

ICT FOR BETTER ROAD TRANSPORT IN EUROPE: DG RTD PERSPECTIVE

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ICT FOR CONNECTIVITY AND AUTOMATION: THE NEXT REVOLUTION

- ❑ Major trends that are expected to shape the future of road transport and mobility, with huge market impact
- ❑ Rapid development of automated driving technologies
- ❑ Will address major transport policy objectives, such as: safety, intermodality, energy efficiency, air quality, traffic congestion, etc.
- ❑ Automated vehicles can fundamentally change automotive industry (enable new "mobility-on-demand" services and innovative digital services)
- ❑ Bring (back) into the market categories that cannot or do not want to drive
- ❑ Perfect match with electrification, particularly in urban environments
- ❑ Cyber security is fundamental to ensure safety and acceptance
- ❑ **A total of 300M€ EU funding in the 2014-2020 period for technology and demos**



ICT FOR ENGINE AND AFTERTREATMENT: KEEPING EMISSIONS UNDER CONTROL

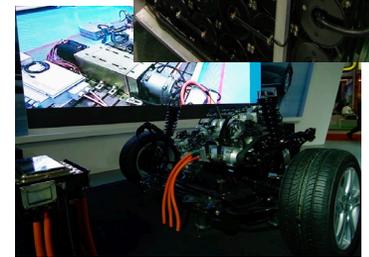
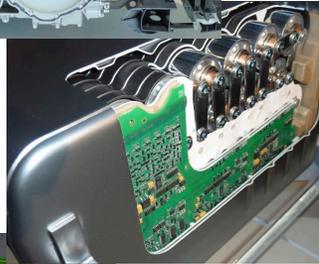


- ❑ Engine control systems at the core of emissions and other issues
 - ❑ Cycle recognition
 - ❑ Bench recognition,
 - ❑ Undeclared Alternative Emissions Strategies
 - ❑ Ineffective OBD
 - ❑ Ineffective TPMS
- ❑ Another series of scandals is emerging: this time it's customers and workshops that voluntarily reduce the effectiveness of control and aftertreatment devices, again effectively killing people
 - ❑ Blocking EGR ducts mechanically or disabling by software (if not already done by OEMs)
 - ❑ Modifying injection parameters
 - ❑ Disabling the lambda sensor in TWCs
 - ❑ Piercing or eliminating the DPF
 - ❑ Disabling the injection of AdBlue
 - ❑ Replacing the ECU or installing an additional "dongle" to increase performance and save on taxes
- ❑ Tampering is a growing concern for national and local authorities, but there are reasons, some are not the customer's fault:
 - ❑ Pollution control devices can cause loss of performance, fuel or AdBlue consumption and therefore higher operating costs, maintenance problems (clogged/broken EGRs and DPFs, MOT failures)
 - ❑ At the end of component life, replacement parts are too costly (1000-2000€ for a 100-200€ DPF)
- ❑ **Cyber security, or lack of it, is the crux of these new threats to air quality, ICT can solve it: full HW and SW protection to block tampering, while leaving full access by authorities: a specific topic is included in the 2018 call (but a lot more topics on issues related to CAD, many synergies possible)**



ICT FOR ELECTRIFICATION: ON BOARD

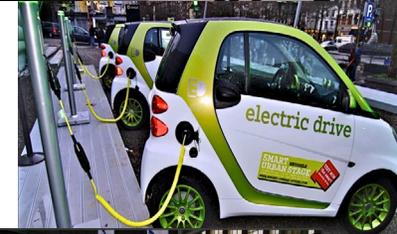
- ❑ Components need specific chips for functioning (E-motors, power electronics, battery)
- ❑ SW essential to optimise electrified vehicles and make them a success with end users
 - ❑ Powertrain control (including of course also brake blending and recuperation, normally not considered in powertrain)
 - ❑ Vehicle control (climate, active suspensions)
 - ❑ Battery Management Systems
 - ❑ Sensors
- ❑ Mobility as a Service needs advanced ICT solution, in combination to those from CAD, to make it the mobility means of choice in conjunction to other ICT tools to realise real multimodality
- ❑ Smart navigation, combining all energy consumption related parameters (in particular altitude information), to maximise range and reduce travel time considering recharging stops
- ❑ Charging control, guaranteeing sufficient range for the next day while allowing flexibility for grid management
- ❑ **ICT support of all these aspects widely funded in EU research projects**



