E-Mobility in Sustainable Urban Development


GRIHA Summit
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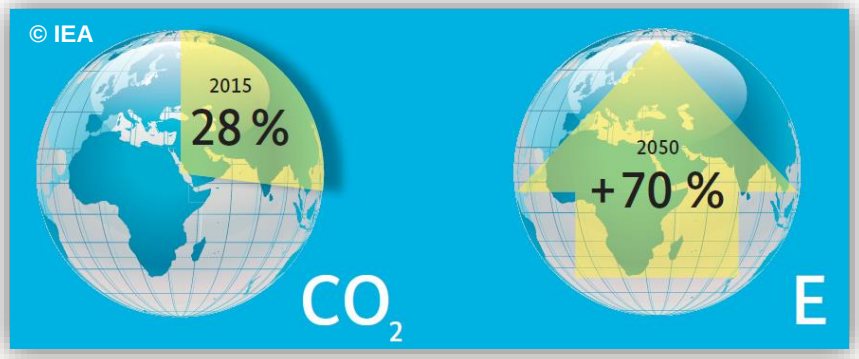
Importance of e-mobility for SDG11

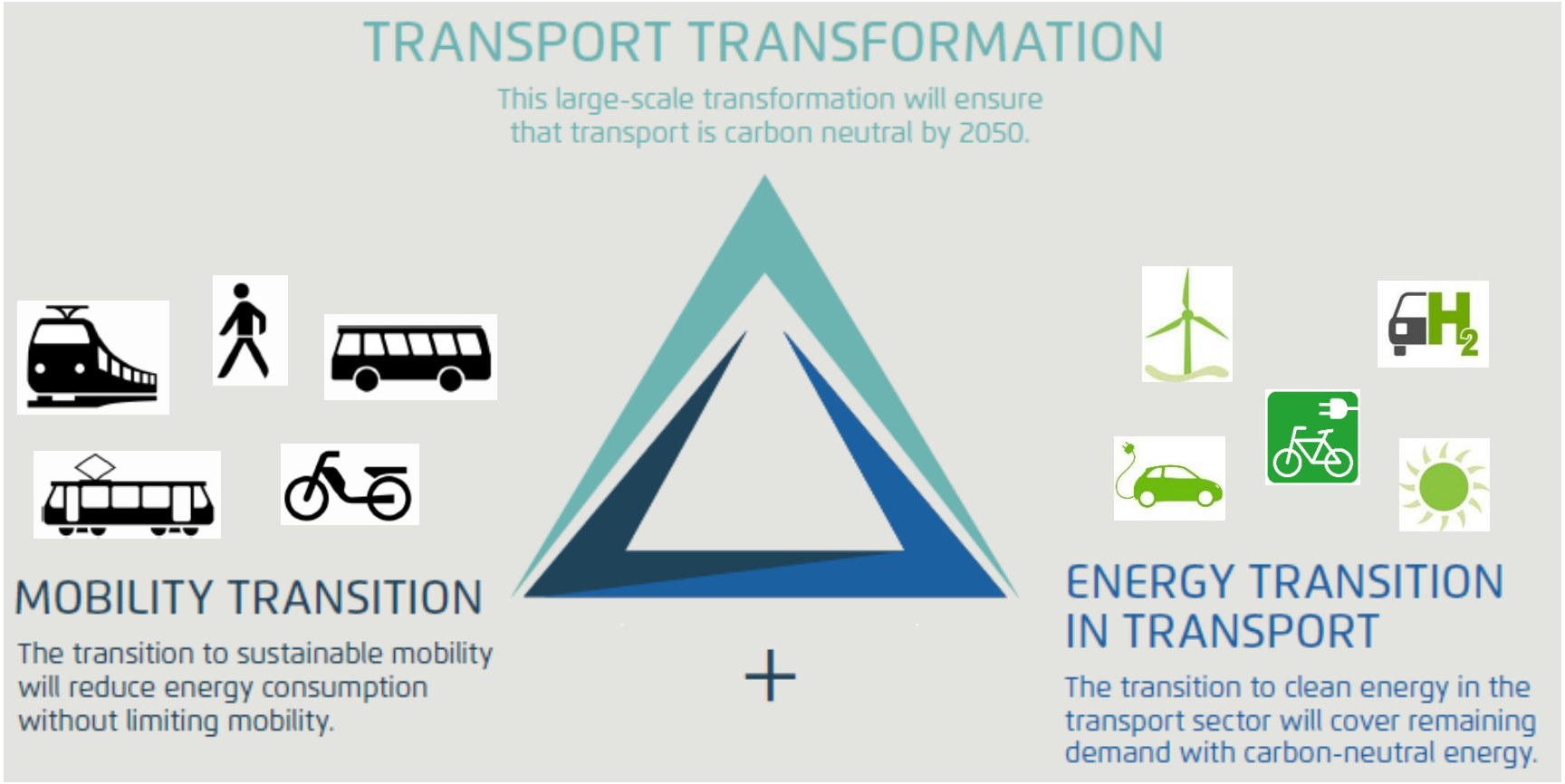
Motorization, air quality, traffic noise

