



#InvestEUresearch

# Horizon 2020 Work Programme for Research & Innovation 2018-2020

## FABRIC final Event

## Charging electric vehicles: the research and deployment challenge of the future

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DG Research & Innovation  
European Commission

Research and  
Innovation

**H2020 last  
calls**



# **Opportunities for charging infrastructure research**

**LC-GV-03-  
2019 (IA)**



## User centric charging infrastructure

### Challenge

The market share of full electric vehicles is still low in many European member states. Innovative solutions need to be evaluated and developed to allow EV drivers to have better mobility experience.

The challenge is to support the accelerated deployment of recharging infrastructure – slow charging for cities and occasional ultrafast charging for long range travel.

# User centric charging infrastructures

Scope – Proposals should address all the following activities:

Address all technical areas including demonstration of the final solutions and their interoperability in multiple cities and TEN-T:

- 1) Analysis of subjective perception of charging options and identification of decision influences and concerns of users;
- 2) Attractive and convenient charging infrastructure access with connected vehicle systems avoiding waiting times;
- 3) Transparent, flexible and interconnected payment systems;
- 4) User survey about parking habits,
- 5) Improvement of the currently deployed or planned superfast charging systems
- 6) Scalable charging infrastructure for ramp-up of expected needs – power levels and charging posts, managing the impact on the grid.

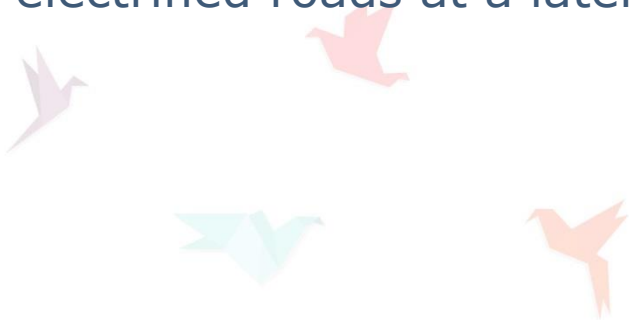
# User centric charging infrastructures

## Scope – Specific references to e-roads

Automated conductive or wireless solutions are expected with highly reliable and interoperable devices.

Test methods need to be further optimized, for instance to assess interoperability.

Optionally, further extension of the developed stationary wireless charging technology towards urban and periurban "electric road" applications, with the aim of creating an installed base of wireless-ready vehicles to provide the critical mass needed for the deployment of electrified roads at a later stage.



# User centric charging infrastructures

Scope – Proposals should address all the following activities:

Address all technical areas including demonstration of the final solutions and their interoperability in multiple cities and TEN-T:

- 7) Low power DC-charging for LEV's in combination with theft-proof parking for two-wheelers;
- 8) Analysis of market models, regulatory and harmonization recommendations;
- 9) Development of planning methods to optimize the location of charging sites, taking in consideration user needs, habits, time and costs;
- 10) Analysis and cost effective solutions for specific cases (e.g. isolated mountain or seaside locations), or special events.



# User centric charging infrastructures

## Expected Impact

- 1) Wide user acceptance beyond early adopters;
- 2) Foster investments in charging infrastructure;
- 3) Determine legal gaps and propose solutions;
- 4) Develop test methods and procedures to improve interoperability;
- 5) Facilitate grid integration of high-power chargers;
- 6) Improve and standardize charging solutions and payment systems.

Estimated EC contribution: EUR 35 Mio

**LC-GV-05-  
2019 (IA)**



## **InCo Flagship on Urban mobility and sustainable electrification in large urban areas in developing and emerging economies (1)**

### **Challenge**

Climate change, energy security and local air pollution are some of the key questions for the 21<sup>st</sup> century. Urban areas are major driving factors in growing global energy demand and GHG emissions.

Urbanisation requires integrated mobility solutions that bring together technology opportunities with local and national policy, including land use and mobility planning.

Multilateral  
International  
Cooperation  
encouraged, in  
particular

**Asia** (e.g. China, India,...), **CELAC** (e.g. Brazil) and **Africa**



# **InCo Flagship on Urban mobility and sustainable electrification in large urban areas in developing and emerging economies (2)**

Scope – Proposals should address all the following activities:

- 1) Develop tool box for advanced management strategies towards private and public electric mobility to facilitate sustainable transport and mobility solutions in cities (management of vehicles, charging infrastructure, integration of operations);
- 2) Comparative demonstration activities and pilots in the field of electro mobility in cities in Europe, Asia, Africa and CELAC (min. 4 demonstrators); road public transport for both passenger and freight;
- 3) Implementation concepts to scale up the demonstration activities (sustainable planning, financing plans, replication in other cities).

# **InCo Flagship on Urban mobility and sustainable electrification in large urban areas in developing and emerging economies (3)**

## **Expected Impact**

- 1) Quantify the potential reduction of GHG and pollutant emissions as well as traffic congestion;
- 2) UN's Sustainable Development Goals 11 and 13;
- 3) Reference models of the mobility system for short and long term benefits contributing to EU policy goals (climate, competitiveness);
- 3) A basis for strengthening the collaboration of the EU with Asia, CELAC and Africa.