ICT FOR ELECTRIFICATION: INFRASTRUCTURE



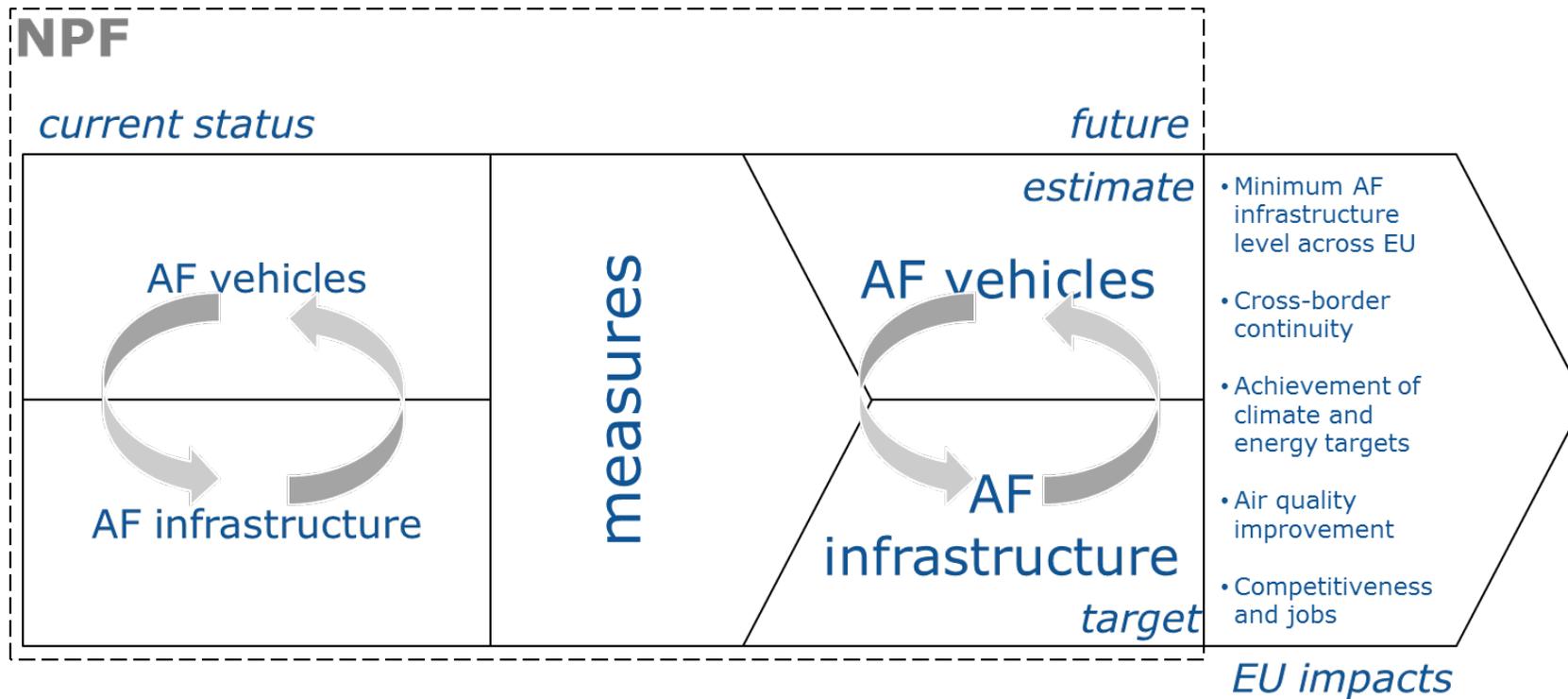
- ❑ Electrification infrastructure needs several levels of ICT support
 - ❑ Smart charging at home and in the office, to coordinate large numbers of slow charging points avoiding peaks
 - ❑ Advanced fast charging, with convenience functions like reservation and interleaving
 - ❑ Simplified payment and billing (no more multiple, incompatible cards and apps)
 - ❑ Smart navigation simplifying long trips with multiple charges
- ❑ Strong support for infrastructure research in the past (as we saw in previous presentations and sessions), continuing in the 2019-2020 calls
- ❑ **LC-GV-03-2019 - User centric charging infrastructure**
 - ❑ Pervasive cheap slow charging for cities and occasional ultrafast charging for long range travel
 - ❑ Optionally, on road charging if sufficiently mature for application
 - ❑ Including demonstration of the final solutions and their interoperability in multiple cities and TEN-T
- ❑ **LC-GV-05-2019 InCo Flagship on Urban mobility and sustainable electrification in large urban areas in developing and emerging economies**
 - ❑ Tool box for advanced management strategies towards private and public electric mobility
 - ❑ Includes both vehicles and infrastructure
 - ❑ Comparative demonstration activities and pilots in the field of electro mobility in cities
 - ❑ Multilateral International Cooperation encouraged, in particular Asia (e.g. China, India,...), CELAC (e.g. Brazil) and Africa
 - ❑ Scale up concepts for the demos (sustainable planning, financing plans, replication in other cities).
- ❑ **ICT is the key to an attractive and streamlined EV user experience**