Energy dependency and trade deficits



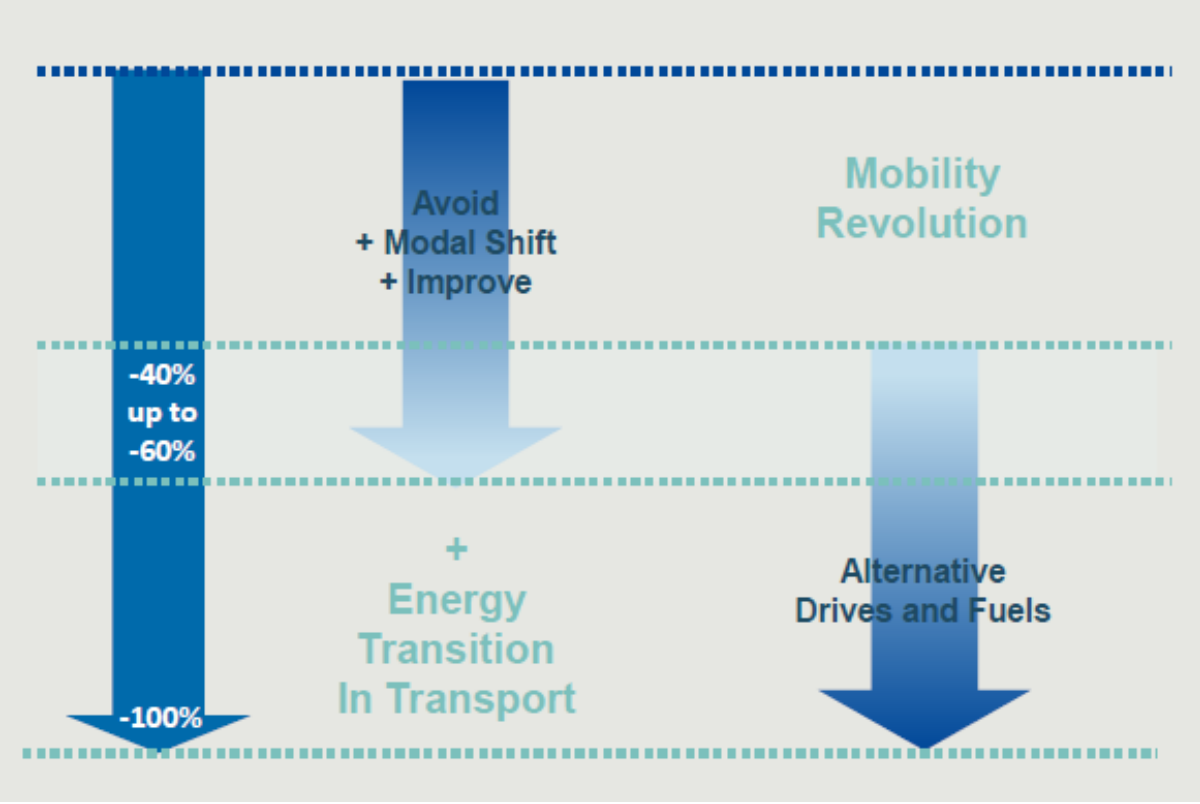
Energy consumption and GHG emissions

E-mobility is one of several pieces towards decarbonization



Source: Agora Verkehrswende

It requires both mobility transition and energy transition in transport



GHG reductions by more than 60% can only be reached with the energy transition in transport

Source: Agora Verkehrswende

Cities are key for EV adoption!

