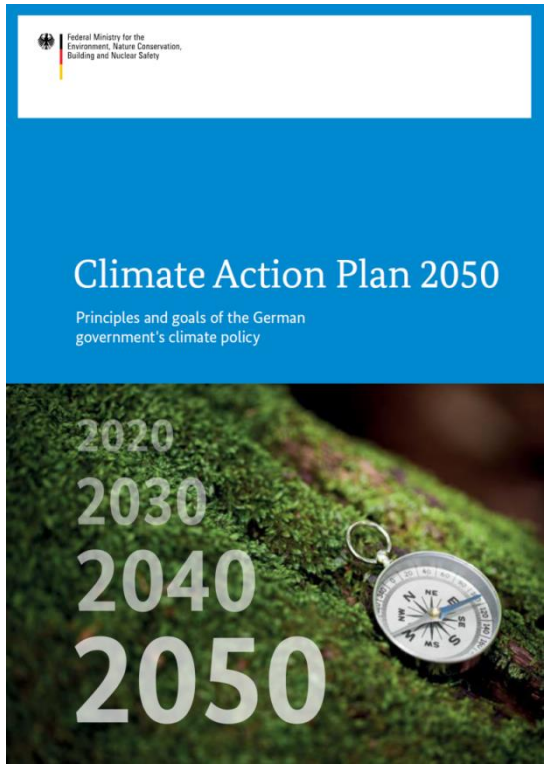
National Climate Action Plan with sector targets (2016)

Air Pollution Control

Market Activation Plan of the German Government (2016)

Electromobility Act (2015)

GERMAN CLIMATE ACTION PLAN 2050:
INTERNATIONAL AGREEMENTS POINT THE WAY FORWARD



Source: Federal Ministry for Environment, Climate Action Plan 2050, status 2018
https://www.bmu.de/fileadmin/Daten_BMU/Download_PDF/Klimaschutz/klimaschutzplan_2050_bf.pdf

Emissions from areas of action set out in definition of the target:

Area of action	1990 *(in million tonnes of CO_2 equivalent)*	2014 *(in million tonnes of CO_2 equivalent)*	2030 *(in million tonnes of CO_2 equivalent)*	2030 (reduction in % compared to 1990)
Energy sector	466	358	175 – 183	62 – 61 %
Buildings	209	119	70 – 72	67 – 66 %
Transport	163	160	95 – 98	42 – 40 %
Industry	283	181	140 – 143	51 – 49 %
Agriculture	88	72	58 – 61	34 – 31 %
Subtotal	1209	890	538 – 557	56 – 54 %
Other	39	12	5	87%
Total	**1248**	**902**	**543 – 562**	**56 – 55 %**

40 to 42 % of CO_2-emission reductions in the transport sector by 2030

POLITICAL FRAMEWORK
OBJECTIVES OF THE TRANSPORT SECTOR

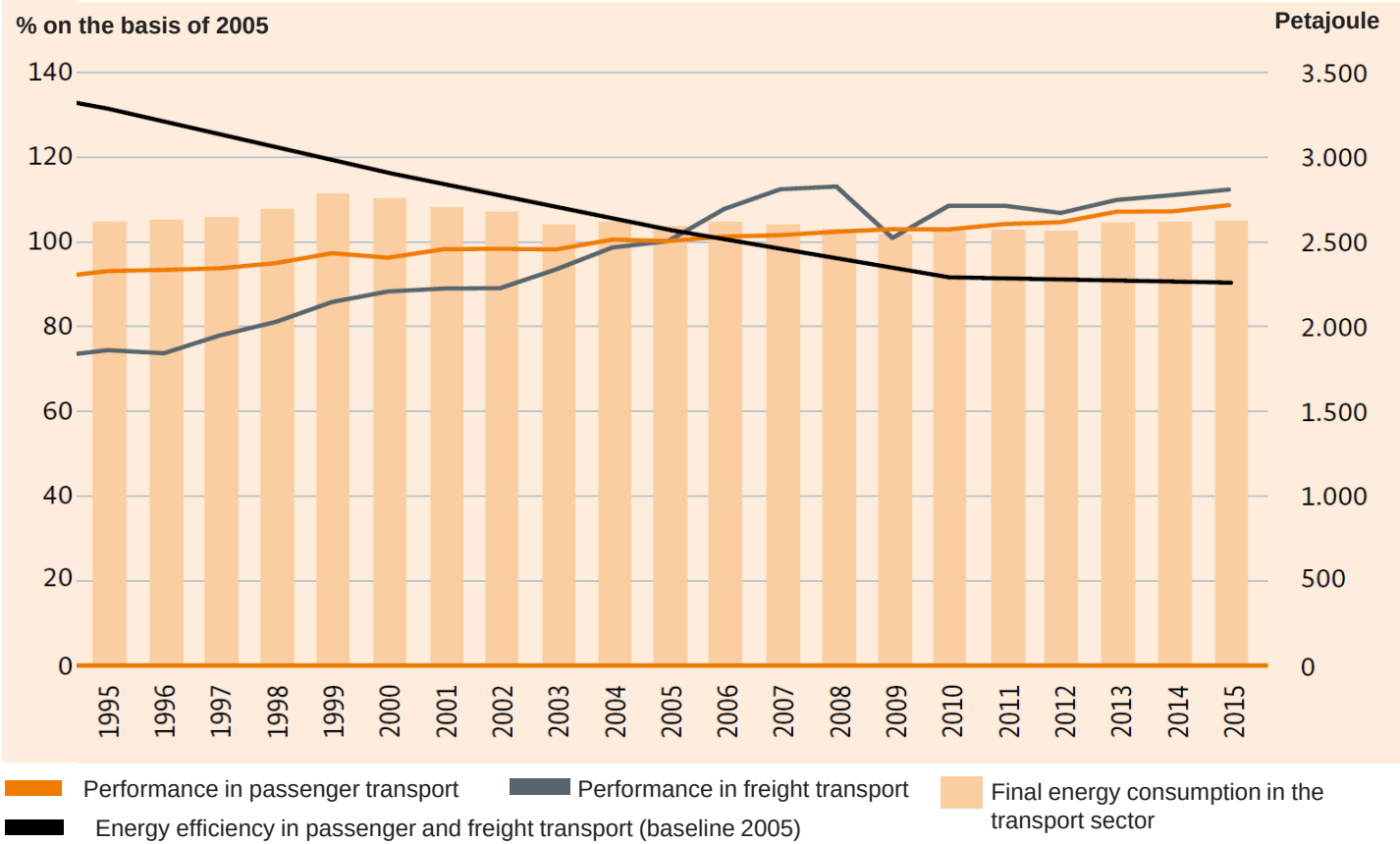
	2015	2020	2030	2040	2050
Total greenhouse gas emissions (compared to 1990)	-27 %	min. -40 %	min. -55 %	min. -70%	-80 % to -95 %
Greenhouse gas emissions traffic (compared to 1990)	0 %		min. -40 %		-80 % to -95 %
Final energy consumption Traffic (compared to 2005)	1,3 %	min. -10 %	→	→	-40 %

Energy of the Future: Fifth Monitoring Report on the Energiewende

Decarbonisation of the transport sector while reducing energy consumption

DEVELOPMENT OF THE TRANSPORT VOLUME

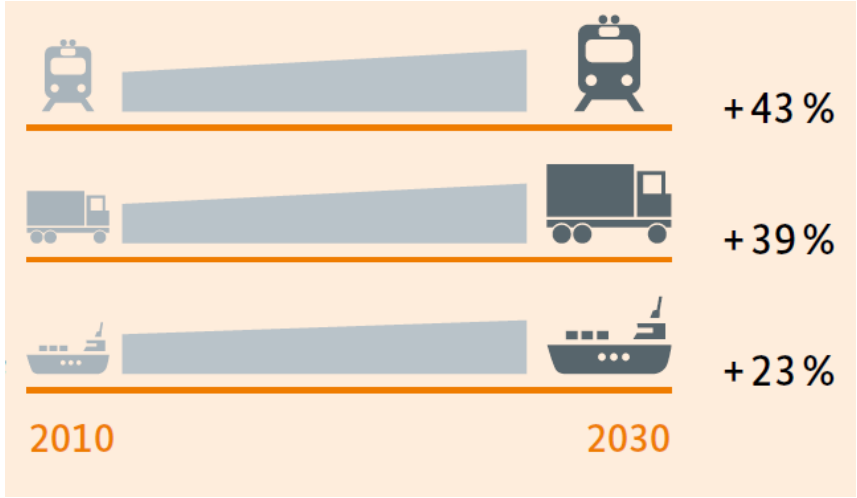
Development of the transport performance, energy efficiency and the absolute energy consumption in passenger and freight transport (1995-2015)



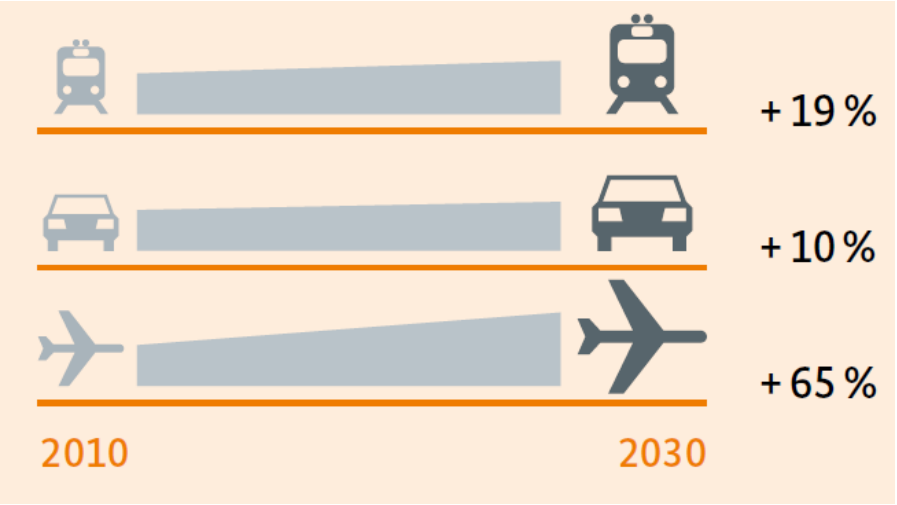
Source:
https://www.bmvi.de/SharedDocs/DE/Anlage/MFS/energie-auf-neuen-wegen.pdf?__blob=publicationFile