REASERCH IS NOT ENOUGH: EU FUNDING OPPORTUNITIES FOR DEPLOYMENT

Alternative Fuels Infrastructure Directive: the masterplan

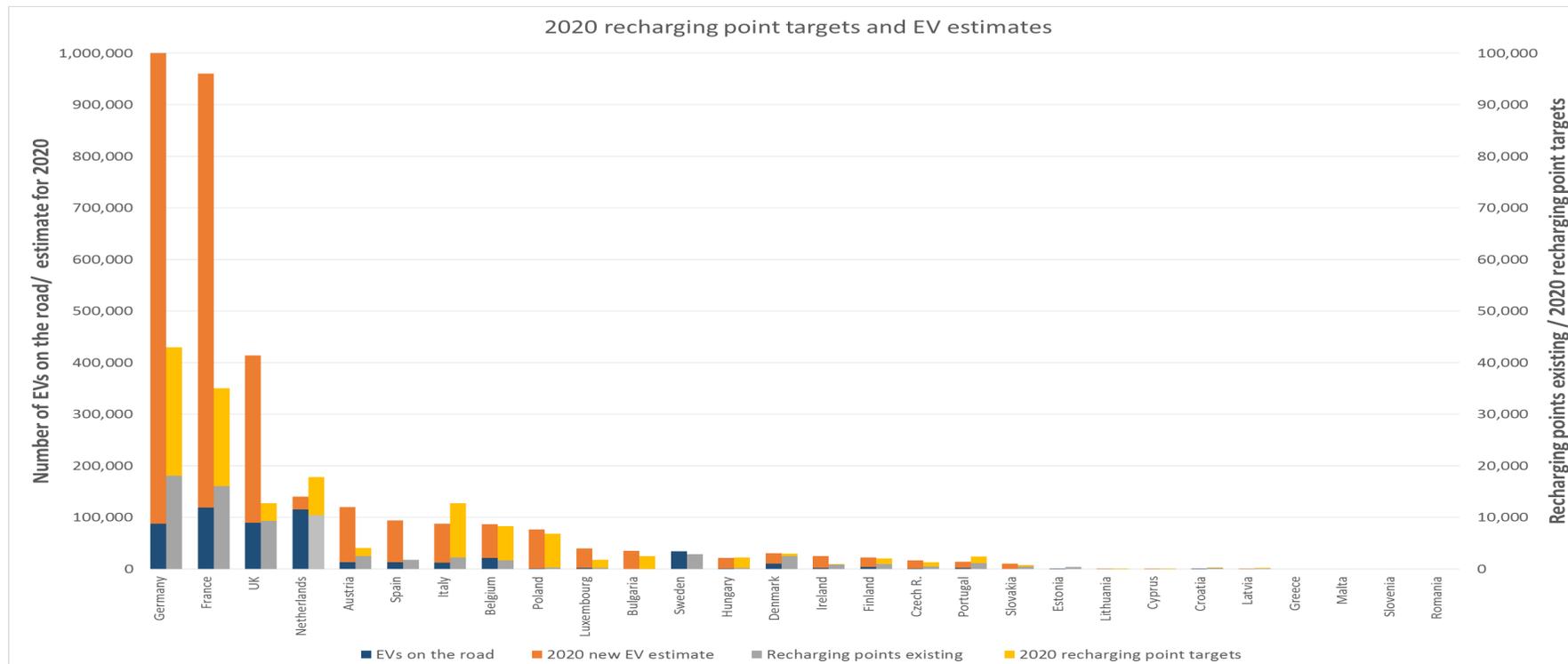
Interaction of various aspects covered in the National plans and resulting impacts



CEF financing mostly for fast charging projects between MSs, on-road charging not yet implemented, might be in the future if sufficiently justified