Challenges on urban level

- Rapid motorization
- Traffic jams
- Air pollution
- Roadway noise
- Loss of street space for NMT, green places, etc.
- Safety issues

Chances for e-mobility on urban level

- Lower distances
- Efficiency benefits
- Economical benefits
- Available regulatory instruments
- Concentration of innovation driver
- New business models

Areas of implementation

rail/ tram

private cars

governmental/
company/
tourism fleets

public transport

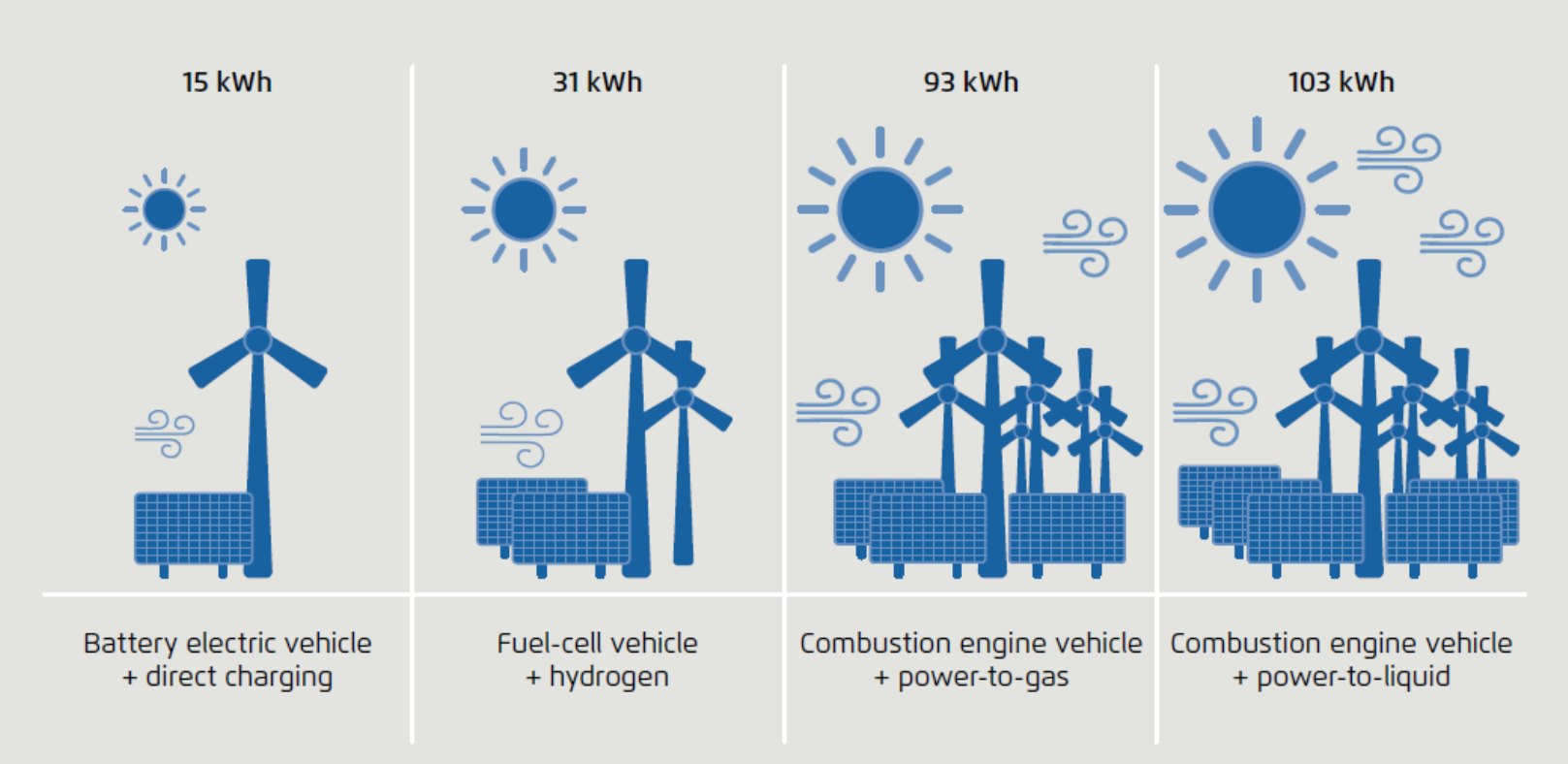
two-wheelers

three-wheelers

x-sharing/ taxi/
ridehailing

urban freight

Amount of renewable energy required for various powertrain and fuel combinations (per 100 km)