TRAFFIC FORECAST FOR 2030

Freight transport



Passenger transport

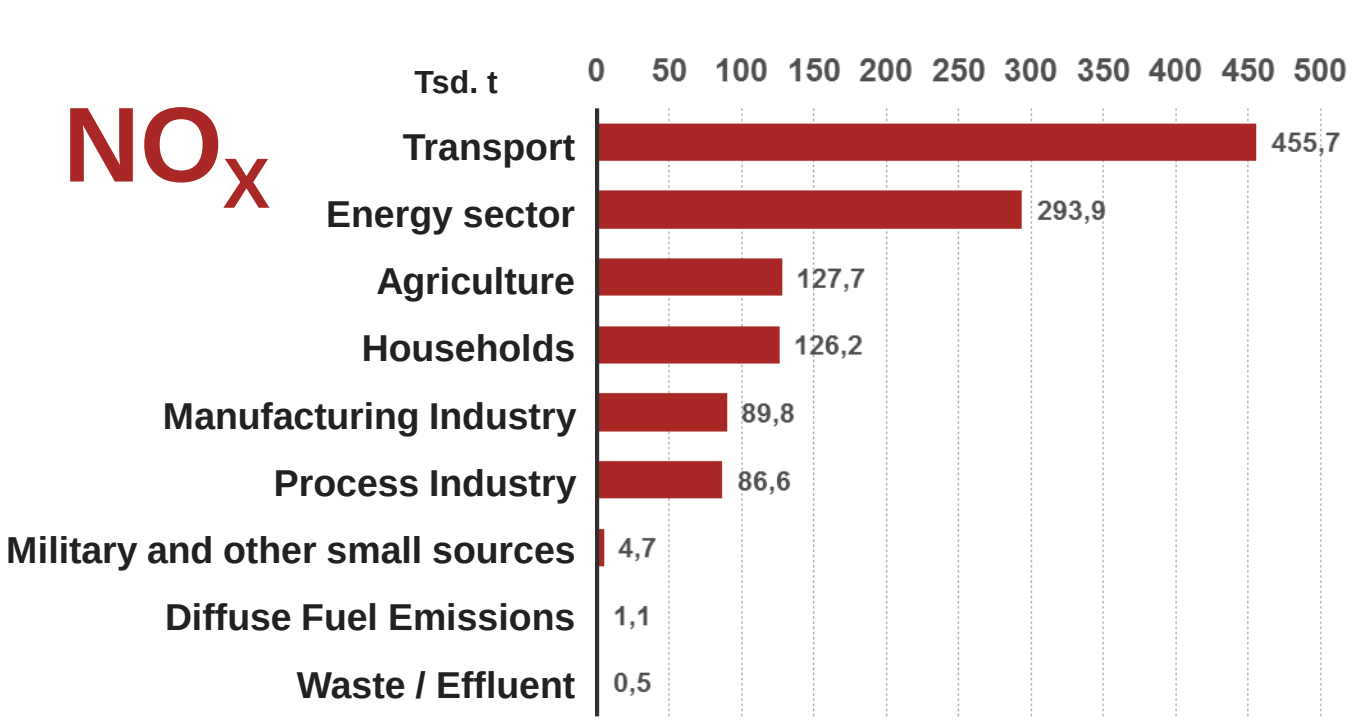


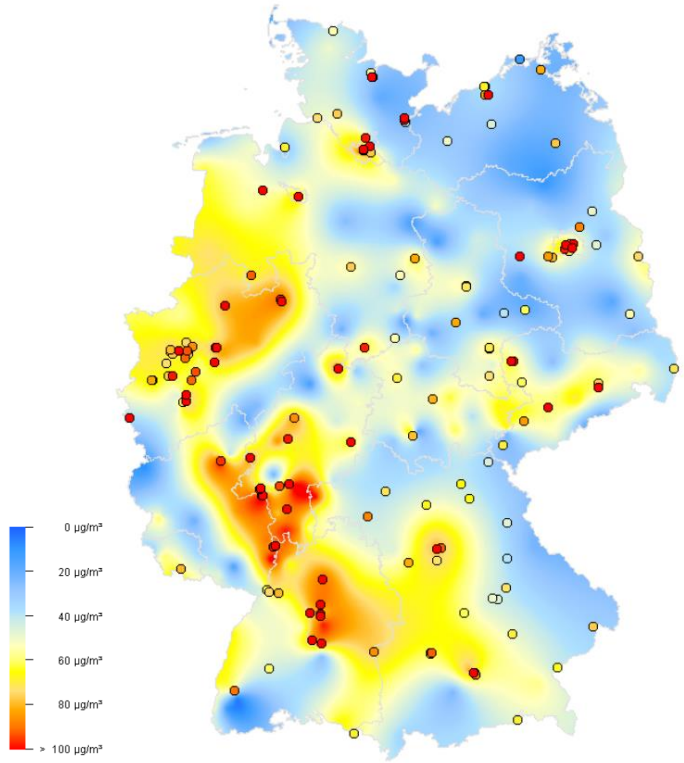
Source: https://www.bmvi.de/SharedDocs/DE/Anlage/MFS/energie-auf-neuen-wegen.pdf?__blob=publicationFile

Growth of 38 % in freight transport as well as 13% in passenger transport!

AIR POLLUTION CONTROL: TRANSPORT AND ENERGY SECTOR WITH RELEVANT SHARES, DIESEL ENGINES WITH HIGH PROPORTIONS

Need for action due to expected ECJ (EU Court of Justice) and national court rulings on communal driving bans for diesel vehicles





Sources: German Environment Agency, www.umweltbundesamt.de, 22.2.18 and 19.06.2018

ELECTROMOBILITY: AS CENTRAL COMPONENT TO MEET THE CLIMATE AND AIR QUALITY TARGETS

Political Targets

Climate Protection: Climate Action Plan 2050 (80 to 95% reduction of greenhouse gas emissions (in relation to 1990))
Emission reduction: reduction of nitrogen oxide emissions (Clean Air Action Program 2017)
Industry Policy: Governmental Program Electromobility (1 Mio. cars by 2020, market leader)

Core Technologies

- Battery (electric energy)
- Fuel Cell (Hydrogen)
- Plugin-Hybrids (as bridge technology)

Electromobility approach

- Fleet change into Evs
- Infrastructure build up
- Energy from renewable sources

MARKET ACTION PLAN OF THE GOVERNMENT:
OVERVIEW OF MARKET INCENTIVES FOR ELECTROMOBILITY (2016)

BUYER'S PREMIUM	PUBLIC CHARGING INFRASTRUCTURE	TAX INCENTIVES	PUBLIC FLEETS
▪ Private and commercial customers will receive a premium of €4,000 for BEV's and €3,000 for PHEV's ▪ The premium is shared 50/50 between industry and government ▪ Funding only aplicable for cars below €60,000 ▪ Total budget: €1.2 billion until 2019	▪ Total budget: 300 mio. € ▪ 200 mio. €: for fast charging infrastructure ▪ 100 mio.€ for low (normal) charging infrastructure ▪ Total number of charging units: 15.000 (5.000 DC, 10.000 AC)	▪ No taxation on electric power for charging at workplaces ▪ Extention of release of vehicle taxation for EVs to 10 years	▪ 20 % electric vehicles in the federal government fleet ▪ Overall investment costs of €100 million

ELECTROMOBILITY ACT (2015):
ELECTRIC VEHICLE CAN BE GIVEN PRIORITY IN THE TRAFFIC FLOW

- Definition privileged vehicles: BEVs, FCEVs and PHEVs

- Registration: Licence plates (domestic vehicles), Badges (foreign vehicles)

- Empowering communities
- Regulations on parking and stalling
  - Exemptions from or reductions on parking fees

- Use of special lanes
  - Bus lanes, taxi lanes etc.