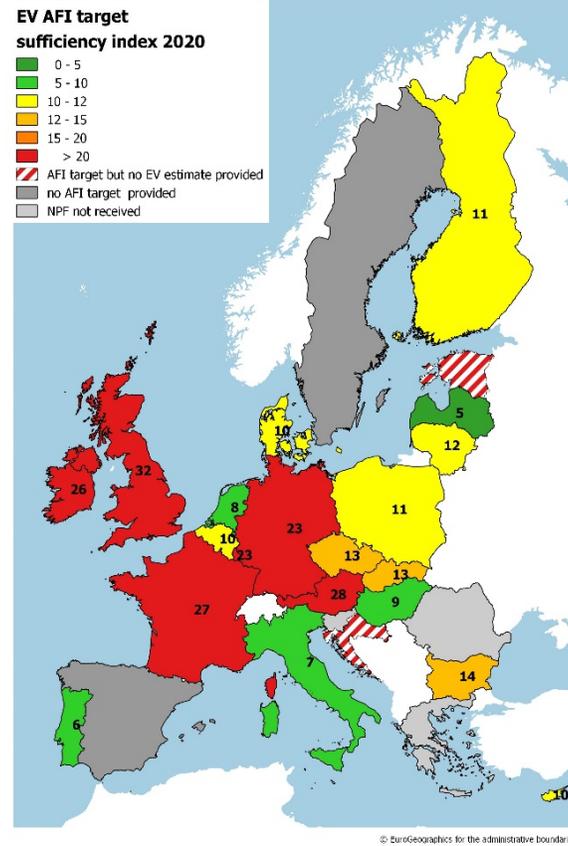
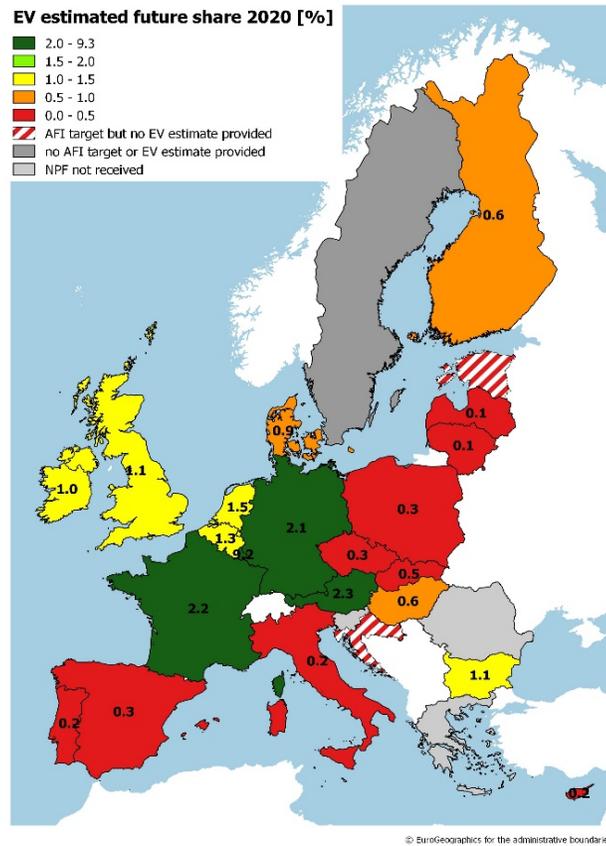
2017 analysis of National plans - Electricity