Source: Agora Verkehrswende, based on calculations by DLR, Ifeu, LBST, DFZ (2015)

Consequences for the transport sector, example public transport provider

Challenges	Opportunities
• High upfront costs (vehicles and infrastructure) • Challenging operation • New ways to procure (requirements on vehicles, equipment, operation services) • Standardization and interoperability • Reinforcing cooperation with energy provider • …	• Higher energy efficiency • Less running and maintenance costs • Renewal of operation systems can lead to more efficiency (e.g. routes, frequency) • Attractive vehicles might attract more people to public transport • Less GHG emissions, air pollutants and noise • …

Consequences for the energy sector

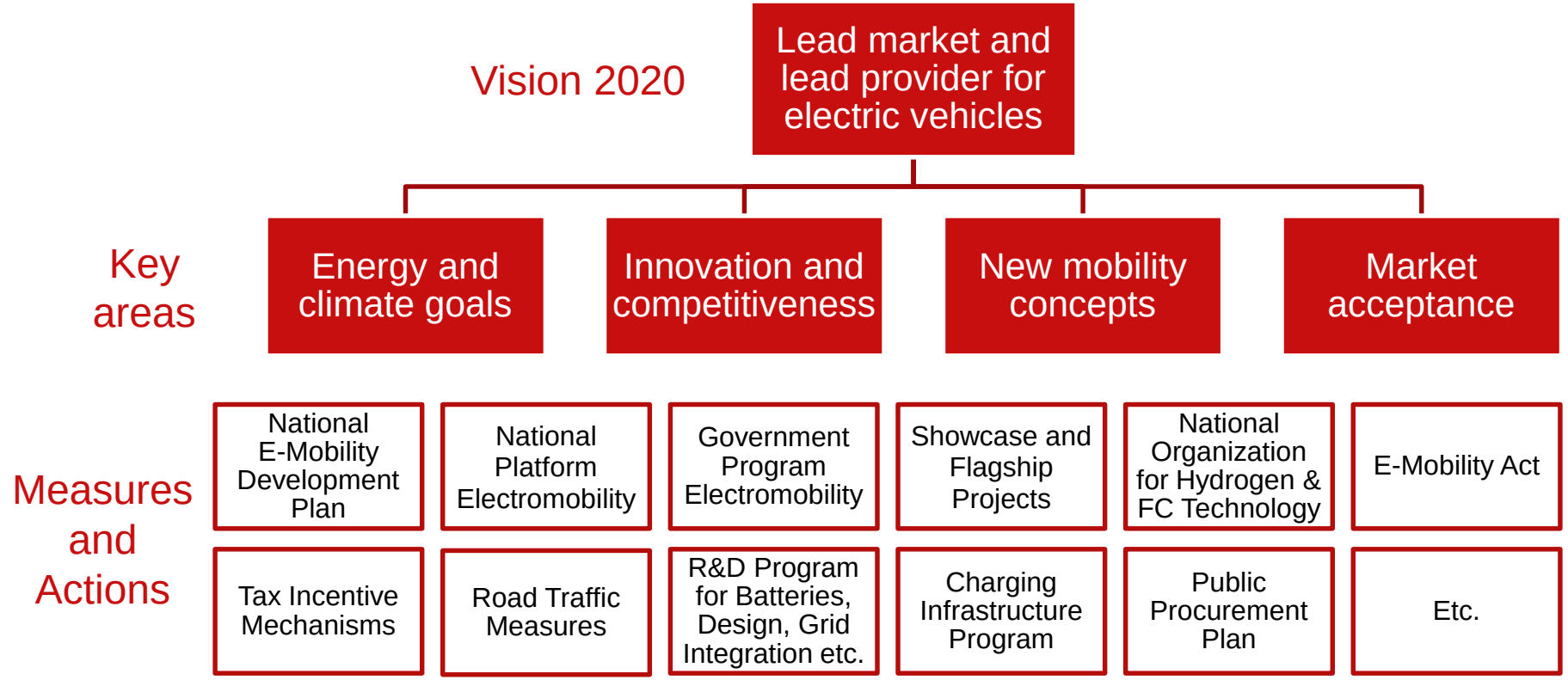
Challenges

- Development of charging infrastructure (location finding, technical, economical and legal requirements)
- Increasing electricity demand
- Uncontrolled charging can lead to problems in distribution grids
- Dependency on charging behaviour of the user (difference between desire and reality)
- Billing of charging current
- …