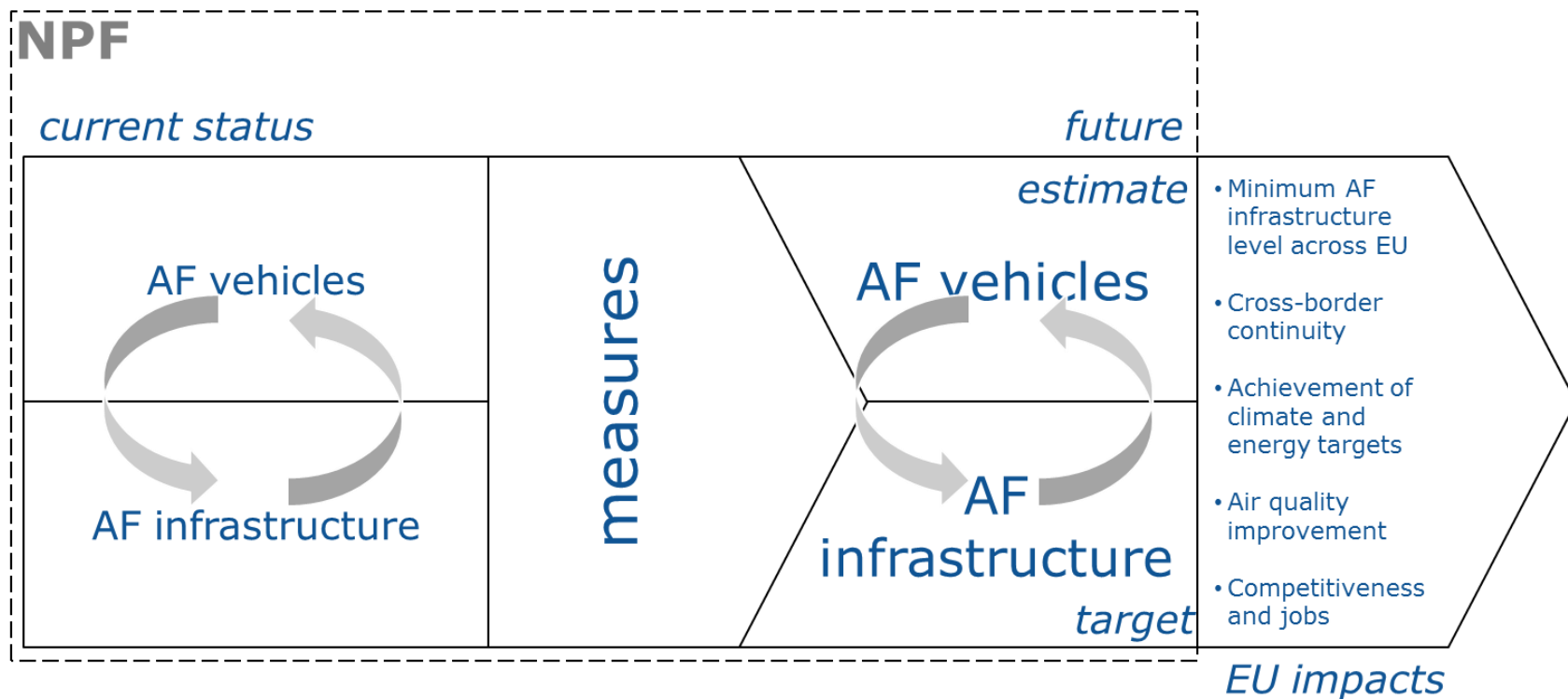
**Estimated EC contribution: EUR 18 Mio**