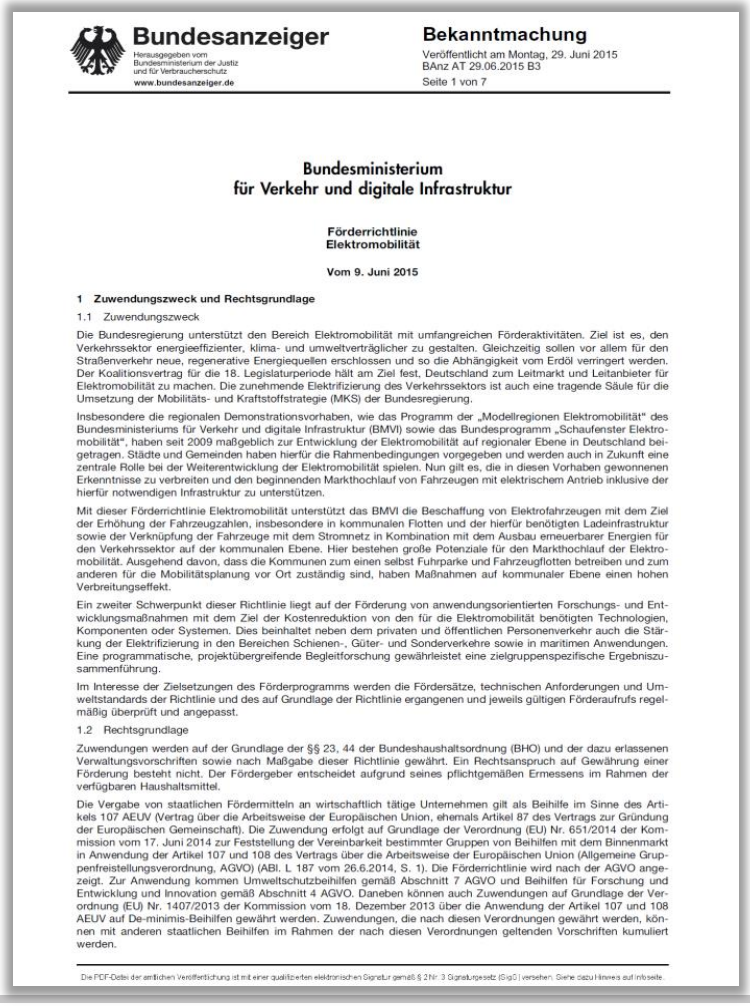
- Revocation of barriers of entry
  - Access to pedestrian zones, residential areas etc.

Funding Opportunities of the BMVI (coordinated by the NOW)

Electromobility Guideline (2015/2017)
Immediate Action Program for Clean Air in the Cities (2017)
Federal Program Charging Infrastructure (2017)
National Innovation Program Hydrogen and Fuel Cell Technology (2016, NIP Phase II)
Mobility and Fuel Strategy of the German Government

BMVI FUNDING GUIDELINE FOR ELECTROMOBILITY (2015/17)

CORNER STONES



Bundesanzeiger
Herausgegeben vom Bundesministerium der Justiz und für Verbraucherschutz
www.bundesanzeiger.de

Bekanntmachung
Veröffentlicht am Montag, 29. Juni 2015
BAnz AT 29.06.2015 B3
Seite 1 von 7

Bundesministerium für Verkehr und digitale Infrastruktur

Förderrichtlinie Elektromobilität

Vom 9. Juni 2015

1 Zuwendungszweck und Rechtsgrundlage

1.1 Zuwendungszweck

Die Bundesregierung unterstützt den Bereich Elektromobilität mit umfangreichen Förderaktivitäten. Ziel ist es, den Verkehrssektor energieeffizienter, klima- und umweltverträglicher zu gestalten. Gleichzeitig sollen vor allem für den Straßenverkehr neue, regenerative Energiequellen erschlossen und so die Abhängigkeit vom Erdöl verringert werden. Der Koalitionsvertrag für die 18. Legislaturperiode hält am Ziel fest, Deutschland zum Leitmarkt und Leitanbieter für Elektromobilität zu machen. Die zunehmende Elektrifizierung des Verkehrssektors ist auch eine tragende Säule für die Umsetzung der Mobilitäts- und Kraftstoffstrategie (MKS) der Bundesregierung.

Insbesondere die regionalen Demonstrationsvorhaben, wie das Programm der „Modellregionen Elektromobilität" des Bundesministeriums für Verkehr und digitale Infrastruktur (BMVI) sowie das Bundesprogramm „Schaufenster Elektromobilität", haben seit 2009 maßgeblich zur Entwicklung der Elektromobilität auf regionaler Ebene in Deutschland beigetragen. Städte und Gemeinden haben hierfür die Rahmenbedingungen vorgegeben und werden auch in Zukunft eine zentrale Rolle bei der Weiterentwicklung der Elektromobilität spielen. Nun gilt es, die in diesen Vorhaben gewonnenen Erkenntnisse zu verbreiten und den beginnenden Markthochlauf von Fahrzeugen mit elektrischem Antrieb inklusive der hierfür notwendigen Infrastruktur zu unterstützen.

Mit dieser Förderrichtlinie Elektromobilität unterstützt das BMVI die Beschaffung von Elektrofahrzeugen mit dem Ziel der Erhöhung der Fahrzeugzahlen, insbesondere in kommunalen Flotten und der hierfür benötigten Ladeinfrastruktur sowie der Verknüpfung der Fahrzeuge mit dem Stromnetz in Kombination mit dem Ausbau erneuerbarer Energien für den Verkehrssektor auf der kommunalen Ebene. Hier bestehen große Potenziale für den Markthochlauf der Elektromobilität. Ausgehend davon, dass die Kommunen zum einen selbst Fuhrparke und Fahrzeugflotten betreiben und zum anderen für die Mobilitätsplanung vor Ort zuständig sind, haben Maßnahmen auf kommunaler Ebene einen hohen Verbreitungseffekt.

Ein zweiter Schwerpunkt dieser Richtlinie liegt auf der Förderung von anwendungsorientierten Forschungs- und Entwicklungsmaßnahmen mit dem Ziel der Kostenreduktion von den für die Elektromobilität benötigten Technologien, Komponenten oder Systemen. Dies beinhaltet neben dem privaten und öffentlichen Personenverkehr auch die Stärkung der Elektrifizierung in den Bereichen Schienen-, Güter- und Sonderverkehre sowie in maritimen Anwendungen. Eine programmatische, projektübergreifende Begleitforschung gewährleistet eine zielgruppenspezifische Ergebniszusammenführung.

Im Interesse der Zielsetzungen des Förderprogramms werden die Fördersätze, technischen Anforderungen und Umweltstandards der Richtlinie und des auf Grundlage der Richtlinie ergangenen und jeweils gültigen Förderaufrufs regelmäßig überprüft und angepasst.

1.2 Rechtsgrundlage

Zuwendungen werden auf der Grundlage der §§ 23, 44 der Bundeshaushaltsordnung (BHO) und der dazu erlassenen Verwaltungsvorschriften sowie nach Maßgabe dieser Richtlinie gewährt. Ein Rechtsanspruch auf Gewährung einer Förderung besteht nicht. Der Fördergeber entscheidet aufgrund seines pflichtgemäßen Ermessens im Rahmen der verfügbaren Haushaltsmittel.

Die Vergabe von staatlichen Fördermitteln an wirtschaftlich tätige Unternehmen gilt als Beihilfe im Sinne des Artikels 107 AEUV (Vertrag über die Arbeitsweise der Europäischen Union, ehemals Artikel 87 des Vertrags zur Gründung der Europäischen Gemeinschaft). Die Zuwendung erfolgt auf Grundlage der Verordnung (EU) Nr. 651/2014 der Kommission vom 17. Juni 2014 zur Feststellung der Vereinbarkeit bestimmter Gruppen von Beihilfen mit dem Binnenmarkt in Anwendung der Artikel 107 und 108 des Vertrags über die Arbeitsweise der Europäischen Union (Allgemeine Gruppenfreistellungsverordnung, AGVO) (ABl. L 187 vom 26.6.2014, S. 1). Die Förderrichtlinie wird nach der AGVO angezeigt. Zur Anwendung kommen Umweltschutzbeihilfen gemäß Abschnitt 7 AGVO und Beihilfen für Forschung und Entwicklung und Innovation gemäß Abschnitt 4 AGVO. Daneben können auch Zuwendungen auf Grundlage der Verordnung (EU) Nr. 1407/2013 der Kommission vom 18. Dezember 2013 über die Anwendung der Artikel 107 und 108 AEUV auf De-minimis-Beihilfen gewährt werden. Zuwendungen, die nach diesen Verordnungen gewährt werden, können mit anderen staatlichen Beihilfen im Rahmen der nach diesen Verordnungen geltenden Vorschriften kumuliert werden.

Die PDF-Datei der amtlichen Veröffentlichung ist mit einer qualifizierten elektronischen Signatur gemäß § 2 Nr. 3 Signaturgesetz (SigG) versehen. Siehe dazu Hinweis auf Infoseite.

- Duration: 09/06/2015 till 31/12/2020
- Total budget: approx. €250 million
- Objective: increase of the number of electric vehicles in the context of market ramp-up (special focus on communal/municipal fleets)
- Technologies eligible to receive funding (defined by the Electromobility Act):
  - Rechargeable electric vehicles according to the German Electromobility Act (*EMoG*)
  - PHEVs with an electric range of >50km
  - Medium duty vehicles (N2 and N3)
  - Battery Buses (M2 and M3), no hybrid buses

ELECTRO MOBILITY FUNDING GUIDELINE (2015 – 2020):
PROCUREMENT, CONCEPTS AND R&D

PROCUREMENT
EV & Charging Infrastructure

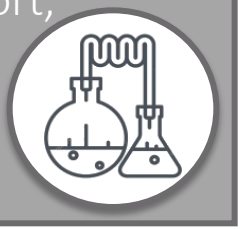
- Fleets of at least 5 (commercial) or min. 3 vehicles (communes) & respective charging infrastructure
- Approx. 2.350 EV & 620 charging stations granted in 3 calls
- 4th call in planning

CONCEPTS
Communal E-Mobility Concepts

- Studies on technical and economic feasibility, on the overal sytem integration of electro-mobility
- Target group: communal and regional sustainability initiatives
- 129 applications approved in 3 calls
- 4th call in planning

RESEARCH & DEVELOPMENT
Support for Market Ramp-Up

- Innovative charging technologies
- Interaction of vehicle and charging infrastructure
- Integration of Renewable Energies
- Electrification of public and business transport and of goods
- Special modes of transport, maritime applications