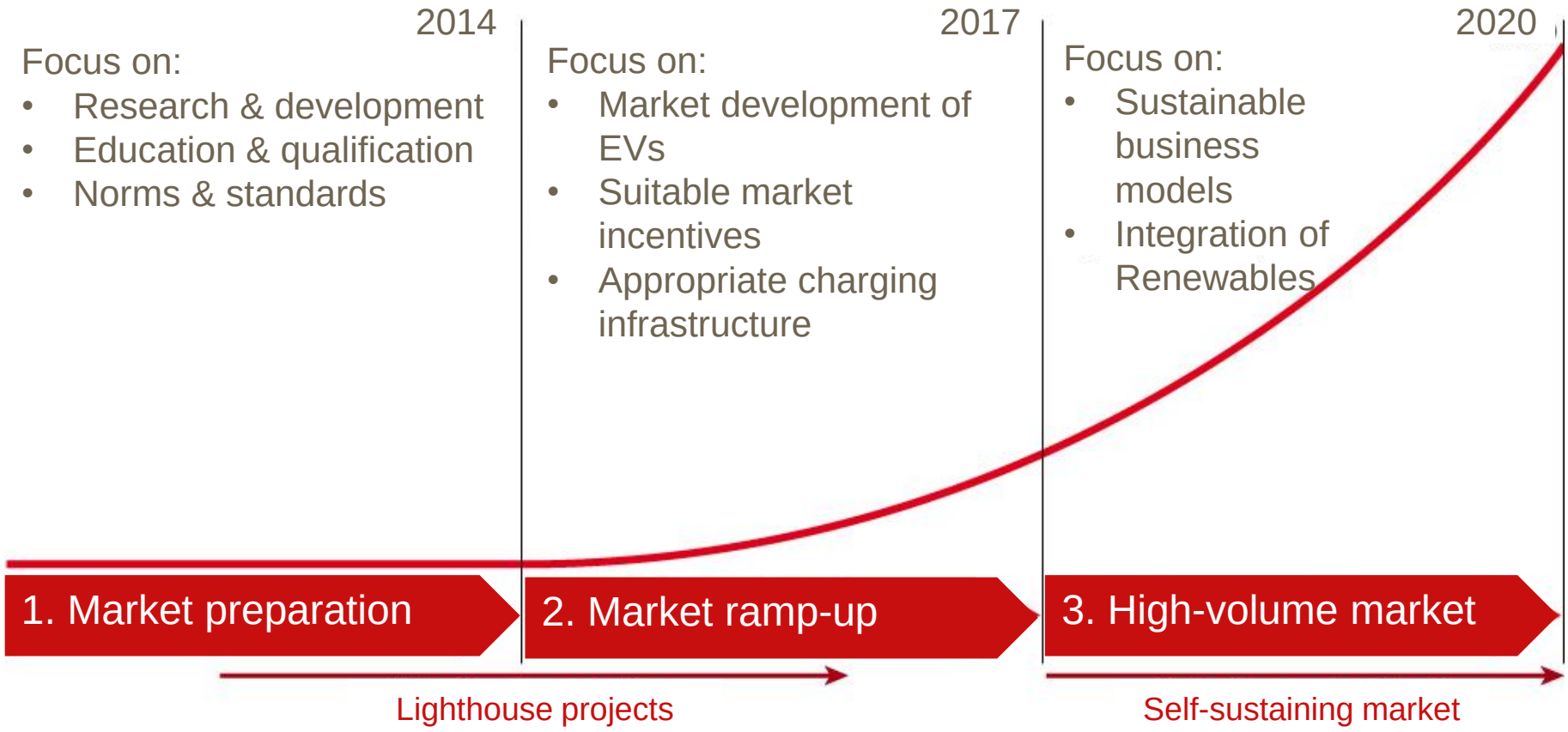
Opportunities

- Use of EVs for grid integration and storage of renewable energy (reducing load peaks, alternative to network expansion)
- Decentralised production, control and storage is becoming cheaper and smarter
- Energy security/ reduction of oil import dependency (price stability)
- Re-use of mobile batteries for stationary operations
- New business models
- …