- *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*

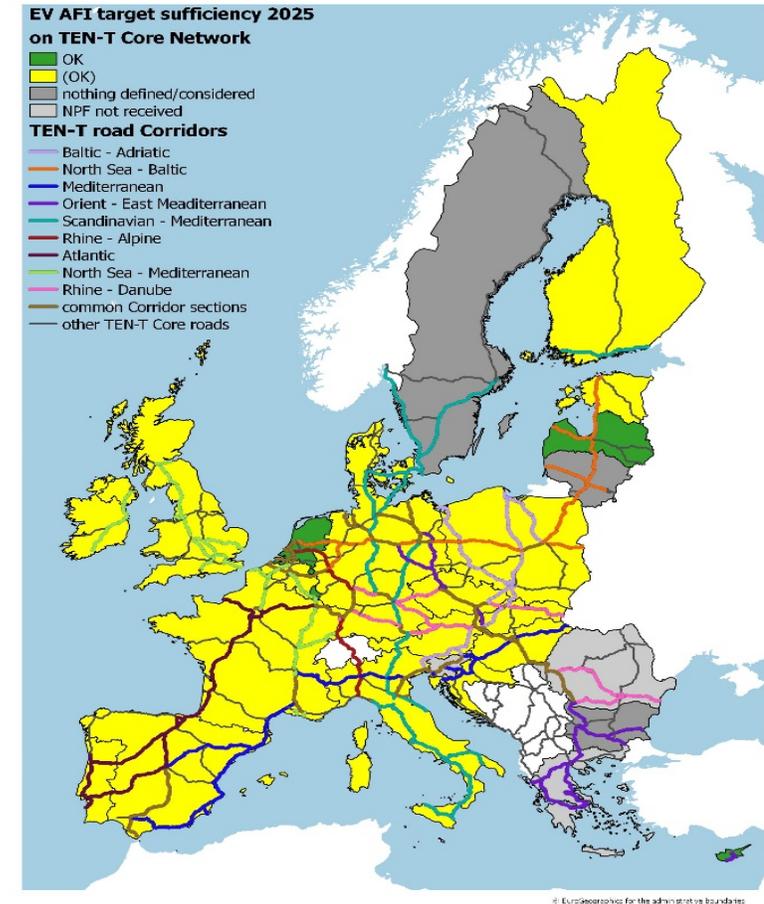


Analysis of NPFs - Electricity

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



➤ 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