IMMEDIATE ACTION PROGRAM FOR CLEAN AIR
FROM FEDERAL GOVERNMENT
GOAL: INPUT FOR SHORT-TERM AIR IMPROVEMENTS IN CITIES

Electrification of urban commercial fleets
- FG Electromobility (BMVI)
- FG Renewable transport (BMUB)
- Further FG preparation (BMUB)

Electrification of taxis, rental cars and carsharing
- FG Electromobility (BMVI)
- FG Renewable transport (BMUB)

Electrification of busses in public transport
- FG Electromobility (BMVI)
- FG e-bus public transport (BMUB)

Modification of diesel busses in public transport
- Funding g. in preparation (BMVI)

Development of charging infrastructure
- FG Electro-Transport (Mobil) (BMWi)
- (FG Charging Infrastructur (BMVI))

Digitalisation of traffic
- FRL Digitalisation of communal traffic systems (BMVI)
- Further FG preparation (BMUB)

FG = funding guidline

Further Information:

- Budget up to 1 billion EUR for cites with NO2 problems, 750 Mio. EUR from the German Government

Funding amount of the program:

Action area	*Funding amount*
Electrification	393 M. Euro
Digitalisation	500 M. Euro
Modification of diesel busses	107 M. Euro

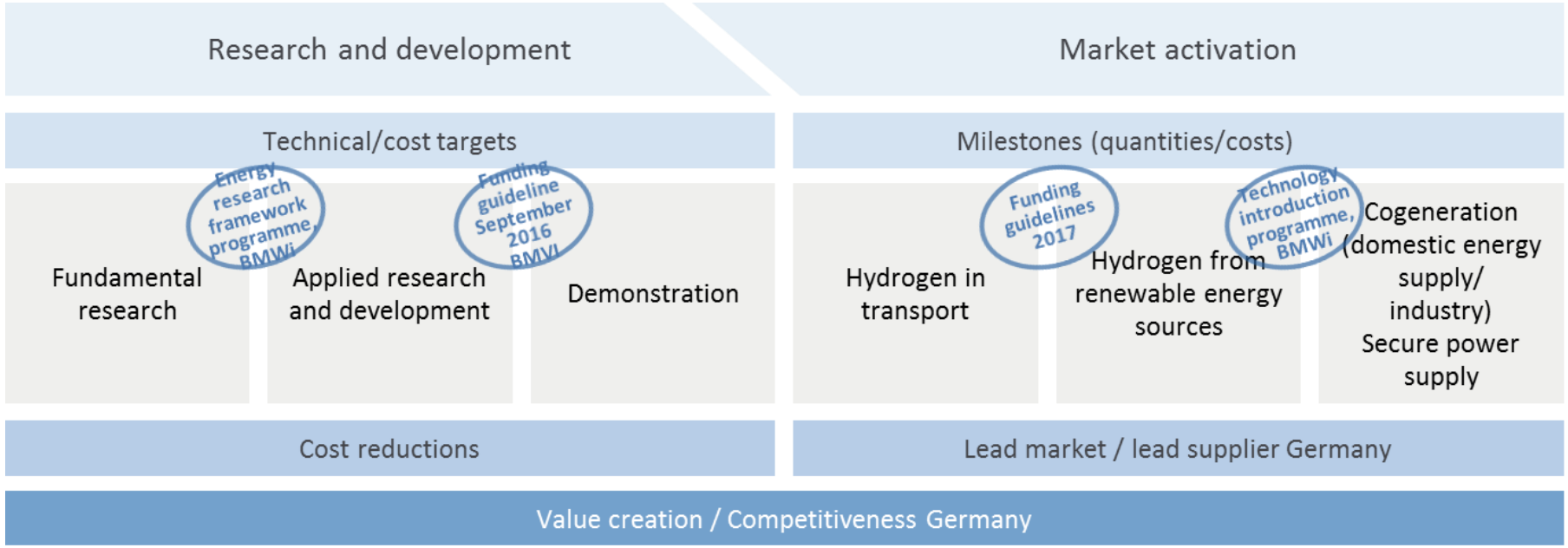
Info: www.bundesregierung.de/Webs/Breg/DE/Themen/Saubere-Luft/_node.html

FUNDING GUIDELINE OF THE FEDERAL PROGRAM CHARGING INFRASTRUCTURE (2017 – 2020)

- **Runtime: 2017 – 2020**
- **Budget**: **300 M € (min. 15,000 charging stations)**
  - 200 M € for fast charging (5,000 charging stations)
  - 100 Mio. € for normal charging (10,000 stations)
- Calls with varying specifications regarding
  - Funding amount
  - Location requirements
  - Additional technical standards
- Funding rates: max. 60% with caps depending on technology

More information at: https://www.now-gmbh.de/en/bundesfoerderung-ladeinfrastruktur

GOVERNMENT PROGRAM 2016 – 2026
CONTINUING THE NATIONAL INNOVATION PROGRAM (PHASE I)



Regierungsprogramm Wasserstoff- und Brennstoffzellentechnologie 2016-2026 – von der Marktvorbereitung zu wettbewerbsfähigen Produkten

zur Fortsetzung des Nationalen Innovationsprogramms Wasserstoff- und Brennstoffzellentechnologie 2006-2016 (NIP)

Ein gemeinsames Programm

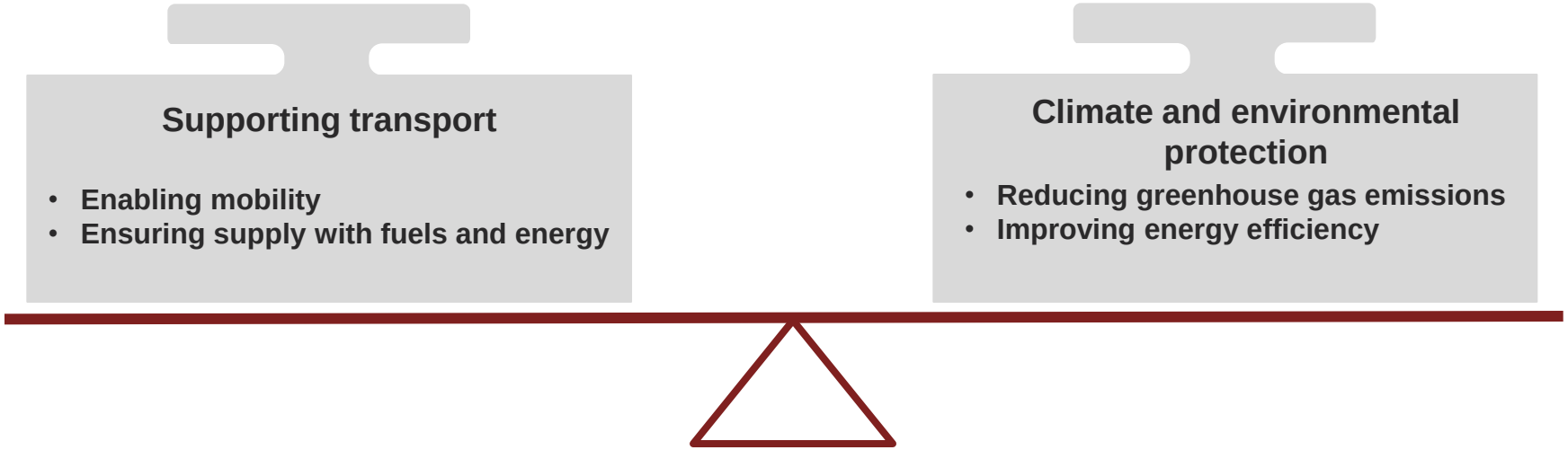
des Bundesministeriums für Verkehr und digitale Infrastruktur (BMVI),
des Bundesministeriums für Wirtschaft und Energie (BMWi),
des Bundesministeriums für Bildung und Forschung (BMBF) und
des Bundesministeriums für Umwelt, Naturschutz, Bau und Reaktorsicherheit (BMUB)

- 10 year program term (2016 – 2026)
- budget indications:
  - Industry € 2 bn
  - Federal funding € 1.4 bn
- Combining R&D funding with market activation

THE MOBILITY AND FUELS STRATEGY OF THE GERMAN GOVERNMENT (MFS): SETS THE STRATEGIC FRAMEWORK FOR THE ENERGY TRANSITION IN TRANSPORT

Central issues

1. How can we organize a more sustainable transport that is user-friendly at the same time?
2. How can alternative propulsions and fuels be used most efficiently for any application?