E-Mobility in Germany: Visions and actions



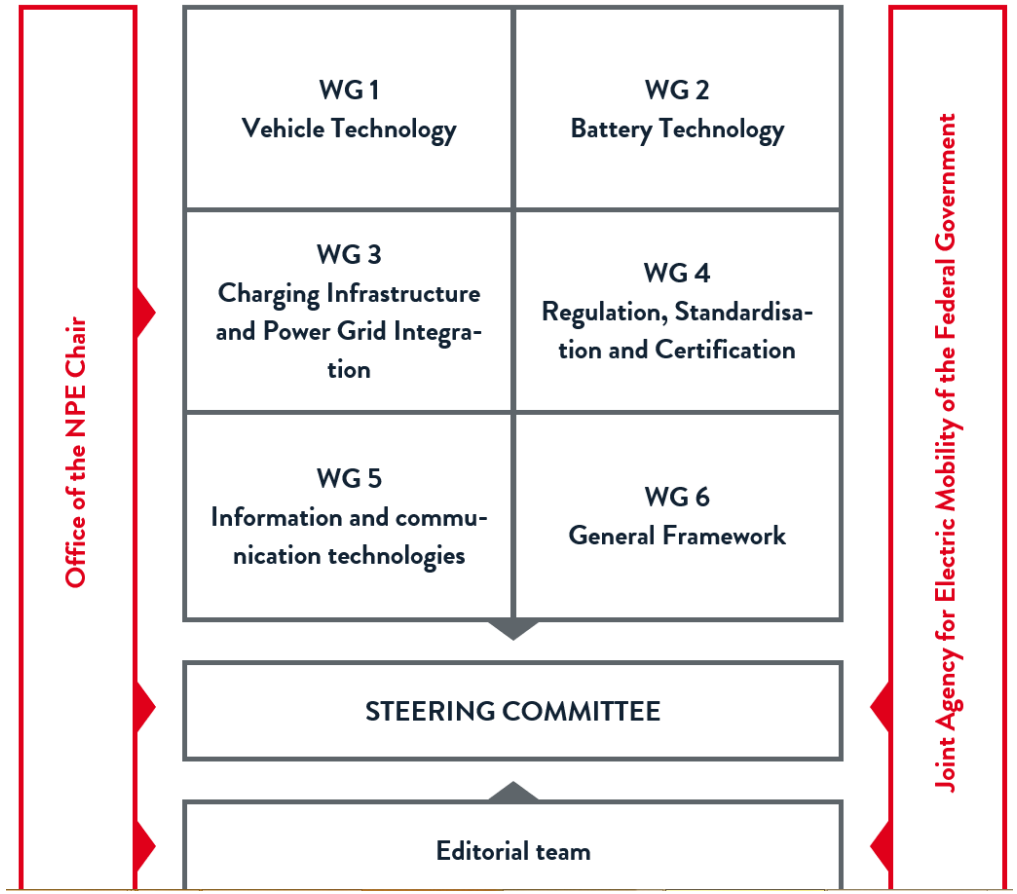
E-Mobility in Germany: Road Map



Germany founded National platform on e-mobility NPE

150 representatives from industry, science, politics, trade unions and trade associations are advising government for strategic dialogue

http://nationale-plattform-elektromobilitaet.de/en/the-npe/organisation/



GoI initiated electric mobility from a sustainability and an energy security point of view with an aim of saving $ 330 Bn in energy costs and 1 gigatonne of carbon emissions by 2030

Alternative Fuels for Surface Transportation Programme by the Ministry of New and Renewable Energy