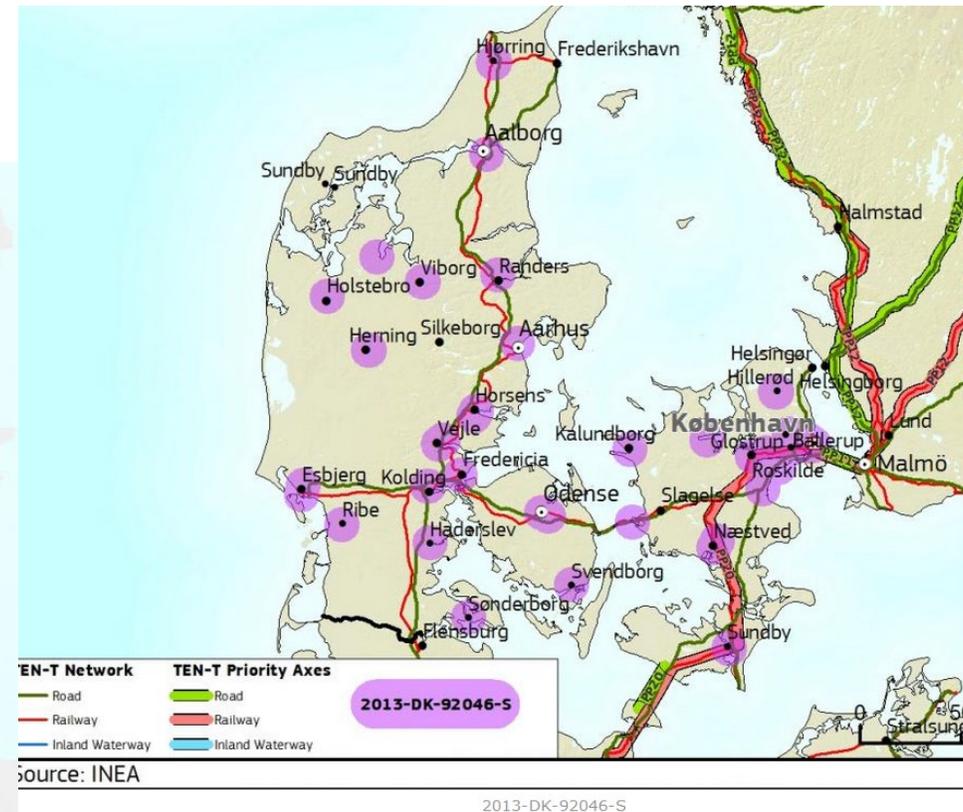
➤ *In Austria and Italy*



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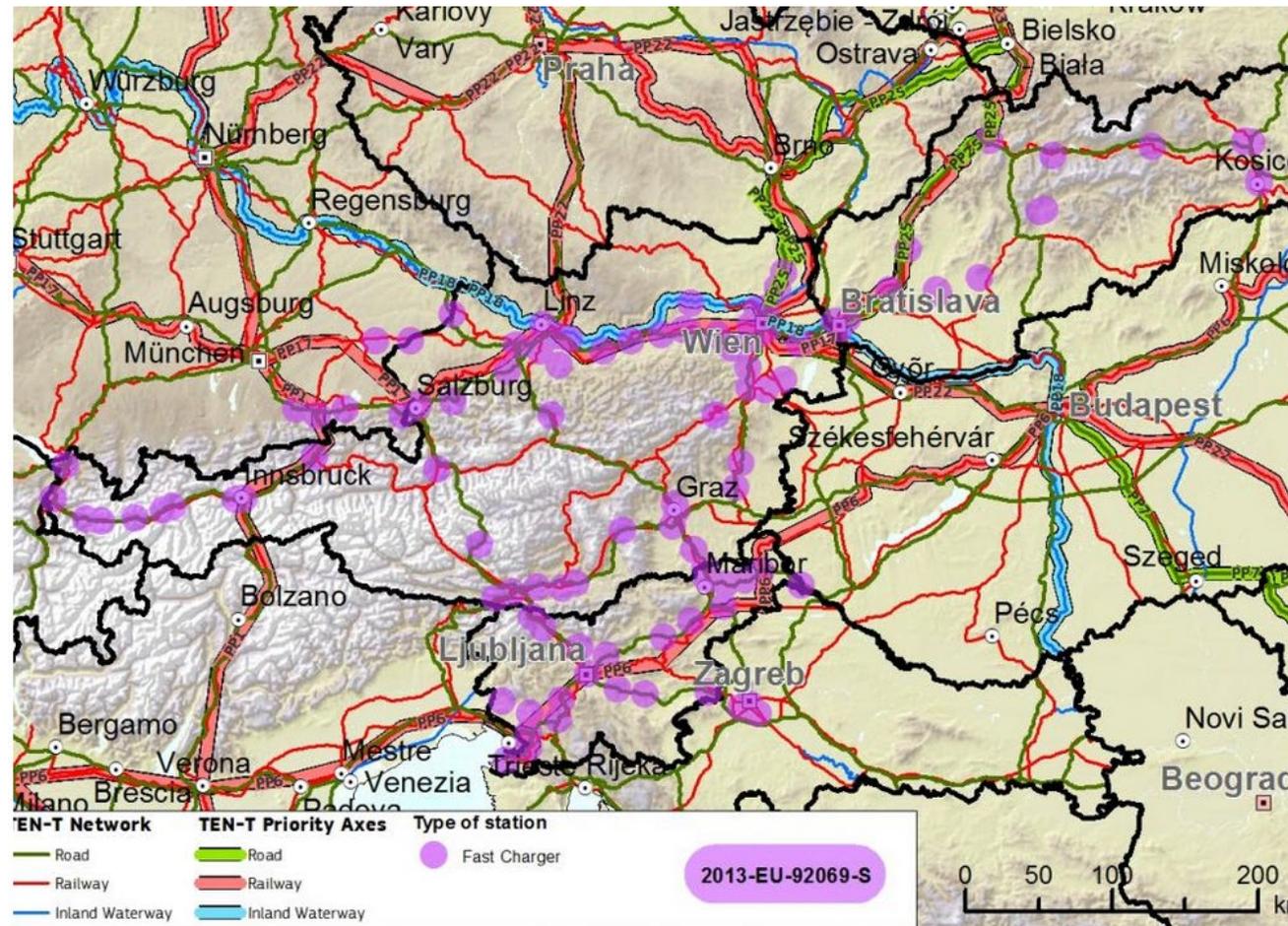
➤ *In Scandinavian countries*