MFS: CREATES THE RIGHT FRAMEWORK AND ENABLES STUDIES AND PILOT PROJECTS ON KEY RESEARCH ISSUES (SELECTED STUDIES UND PROJECTS)

STUDIES

- Initiative for climate-friendly road freight transport
- Integated Energy Concept 2050
- Public transport by hybrid-trolleybuses (e.g. in Marburg and Trier)
- Measures supporting CNG/LNG
- Market readiness of natural gas motors (shipping)
- PTG-HEFA-hybrid refinery

PILOT PROJECTS

- CNG & LNG pilot projects on road transportation (Zippel and Meyer Logistics)
- LNG pilot projects on shipping (Wessels)
- LNG projects on federal shipping (ATAIR, customs ships)
- Pilot projects with hybrid-trolleybuses (in Solingen, Zwickau)
- Renewable kerosene at the Leipzig airport (Demo-SPK)

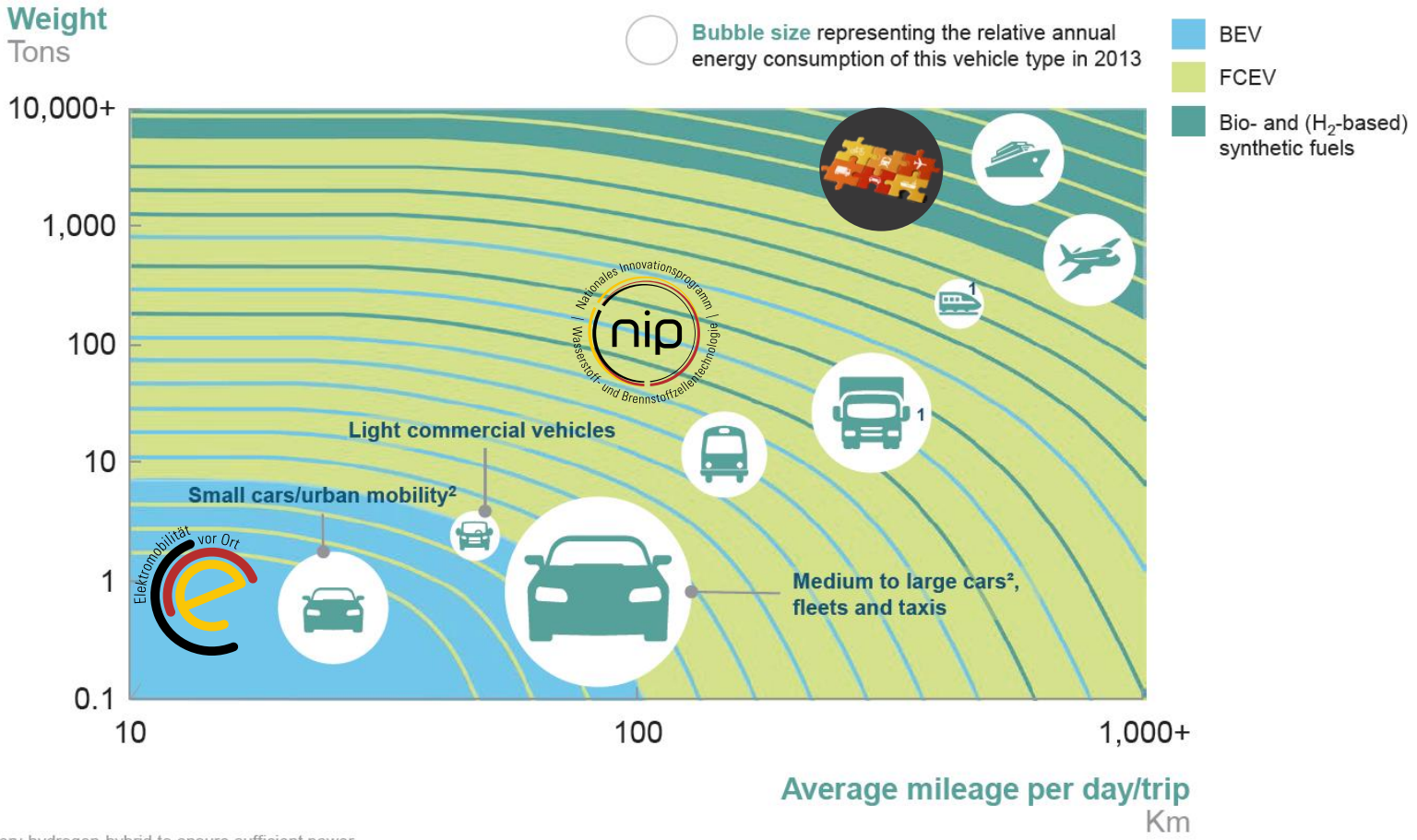
Status of Electromobility implementation in Germany

Overview of ongoing Funding Programs of BMVI (German Transport Ministry)

Market: Availability of vehicles and infrastructure, registration numbers

DECARBONIZING THE TRANSPORT SECTOR

OVERVIEW OF DRIVE TYPES AND ACCORDING FUNDING PROGRAMS



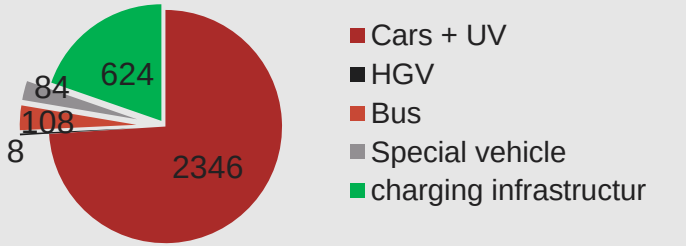
1 Battery-hydrogen hybrid to ensure sufficient power
2 Split in A- and B-segment LDVs (small cars) and C+-segment LDVs (medium to large cars) based on a 30% market share of A/B-segment cars and a 50% less energy demand

Source: Toyota, Hyundai, Daimler **Source**: http://hydrogeneurope.eu/wp-content/uploads/2017/01/20170109-HYDROGEN-COUNCIL-Vision-document-FINAL-HR.pdf

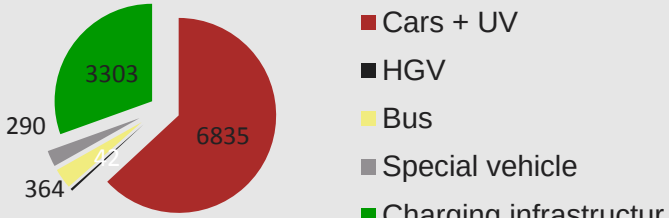
ELECTROMOBILITY FUNDING GUIDELINE (2015 – 2020):
FUNDING FIELDS (PROCUREMENT, CONCEPTS AND R&D)

PROCUREMENT
Electric vehicle & Recharging Infrastructure

Standard progam: Amount of procurement fund – 1-3. Calls

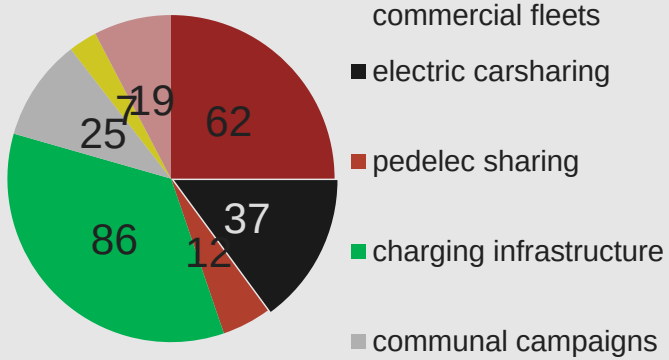


Program for clean air: Amount of procurement fund (Status: 15.11.2018)



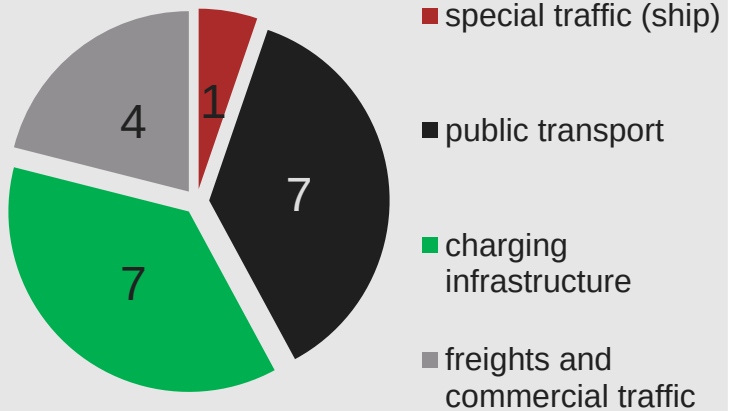
CONCEPTS
communal electromobility concepts

Concept main topics



RESEARCH& DEVELOPEMENT
To support ramp-up phase

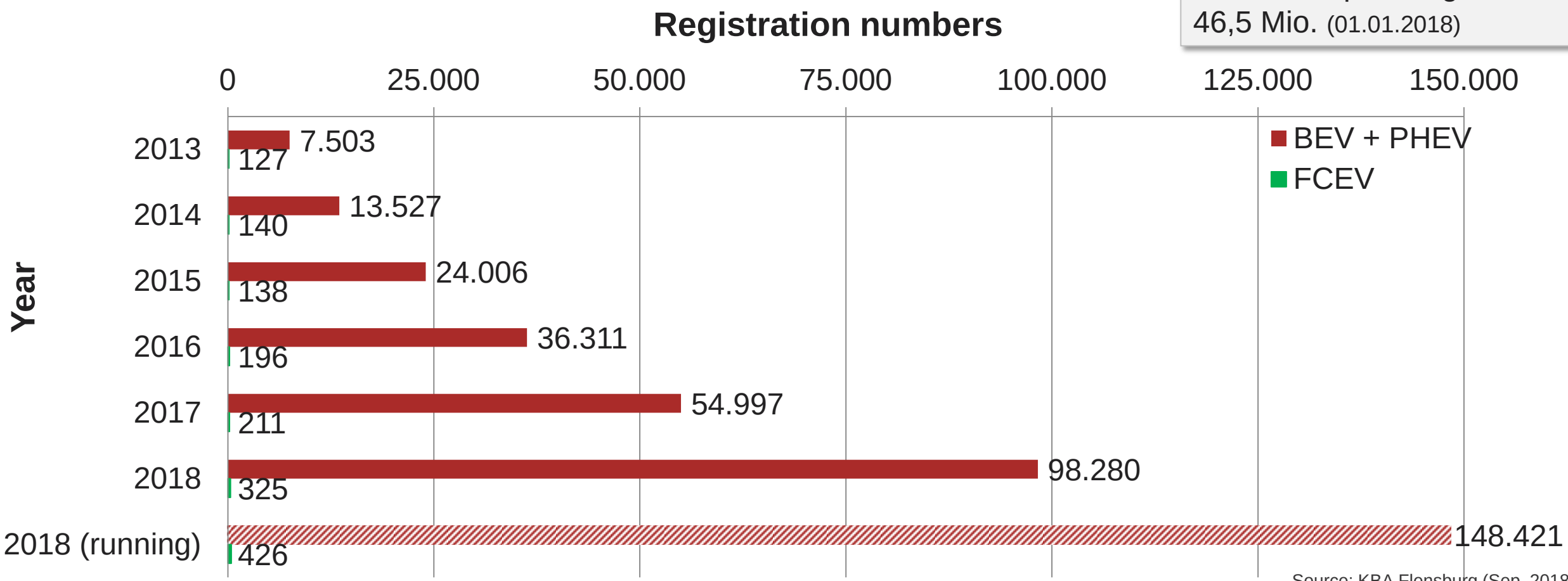
Amount of current R&D projects



E-Mobility MARKET RUN-UP in Germany

TOTAL NUMBER OF ELECTRIC PASSENGER CARS

Number of passenger cars:
46,5 Mio. (01.01.2018)