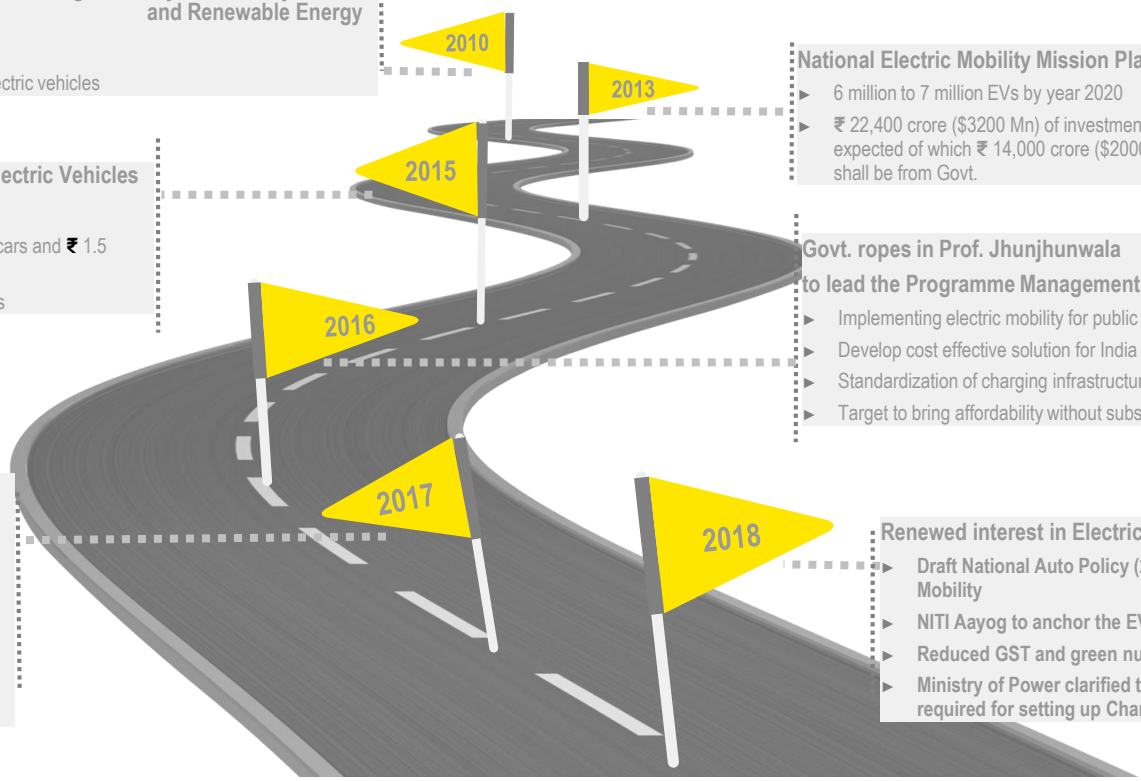
- Incentive package worth ₹ 95 crore ($13.6 Mn)
- Incentives of 20% on the ex-factory prices of electric vehicles

Faster Adoption and Manufacturing of Electric Vehicles

- Initial outlay of ₹ 75 crores ($10.7 Mn)
- Purchase incentives of ₹ 1.38 Lacs ($2000) for cars and ₹ 1.5 crores ($0.2 Mn) for Buses
- Subsidy for establishing R&D and testing centres

Govt. intends to go all electic by 2030

- Taxes on hybrid raised to 43%
- EESL tenders for 10k EVs for govt fleet
- ₹ 437 crores ($62.5 Mn) of subsidy allotted by DHI under remaining corpus of FAME scheme to 11 cities to procure 390 e-Buses, 370 e-cars and 720 e-three wheelers
- Karnataka becomes the first state launch an EV policy



National Electric Mobility Mission Plan 2020

- 6 million to 7 million EVs by year 2020
- ₹ 22,400 crore ($3200 Mn) of investments expected of which ₹ 14,000 crore ($2000 Mn) shall be from Govt.

Govt. ropes in Prof. Jhunjhunwala to lead the Programme Management Cell

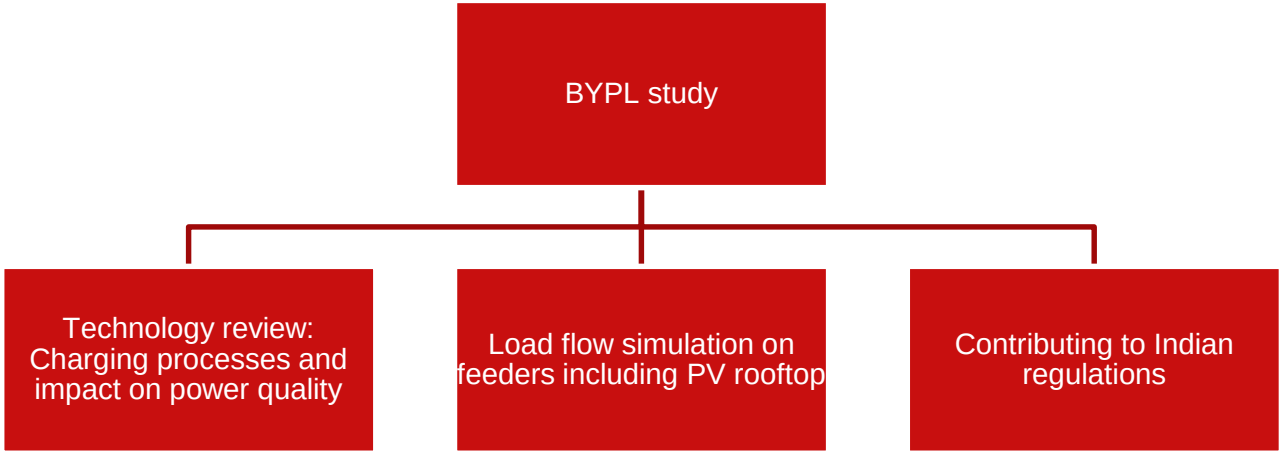
- Implementing electric mobility for public transport
- Develop cost effective solution for India
- Standardization of charging infrastructure specifications
- Target to bring affordability without subsidy