# Opportunities for deployment



# Alternative Fuels Infrastructure Directive: the masterplan

## Interaction of various aspects covered in the National plans and resulting impacts

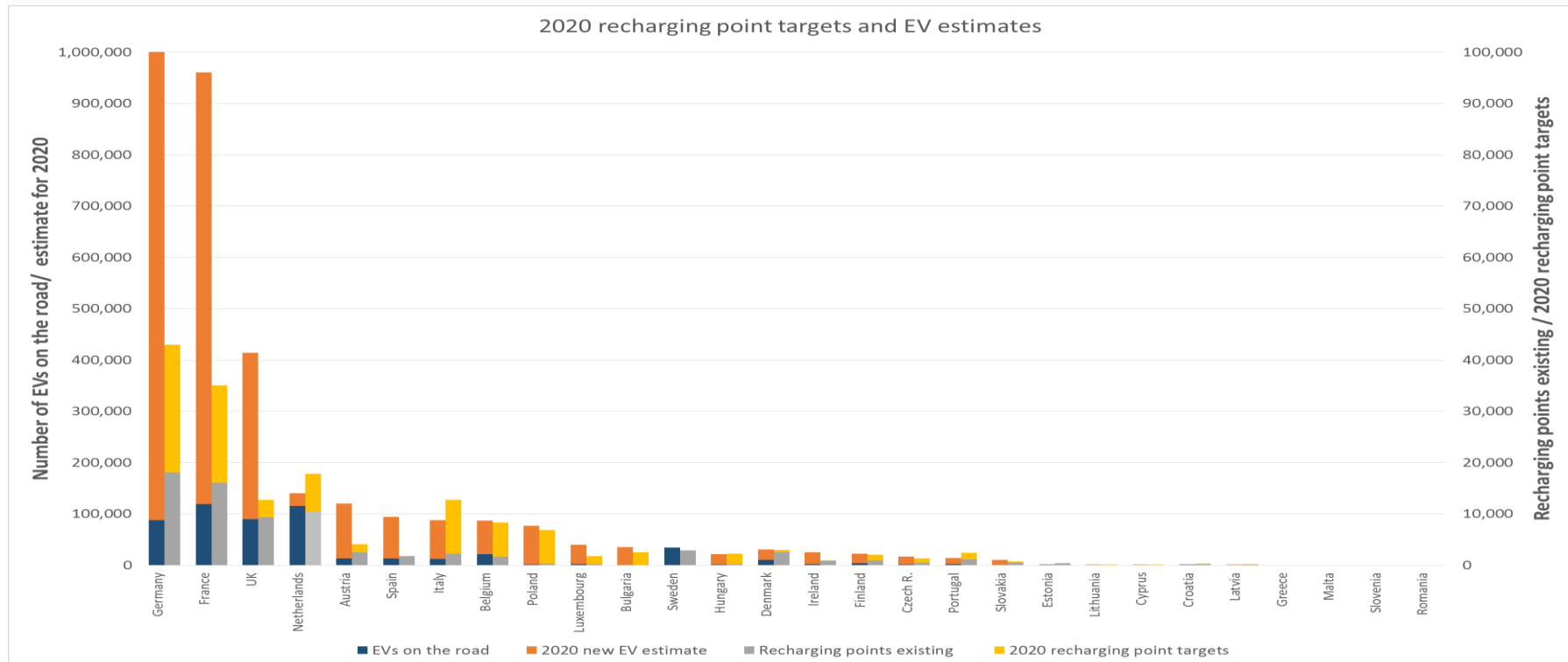


**On road charging not yet considered,  
might be in the future if sufficiently justified**

# Alternative Fuels Infrastructure Directive

## 2017 analysis of National plans - Electricity

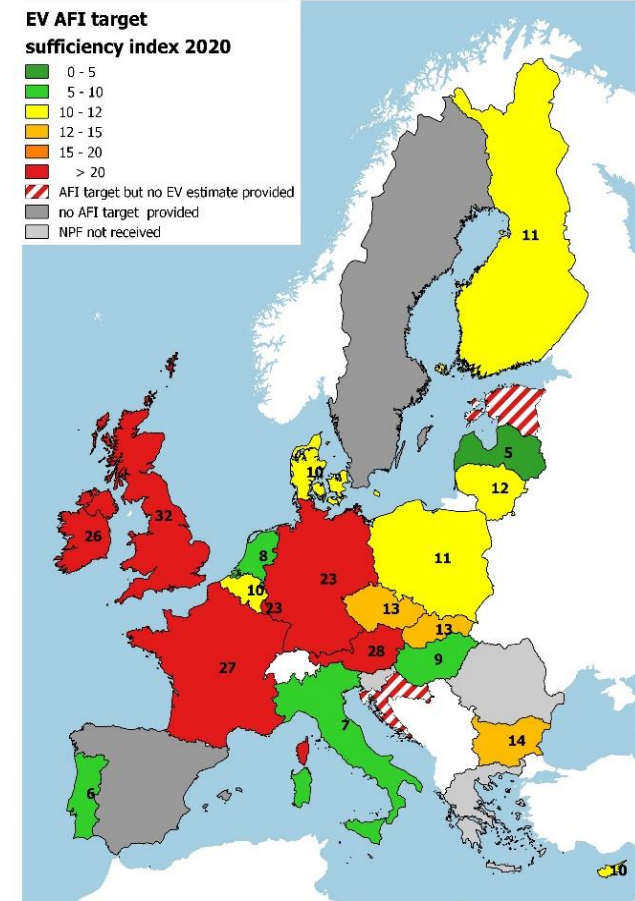
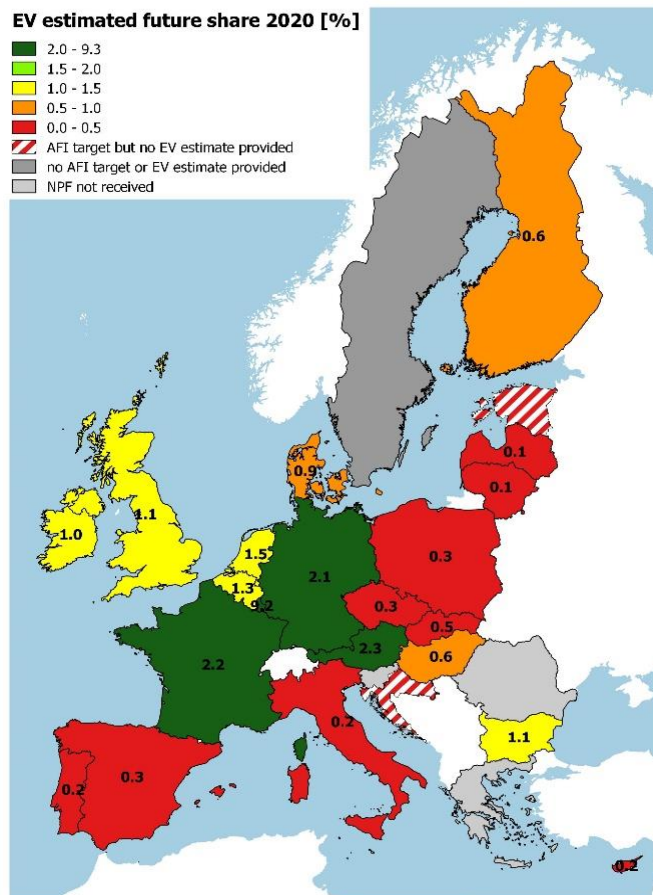
- Estimated 2020 EV shares from 0.1% to 9.2% in the different MS.
- Current attainment level (ratio of current and 2020 estimated EV stock) 0.2-83%.
- Only seven NPFs define a target that would ensure at least one publicly accessible recharging point per 10 EVs for 2020 (from 5 in Latvia to 32 EVs per publicly accessible recharging point)