Connecting Europe Facility Support: some examples

This EU funding mechanism is supporting many Fast Charging networks

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

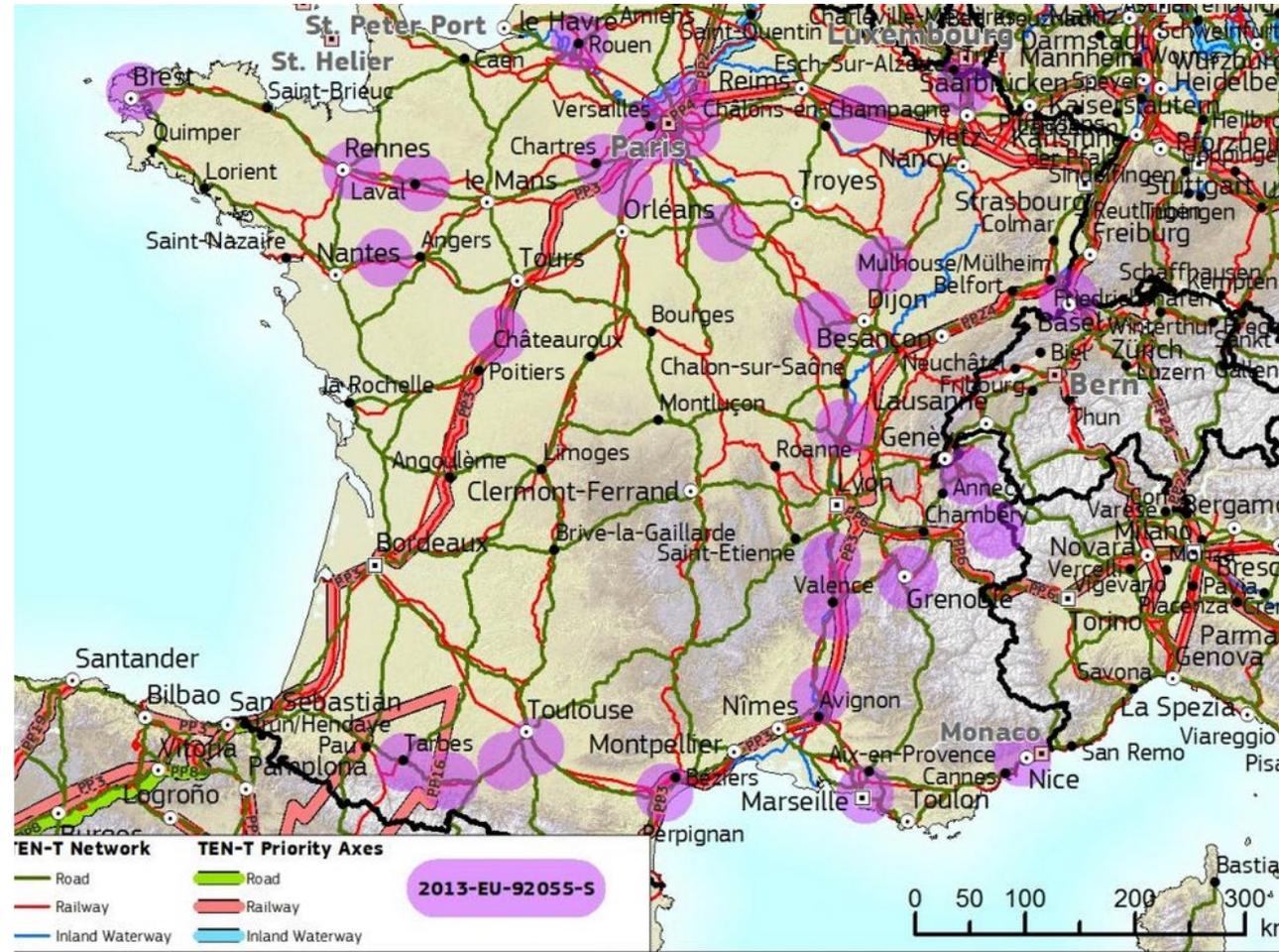


Source: INEA

Connecting Europe Facility Support: some examples

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➤ *France*

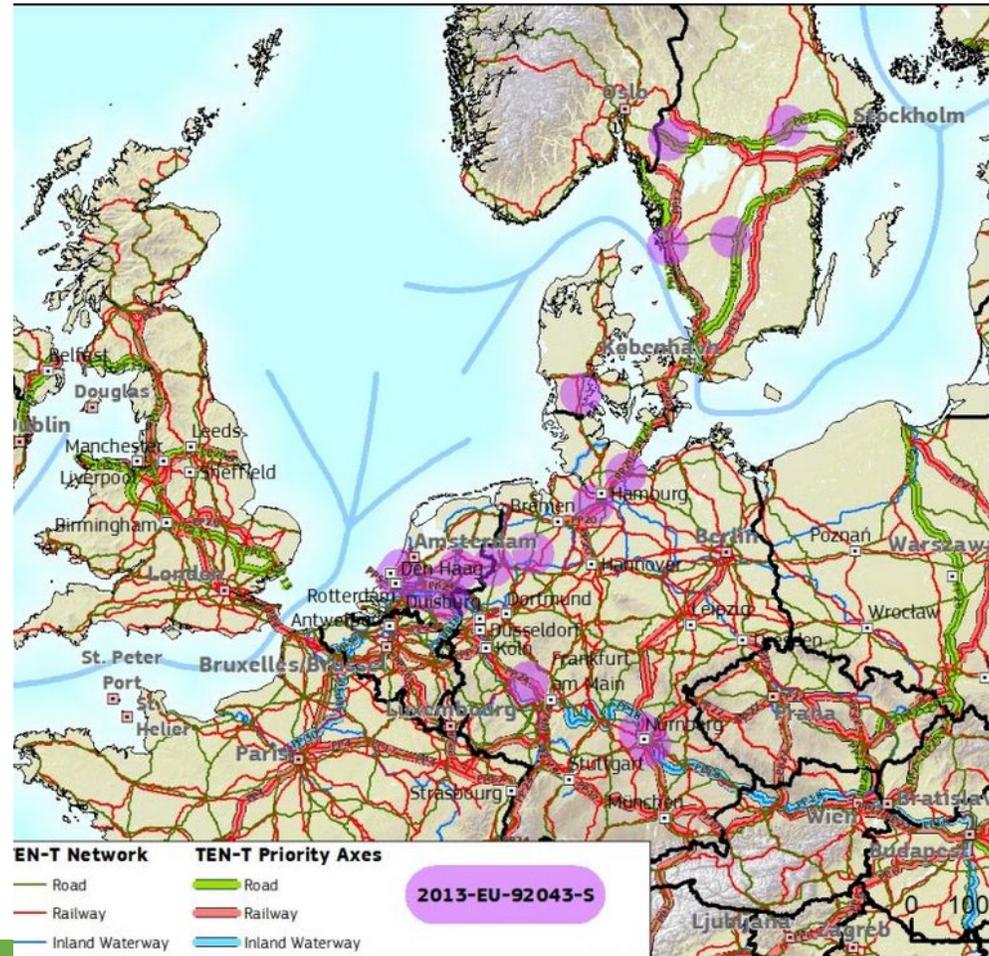


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- *Germany and Nordics*

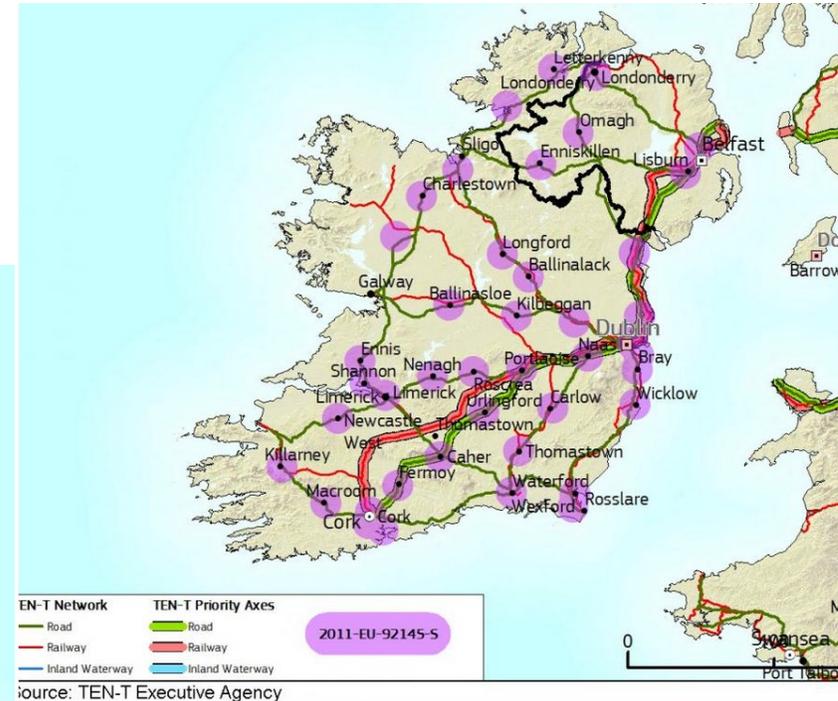
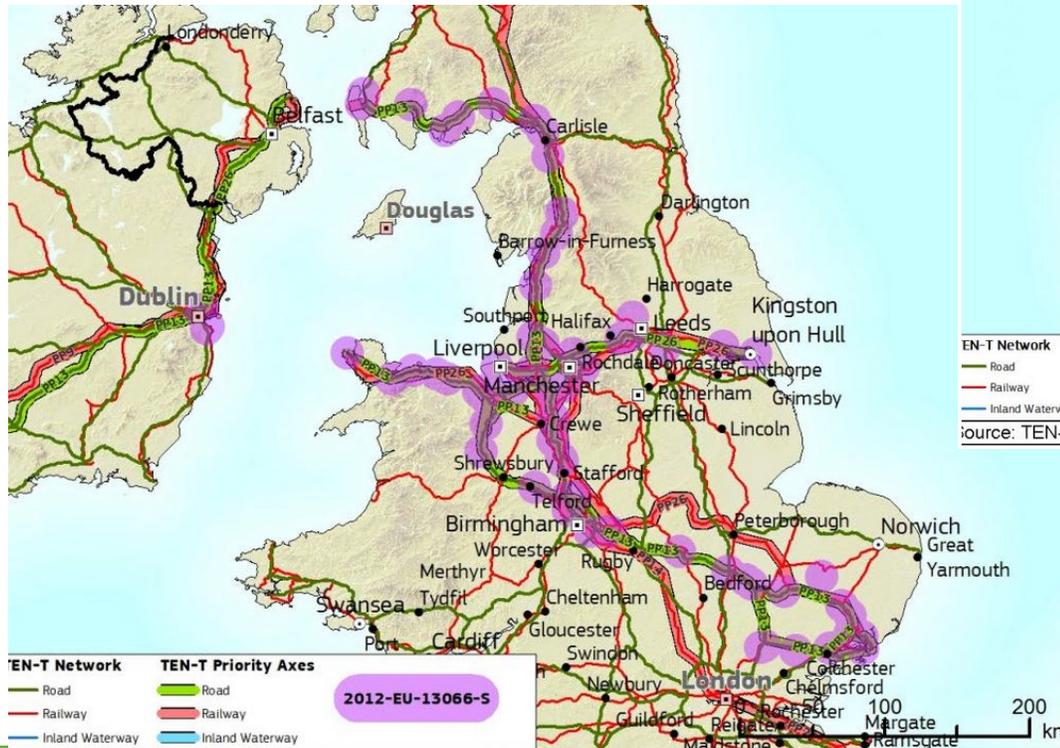


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➤ *The British Islands*



Possible updates of the AFI Directive



- *Conventional/fast charger deployment close to minimum EU coverage (thanks also to bigger batteries)*
- *ICT and political will needed to streamline payment (including cash/credit card) and to lead to a common and pleasant user experience, particularly when EV penetration will increase*
- *Even for EVs, many NPFs show low ambition, very few define sufficient corresponding AFI targets*
- *Support measures and their implementation too low to ensure that national targets and objectives contained in the NPFs are reached*
- *Interoperability of ultra-fast charging is fundamental, but 400/800 V split and no/few compatible cars*
- *Fast AC/DC split added costs and finally AC has low penetration, a real waste: a case for euthanasy?*
- *CEF a possible funding mechanism for initial field testing of on road charging , possibly for closed business cases (A to B lines with captive fleet)*
- *Good justification needed given maturity and current low EV penetration in most countries (EV leaders go ahead?), and huge chicken-egg problem, particularly for HD vehicles*
- *Outside closed business cases, ICT is key to billing*
- *Market fragmentation at EU level and even within MS is a risk for several technologies (see above)*
- *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 contact line is needed early on*



*Thank you for your attention!
And see you at the H2020 infoday
on October 23rd in Brussels*