Renewed interest in Electric mobility

- Draft National Auto Policy (2016-26) to promote Green Mobility
- NITI Aayog to anchor the EV roadmap for India
- Reduced GST and green number plates for EVs
- Ministry of Power clarified that no license will be required for setting up Charging Infrastructure

Source: News articles; http://www.niti.gov.in/writereaddata/files/document_publication/Lighthouse%20City%20Grand%20Challenge%20Vf.pdf

Impact assessment of large scale integration of Electric Vehicle Charging infrastructure in the electricity distribution system



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NDC Transport Initiative for Asia

An upcoming regional programme under the International Climate Initiative

On behalf of:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

of the Federal Republic of Germany

NDC Transport Initiative for Asia (2019-2023)

Identifying pathways & targets	Implementation of actions	Scaling and outreach
India Component: Consolidating transport strategies and EV policies.		**Global & Asia Component:**
1.1: Identifying transport targets and mitigation pathways	1.2: Implementing electro-mobility powered by RE	Further countries enhance ambition in transport
China Component: Integrating low-carbon and clean air strategies.		4.1: Studies and toolkits inform decision-maker
2.1: Long-term transport policy-package for a Chinese province	2.2: Vehicle-related GHG & pollutant emissions regulations	4.2: Regional dialogue puts transport on the agenda
Vietnam Component: Increasing transport ambition in the NDC.		4.3: Global awareness for high ambition in transport
3.1: Monitoring & enhancing transport targets in climate strategies	3.2: Design & implementation of clean transport policies	

Outcome: Asian countries put transport on a pathway towards decarbonisation.

India component

WP 1: Integrated decision-making for decarbonizing transport	WP 2: Electromobility powered by renewable energy
Output: Stakeholder engagement structure is established and informed by comprehensive quantitative analysis	Output: Policy and procurement frameworks for EVs & charging infrastructure have been improved
Activities: • Stakeholder dialogue • Data & modelling • Technical support to inform stakeholder dialogue	Activities: • Charging infrastructure uptake • EV supply and demand side policies • EV business models

The consortium

- **GIZ (project coordinator):** Service provider on international cooperation for sustainable development. Track record on global and bi-lateral transport and climate change projects of BMU (e.g. TraCS and TRANSfer).
- **WRI:** Think tank with a track record on climate policy and urban mobility. Hosting the NDC-Partnership. Country offices in India and China with high expertise on urban mobility and electromobility.
- **ITF:** Forum of Ministries of Transport, organising the annual International Transport Forum in Leipzig. Strong modelling expertise. Implementing the decarbonising transport project with activities in India
- **The ICCT:** Think tank focusing on fuel economy policies and energy efficiency of vehicles, incl. electro mobility. Representatives based in China and India. Implementing the IKI-funded soot-free bus project.
- **Agora Verkehrswende:** German think tank organising stakeholder dialogue on transforming transport.
- **REN21:** Global network on renewable energy. Publishing the Global Status Report on Renewable Energy.
- **SLoCaT Partnership:** Partnership of more than 100 transport organisation. Transport focal point of the Marrakech Partnership for Global Climate Action, organising the Transport Day at COPs.

Futuristic themes: Nexus between power supply and e-mobility

- Power Distribution networks must change grid planning and operation: ICT, automation, smart grid, vRE integration
- Load management, DSM, DR
- Using e-vehicle fleet as virtual power plant integrated with vRE, V2G
- Participation in ancillary services for power sector
- …..

Thank you very much for your attention!

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