# Alternative Fuels Infrastructure Directive

## Analysis of NPFs - Electricity

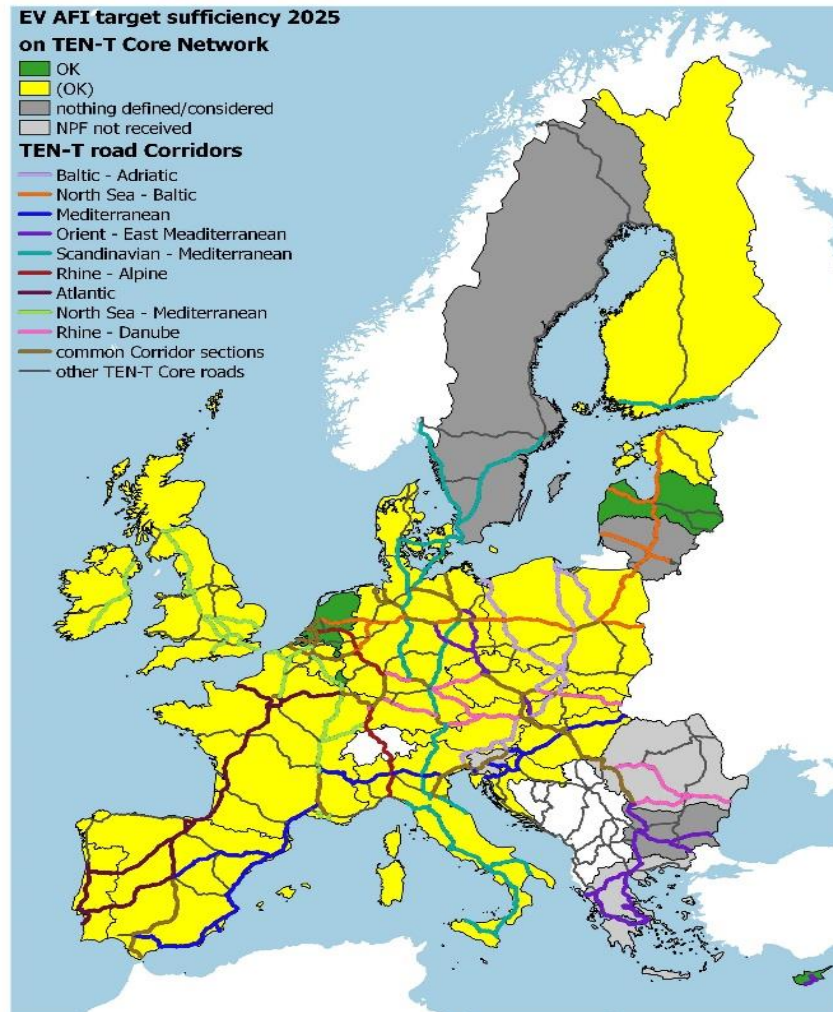
- *The current attainment level for the 2020 targets of publicly accessible recharging points ranges from 1% to 100%.*