Source: KBA Flensburg (Sep. 2018)

MARKET RUN-UP

MODEL OVERVIEW OF BEV, PHEV AND FCEV

Small car

BMW i3
BMW MINI Countryman
Citroën C-ZERO
Smart EQ fortwo
Smart EQ forfour
Smart EQ fourtwoCabrio
Mitsubishi Electric Vehicle
Peugeot i-ON
Renault ZOE
VW e-up!
VW e-load up!

Compact class

Audi A3 Sportback e-tron
BMW 225xe Active Tourer
Ford Focus Electric
Ford C-Max Energi
Hyundai IONIQ Elektro
Hyundai IONIQ Plug-in-Hybrid
MB B 250e
Nissan Leaf
Nissan e-NV200 Evalia
Opel Ampera-e
Toyota Prius Plug-in-Hybrid
VW e-Golf
VW Golf GTE

Middle class

BMW 330e
BMW 530e
Kia Optima Sport-wagon Plug-in Hybrid
Kia Optima Plug-in Hybrid
MB C 350e Limousine
MB C 350e T-Modell
MB E 350e Limousine
VW Passat GTE Limousine
VW Passat GTE Variant
Volvo V60 D6 Twin Engine (Plug-in-Hybrid)
Volvo S90 T8 Twin Engine AWD (Plug-in-Hybrid)
Volvo V90 T8 Twin Engine AWD (Plug-in-Hybrid)

Upper class

BMW 740Le xDrive
BMW 740Le
BMW 740e
MB S560e
Porsche Panamera S E-Hybrid
Tesla Model S

SUVs

Audi Q7 e-tron
BMW X5 XDrive 40e
Citroën E-MEHARI
Hyundai ix35 Fuel Cell
Kia Soul EV
Kia Niro Plug-in-Hybrid
MB GLC FuelCell
MB GLC 350e
MB GLE 500e
Mitsubishi Outlander Plug-in-Hybrid
Porsche Cayenne S E-Hybrid
Tesla Model X
Volvo XC60 T8 Twin Engine AWD (Plug-in-Hybrid)
Volvo XC90 T8 Twin Engine AWD (Plug-in-Hybrid)

Vans

Citroën Berlingo Electric
Nissan e-NV200 Kastenwagen
Nissan e-NV200 Kombi
Peugeot Partner Electric
Renault Kangoo Z.E.
Renault Kangoo Maxi Z.E.

Light commercial vehicles

Streetscooter Work (B14)
Streetscooter Work (D16)

Sports car

BMW i8

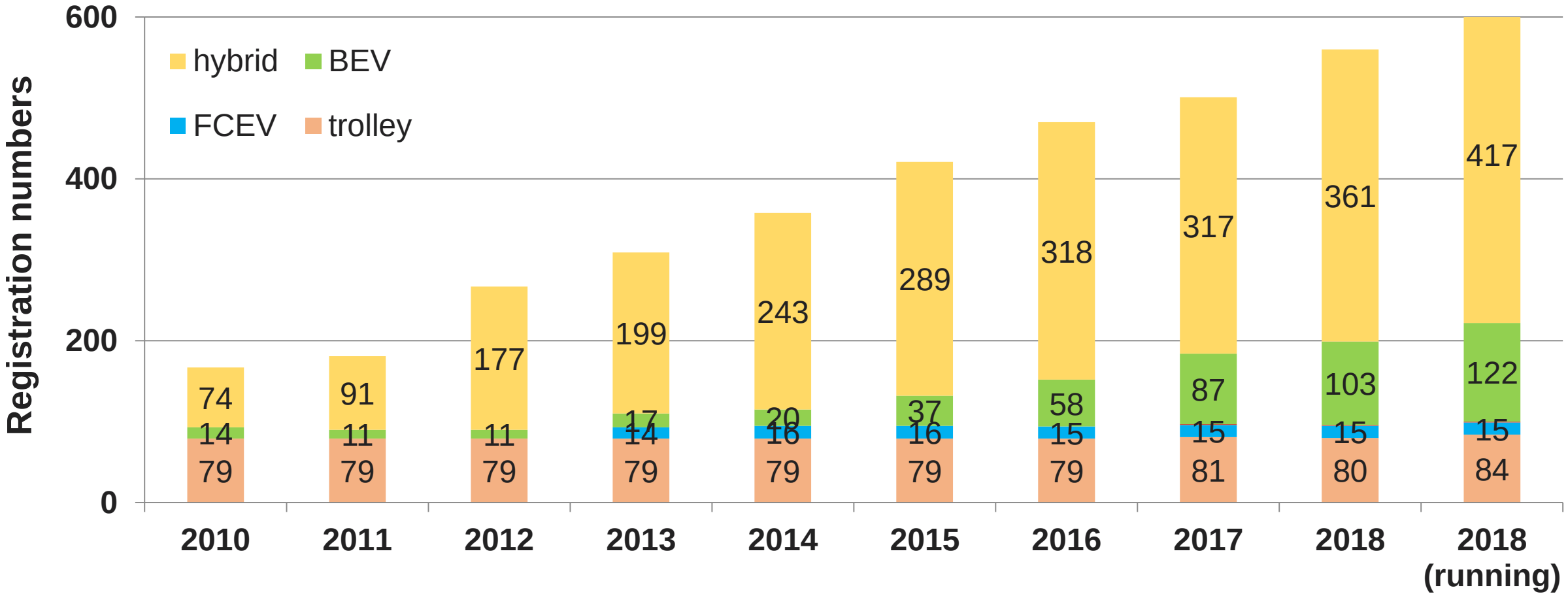
- **BEV:** 29 models
- **PHEV:** 34 models
- **FCEV:** 3 models

(Toyota Mirai is missing)