# Alternative Fuels Infrastructure Directive

## Analysis of NPFs - Electricity

- *Much better results for the TEN-T core network*





# Connecting Europe Facility Support: some examples

## This EU funding mechanism is supporting many Fast Charging networks

➤ *In Austria and Italy*

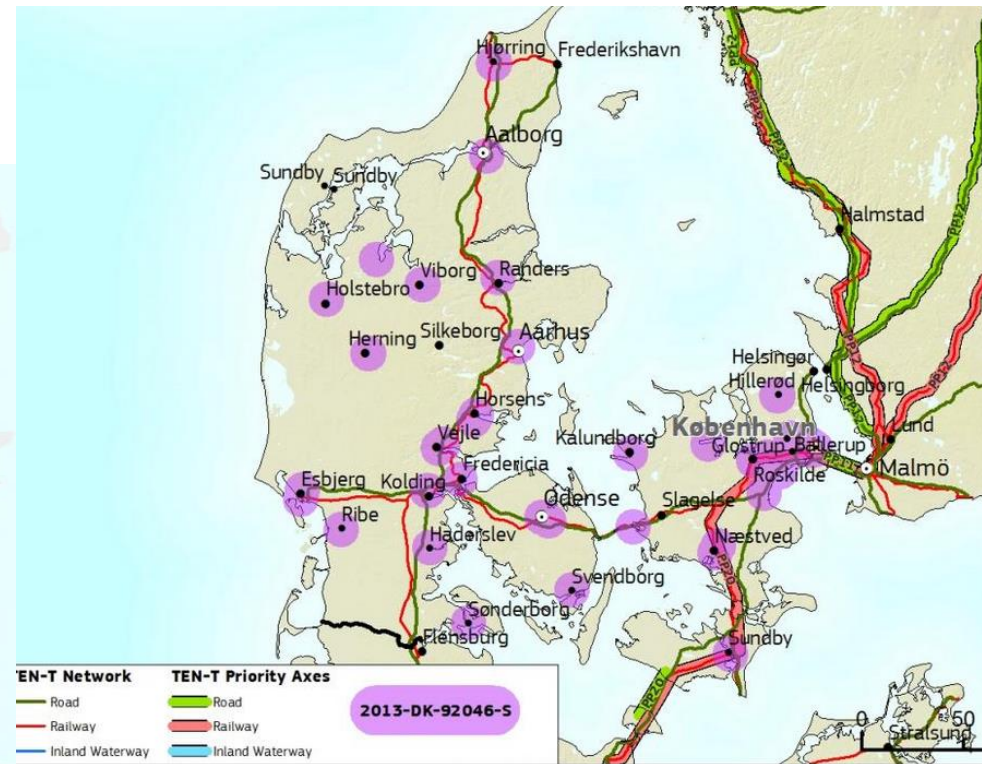




# Support from Connecting Europe Facility

**This EU funding mechanism is supporting many Fast Charging networks**

➤ *In Scandinavian countries*



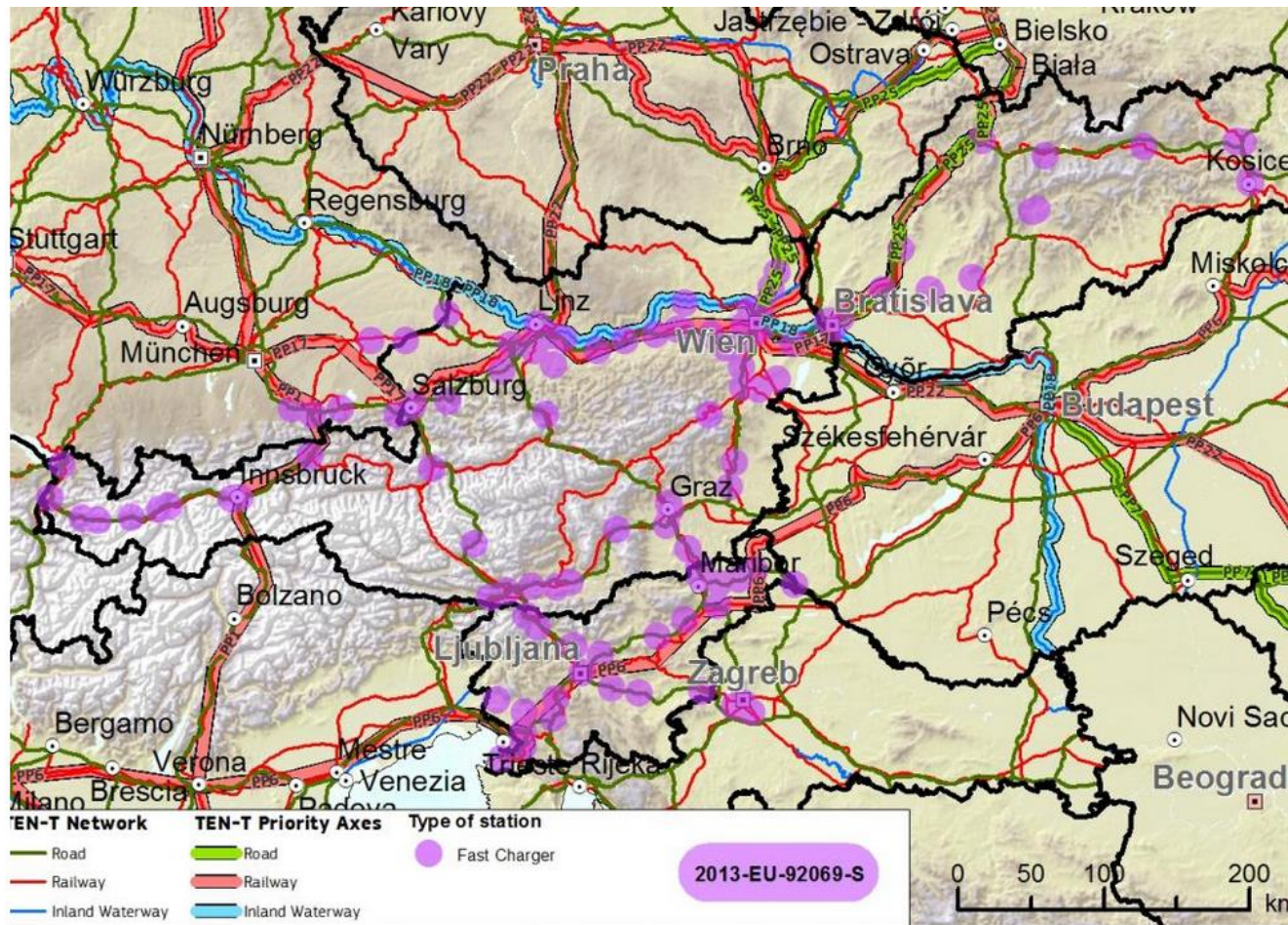
source: INEA

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# Support from Connecting Europe Facility

## This EU funding mechanism is supporting many Fast Charging networks

➤ *In Austria, Germany, Slovenia, Slovakia and Croatia*



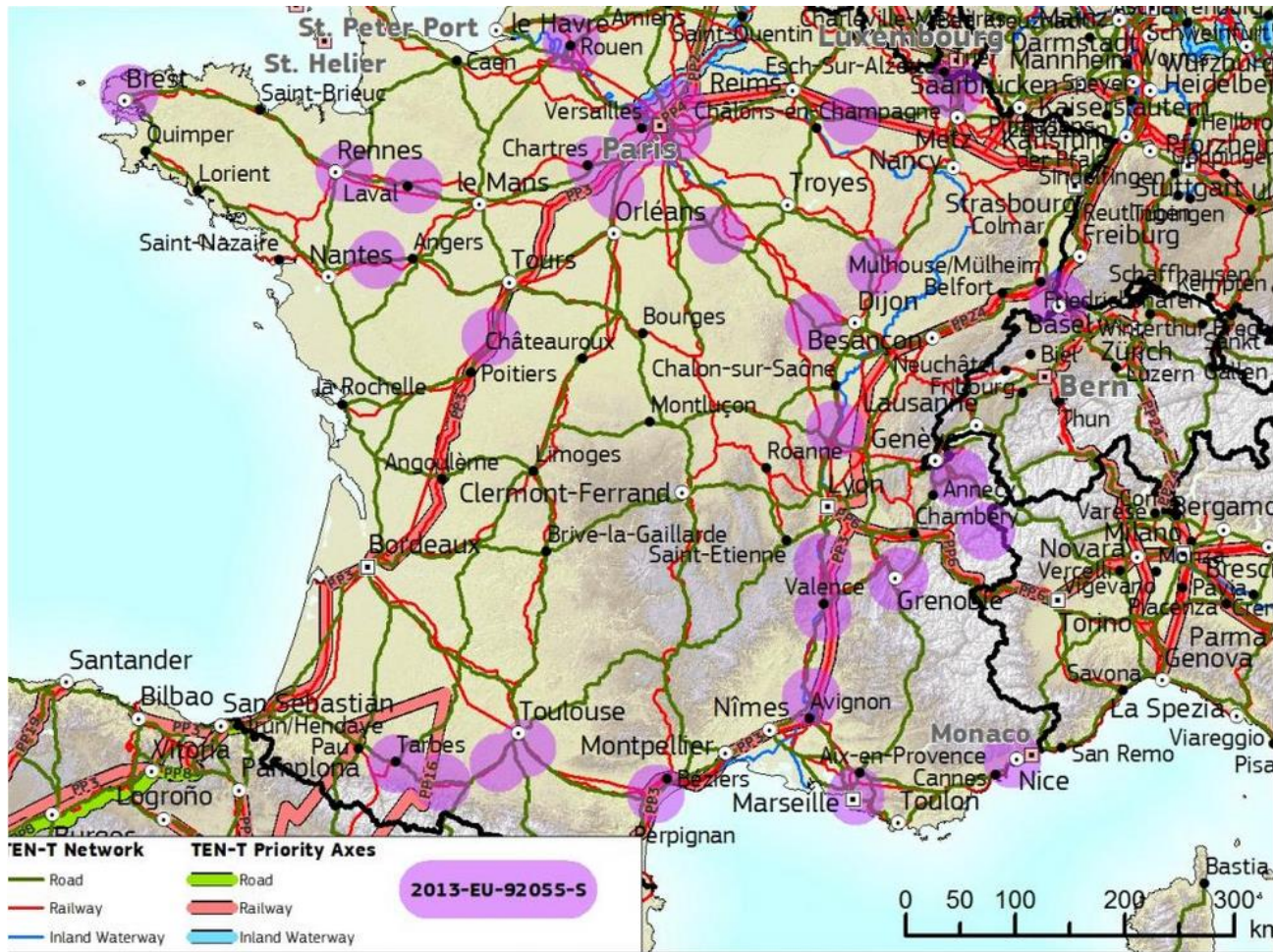
Source: INEA



# Support from Connecting Europe Facility

**This EU funding mechanism is supporting many Fast Charging networks**

➤ *France*

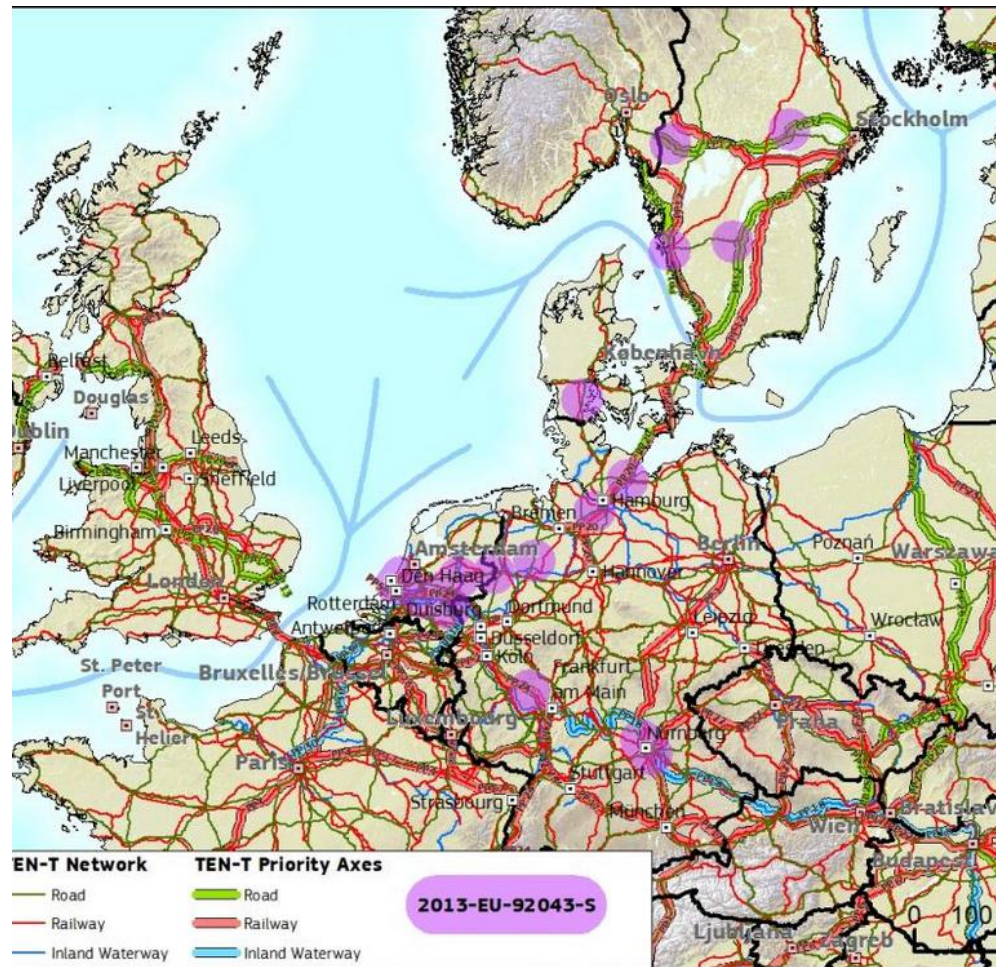


Source: INEA

# Support from Connecting Europe Facility

**This EU funding mechanism is supporting many Fast Charging networks**

➤ *Germany and Nordics*



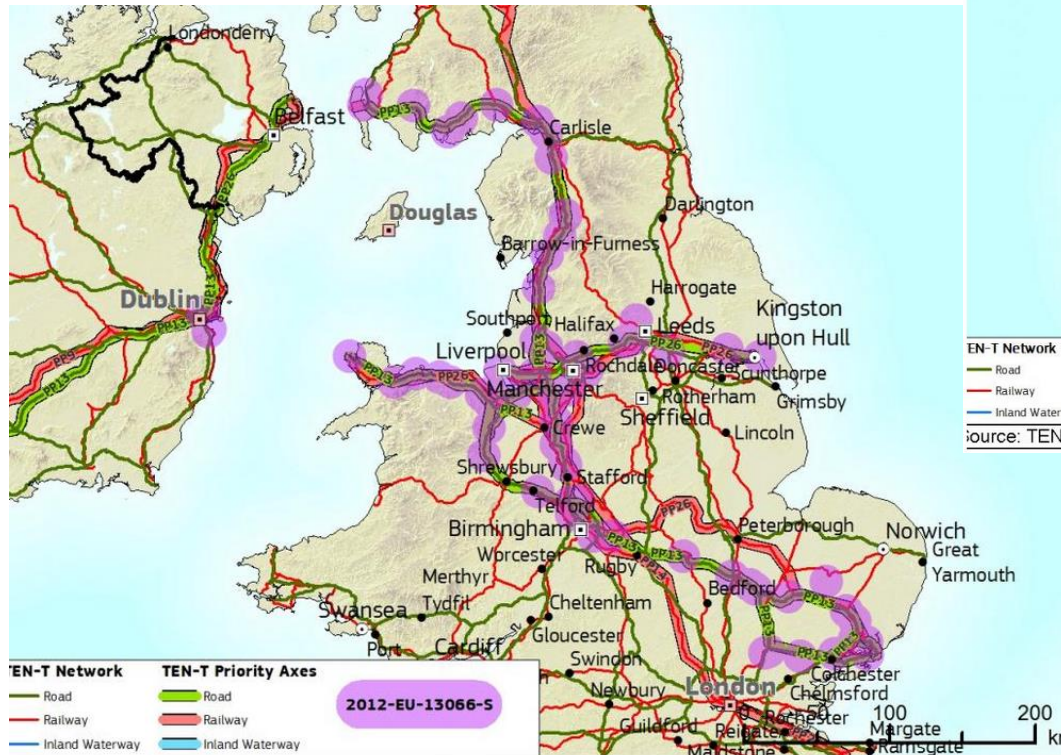
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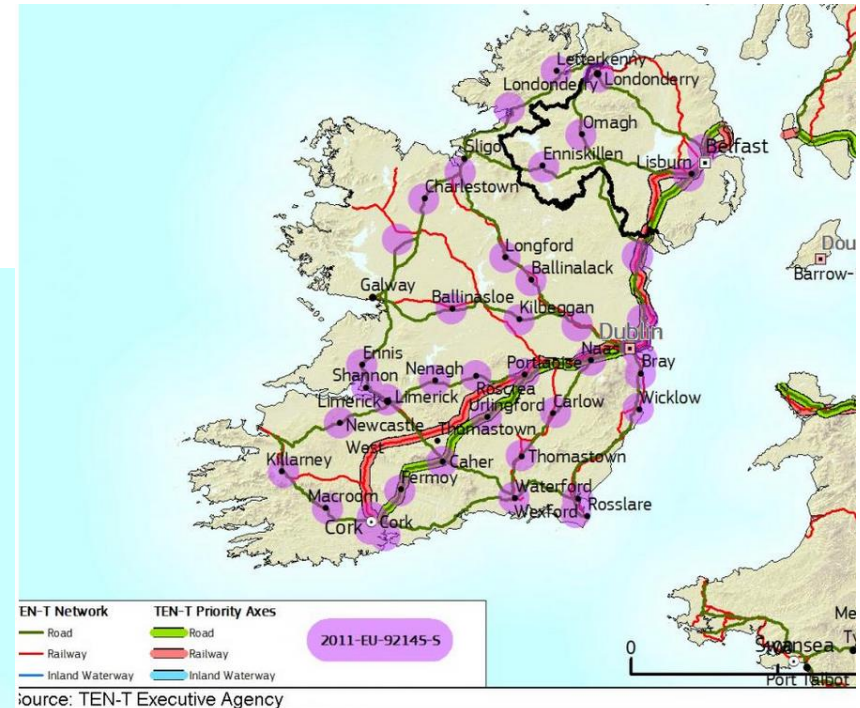
# Support from Connecting Europe Facility

**This EU funding mechanism is supporting many Fast Charging networks**

## ➤ *The British Islands*



source: TEN-T Executive Agency



source: TEN-T Executive Agency

# On road charging in CEF? Support and update of the Alternative Fuels Infrastructure Directive?

## Conclusions

- *CEF a possible funding mechanism for initial field testing, possibly for closed business cases (A to B lines with captive fleet)*
- *Needed to justify given maturity and current low EV penetration in most countries (EV leaders go ahead?), and huge chicken-egg problem, particularly for HD vehicles*
- *Even for Evs, many NPFs show low ambition, very few define sufficient corresponding targets for alternative fuels infrastructure*
- *The adoption status and likely impact of support measures seems too low as to ensure that the national targets and objectives contained in the NPFs are reached.*
- *All this can lead to an market fragmentation at EU level and even within certain MS.*
- *This risk is even higher for on road charging, as competing technologies emerge, interoperability is key*
- *A basic choice between conductive and inductive, and top and bottom access needed early on*

# Thank you!

Participant Portal  
Transport Challenge and the WP  
Questions? Contact Research Enquiry Service

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