Source: NPE Progress Report 2018

MARKET RUN-UP

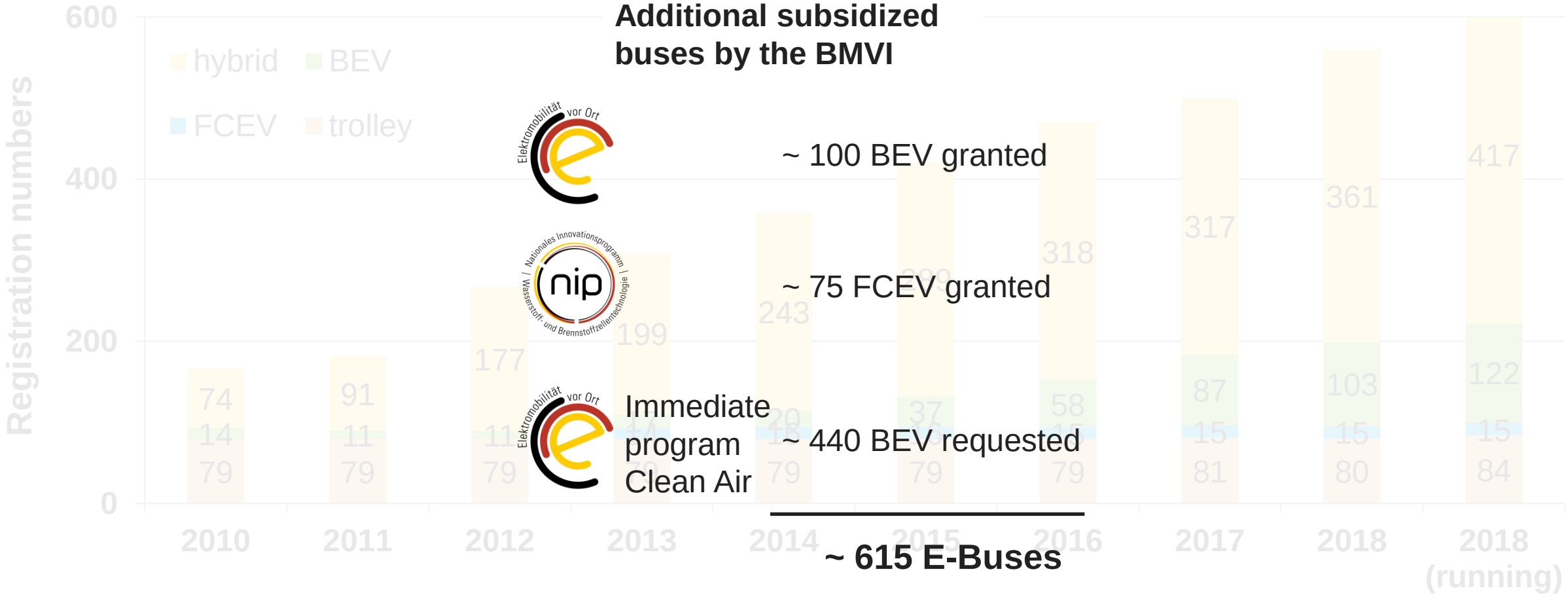
DEVELOPMENT OF E-BUS STOCK in Germany



Source: KBA, Sep. 2018

MARKET RUN-UP

DEVELOPMENT OF E-BUS STOCK within the next 2 years



Additional subsidized buses by the BMVI

~ 100 BEV granted

~ 75 FCEV granted

Immediate program Clean Air

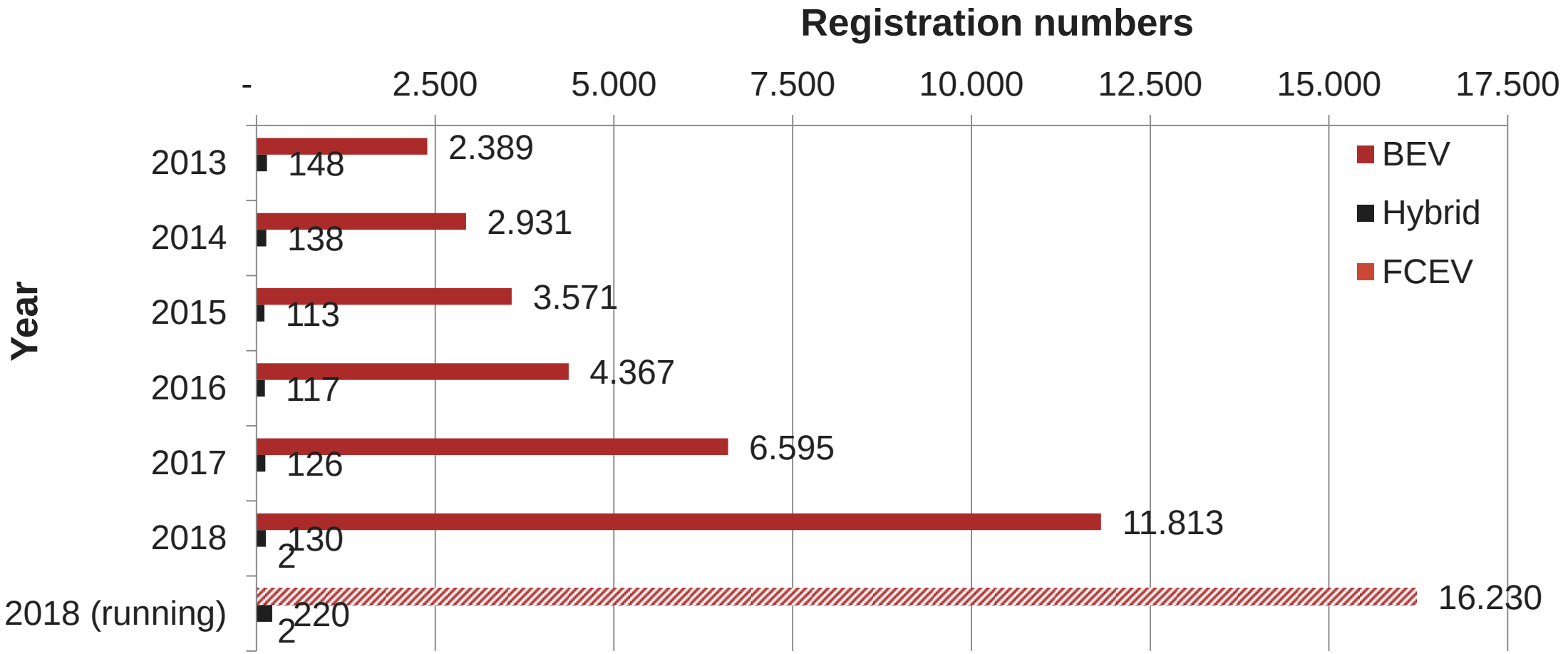
~ 440 BEV requested

~ 615 E-Buses

Source: KBA, Sep. 2018

MARKET RUN-UP

ELECTRO MOBILITY IN COMMERCIAL VEHICLE AND HEAVY DUTY SECTOR

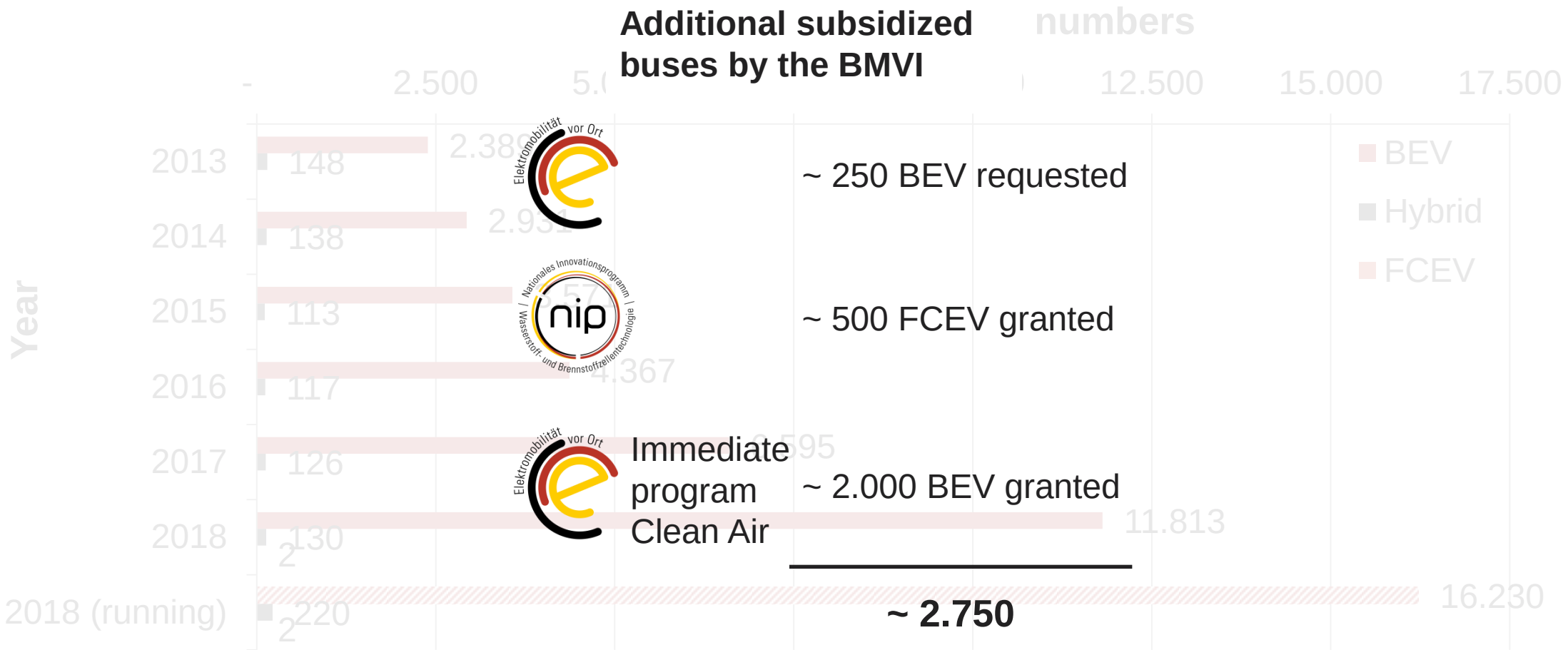


Source: KBA Flensburg (Sep. 2018)

MARKET RUN-UP

ELECTRO MOBILITY IN COMMERCIAL VEHICLE AND HEAVY DUTY SECTOR

Additional subsidized buses by the BMVI



~ 250 BEV requested

~ 500 FCEV granted

Immediate program Clean Air

~ 2.000 BEV granted

~ 2.750

Source: KBA Flensburg (Sep. 2018)

MARKET RUN-UP

RECHARGING AND HYDROGEN INFRASTRUCTURE FOR PASSENGER CARS

13.315 charging stations

thereof
3.897 fast and **19.579** normal charging points

Target 2020
7.000 fast and
36.000 normal charging points

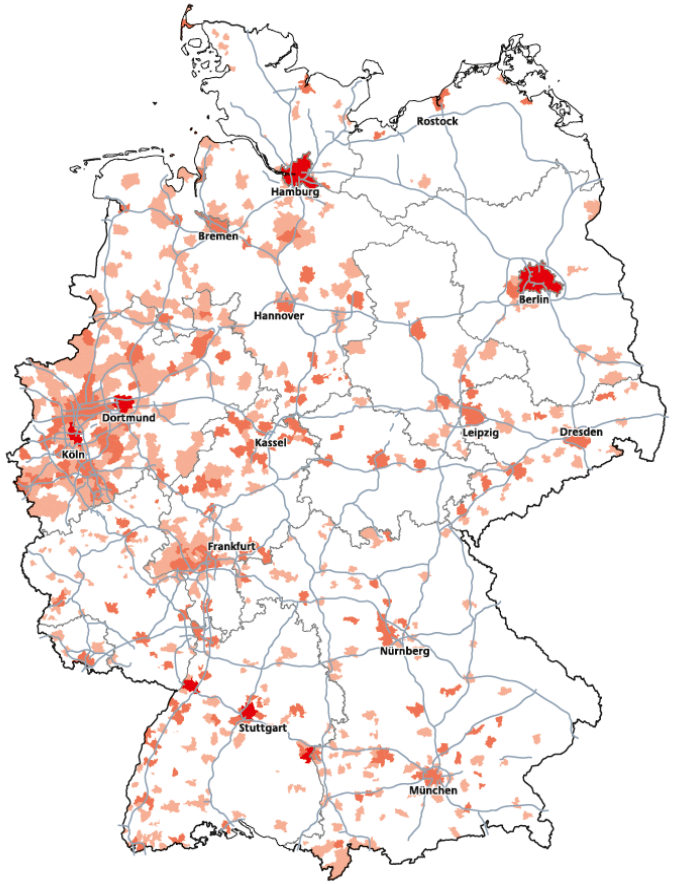


Image source: bdew

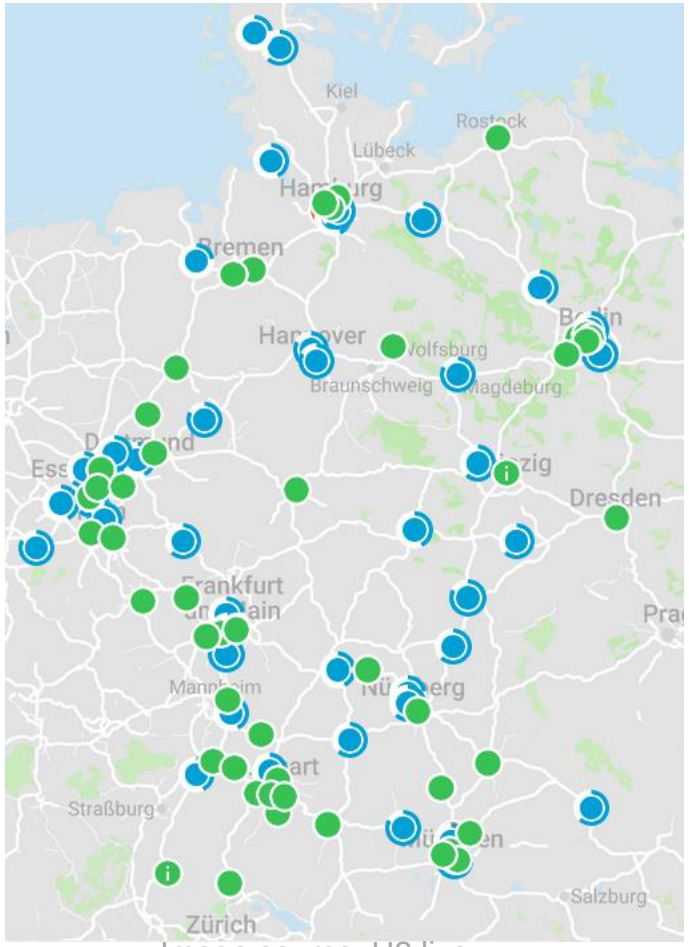


Image source: H2.live

700 bar

52 in operation

13 Commissioning and trial operation

Target 2023 **400**

H2 MOBILITY
FUELLING HYDROGEN

Challenges for further Market Ramp-up Recommendations for Action

Focus Germany

„NATIONAL PLATFORM ELECTROMOBILITY (NPE)“:
CURRENT STATUS REPORT FROM 19.9.18, STARTING SIGNAL OF THE „NATIONAL PLATFORM FUTURE OF MOBILITY (NPM)“

- *Current status* report submitted on 19.9.18
- *Key messages*:
  - Goal to become market leader with 1 Mio. electric vehicles is postponed to 2022
  - Announcement of german producers: 100 models till 2020

- *Recommendation for action to increase market ramp-up*:
  - Continue eco-bonus/ buyer‘s premium (funding for privat sector)
  - Uniformly and nationwide implementation of „electromobility law“
  - R&D requirements: High Power Charging, Battery (Development/ Improvement, Recycling, 2nd Use), System (integration and safety)
  - Funding action for commercial vehicles and buses
  - Active communication for the whole system

NATIONALE PLATTFORM ELEKTROMOBILITÄT

Fortschrittsbericht 2018 – Markthochlaufphase

Nationale Plattform Elektromobilität

Image Source: NPE Progress Report 2018, National Platform Electromobility, 09/2018

NPE PROGRESS REPORT 2018:
FORECAST FOR VEHICLE RAMP-UP TILL 2030 FROM A GERMAN PERSPECTIVE

- Exponential growth for EV demand worldwide
- 2020: 100 different car models from German manufacturers available
- 2022: market leader with 1 Mio. electric vehicles in Gerany
- 2025:
  - Total number of 2 to 3 Mio. vehicle in Germany (4-6,5% of new registrations)
  - Infrastructure demand: 130.000 to 190.000 public normal-CP and 13.000-19.000 public fast-CP
- 2030: total number of 4 to 7 Mio. vehicle in Germany (10-15% of new registrations)

NATIONALE PLATTFORM ELEKTROMOBILITÄT

Image Source: NPE Progress Report 2018, National Platform Electromobility, 09/2018

Summary & Conclusion

SUMMARY & CONCLUSION
TECHNOLOGY FOCUS

Challenge to reduce emissions in transport is high, targets are ambitious

Electromobility (battery and fuel cell) offers high efficiency as well as zero emissions with renewable energy

Public funding is necessary and available for different kinds of technologies and applications

SUMMARY & CONCLUSION
Fuel Cells and Batteries in Mobility Applications

- E-Mobility is a key to meeting the requirements of sustainable mobility in the future and is a key technology for decarbonising the transport sector.
- The market ramp-up has startet in many sectors: e.g. passenger cars, commercial vehicles and buses
- In the rail and heavy duty sector the market ramp-up is slowly starting. There is still a need for R+D (especially for the integration into the operational process).
- The funding programs of the BMVI helps to solve the open R+D needs as well as supports the market ramp-up
- The high demand for the programs confirms the right choice of instruments (R+D, market activation, master plans / concepts / studies)
- Electromobility is increasingly being used in Germany, it is visible and is being tested in practice.

Recommendations for market activation
Fuel Cells and Batteries in Mobility Applications

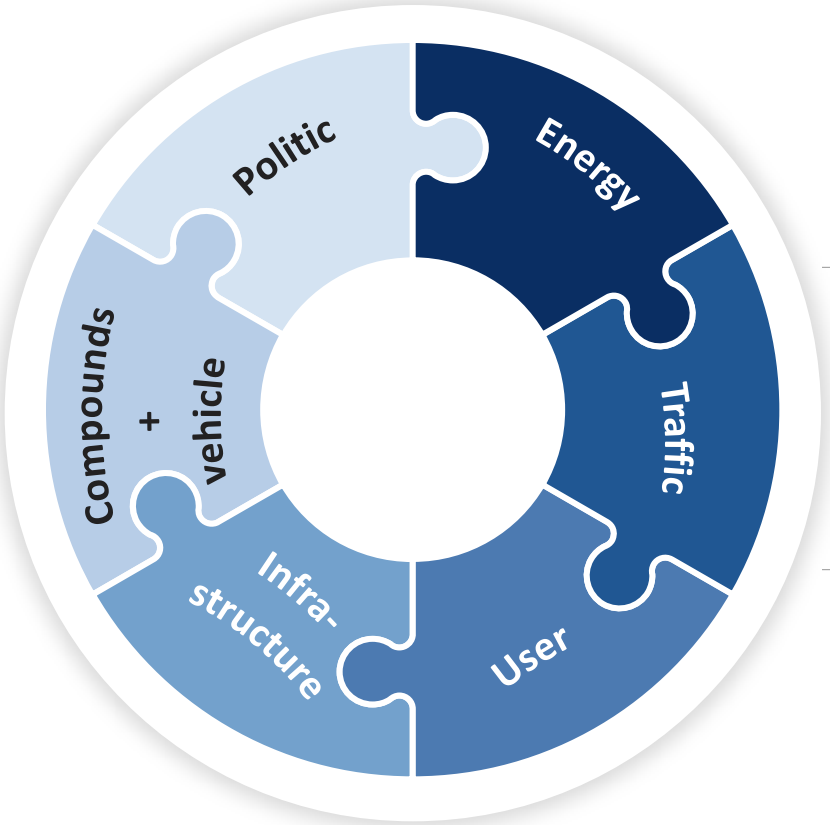
- **Strategic anchoring:** central responsibilities and regional networks are of particular importance (e.g. for the coordinated development of infrastructures for alternative fuels) and should be established and expanded locally.
- **Clear Definition of roles:** Municipalities are central actors in the context of the mobility and traffic turnaround and are confronted with a multitude of challenges.
- **Funding Programs I:** Funding of research and demonstration of practicability are important in certain areas of application: e.g. rail, bus, commercial vehicles.
- **Funding Programs II:** Investment funding programs are suitable for broader market ramp-up.
- **Infrastructure:** simultaneous, high demand for coordinated nationwide infrastructure build-up for alternative drives

ELECTRO MOBILITY IS PART OF THE WHOLE SYSTEM:
6 SENSIBLE INTEGRATED PUZZLE PARTS ARE IN CHARGE OF AN SUCCESSFUL MARKET RAMP-UP

Policy
Suitably framework (long-term, obligatory), e. g. funding programs

Vehicle + Components
Ongoing R&D (efficiency improvement, battery develpment)

Charging Infrastructure
coordinated and nationwide development



Energy system
Energy system transformation in all sectors

Transport system
Utilisation of efficiency potentials, Integration of renewable energy, Decarbonization of the transport sector

Operators and Users
Consideration of known user requirements acceptance, demand

Thank you!

Oliver Braune

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