

## Summary

In January 2013, the Commission published the Clean Power for Transport Package. T&E supports technology neutral policy, but we also recognise that emerging technologies require support to compete with the use of oil for transport. T&E welcomes the Commission's initiative, but believes that the detailed proposal has shortcomings.

## Context

The Clean Power for Transport Package consists of a Communication on a European alternative fuels strategy, a proposal for a Directive on infrastructure and standards (2013/0012 COD), and an accompanying document describing an action plan for the development of Liquefied Natural Gas (LNG) in shipping.

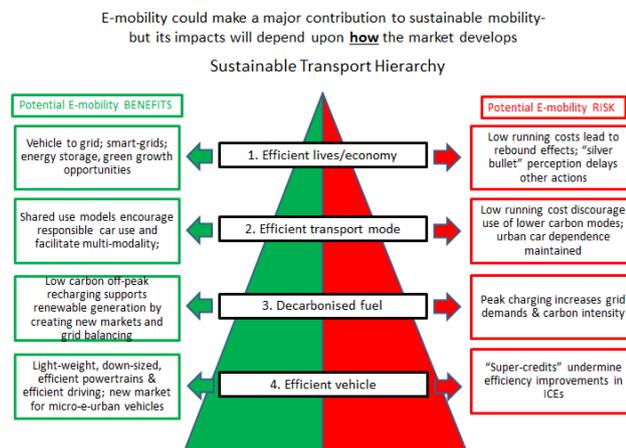
This paper addresses the key limitations of the Commission's proposal and presents solutions to facilitate a sustainable shift to e-mobility<sup>1</sup> by:

- Focusing on the quality rather than quantity of public recharging and setting minimum requirements for recharging in Member States that recognises the market will not grow homogeneously.
- Strengthening the National Action Plans (NAPs) to encourage infrastructure, sale and use of EVs.
- Removing requirements for installing fossil-gas refuelling.

## Support for a sustainable shift to e-mobility, not fossil hydrocarbons

Policies to promote a shift towards cleaner, lower carbon vehicles and fuels should, as far as practicable, be technology neutral to enable options to compete on the basis of their environmental performance. However,

the virtual monopoly use of oil for transport justifies initial policy interventions to enable environmentally superior solutions, like e-mobility, to emerge and eventually complete. If done well e-mobility is a key element of shifting to lower carbon transport and also drastically reduces both air and noise pollution. E-mobility can also enable better use of renewable electricity through off-peak charging. Vehicle batteries could potentially also be used to store energy at times of low demand and then feed this back to the grid at peak times, reducing the need for peaking plants and maximising the utility of renewable assets.<sup>2</sup> A well-managed shift to e-mobility will also have economic benefits creating jobs,<sup>3</sup> improving energy security and balance of payments and protecting drivers from volatile fuel prices.



### Opportunities and risks from e-mobility

<sup>1</sup> Electrically powered advanced plug-in hybrid, battery-electric and fuel-cell vehicles

<sup>2</sup> Mayor of London (2009) Turing London Electric - Draft

<sup>3</sup> Fuelling Europe's Future – How Auto innovation leads to EU jobs (2013)

The provision of refuelling/recharging infrastructure is an important element in enabling a transition. But where and how ultralow carbon vehicles are driven, how the “fuel” is produced or generated; and when the vehicle is charged will all profoundly affect whether e-mobility is a sustainable transport solution. E-mobility could make a sizable contribution towards more sustainable mobility – but it is not a panacea. The focus is to ensure that e-mobility grows sustainably.

There is no convincing case for public support for the roll-out of natural gas in transport. Natural gas is not a ‘bridge fuel’ towards a more sustainable transport future. It is simply a different fossil hydrocarbon-based energy burnt in internal combustion engines and has limited CO<sub>2</sub> benefits.<sup>4</sup> A similar reasoning applies to use of LNG in shipping<sup>5</sup> where the market will invest in LNG if it is convinced that the combined effects of more stringent marine fuel and engine regulations and a widening of the price gap between gas and oil makes it worthwhile. There are better uses for public money than subsidising the use of another fossil fuel.

Concerning biofuels it is important to note that not all biofuels present in the EU market today can contribute to greenhouse gas (GHG) emissions savings. It is necessary to take an approach that further differentiates amongst them and rewards only those with low carbon intensity. This can be delivered through the Fuel Quality Directive, with correct carbon accounting for all types of fuels (In direct Land Use Change (ILUC) factors in the case of biofuels) including foreseeable sustainability criteria and clear safeguards. Such an approach would unlock large part of the public subsidies absorbed by the biofuels sector (more than €6bn in 2011). These financial resources could be then allocated to the deployment of infrastructure and other types of alternative fuel that deliver genuine and long term carbon savings

### How much and what EV infrastructure does Europe need?

The size of the future market for electric vehicles (EV) is highly uncertain. The Commission’s forecast range is for a fleet of between 1.7 and 8 million<sup>6</sup> cars by 2020 and the Proposal mandates Member States to install 8 million charging points that is sufficient for recharging 4 million vehicles. The Commission’s proposal only focuses on standard electric cars, omitting any alternative two- or three-wheeled electric power vehicles, which will play a significant role in densely populated areas. Whilst an early niche market exists, and will grow, significantly better and cheaper batteries and fuel-cells will be needed for EVs to compete in the mainstream market with conventional vehicles burning oil. The timing of new batteries and fuel cells is uncertain and recharging infrastructure should grow in line with sales rather than providing infrastructure in the expectation it will drive the market. We feel that the Commission proposed mandated is on the high side and to do so risks investment being made in little-used infrastructure when support for R&D or interventions to support demand for or use of EV may be more appropriate.

Provision of infrastructure is an important market enabler but take-up of e-mobility will not evolve homogeneously across the EU. Some Member States will seek to lead (and are willing to bear the costs of early adoption) with the intention of being a major supplier of vehicles and/or components. Other Member States strongly support the early market in order to decarbonise transport or reduce oil dependence. Some Member States will be late adopters of e-mobility. We feel the primary purpose of the directive should be to ensure that e-drivers from early-adopting countries have a recharging service at their disposal when taking their vehicles abroad, not to ensure an even uptake of e-mobility across Europe, but rather

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<sup>4</sup> CE Delft (2013) Natural Gas in Transport: considers a full life-cycle is considered including methane leakage, energy use for compression or liquefaction, and lower ‘tank to wheel efficiency.’

<sup>5</sup> ICCT (2013) Assessment of the fuel cycle impact of liquefied natural gas as used in international shipping

<sup>6</sup> European Commission (2013) Commission staff working document – Impact assessment. Accompanying the document, Proposal for a Directive on the deployment of alternative fuels infrastructure (COM(2012) 18)

The Commission proposal focuses exclusively on the amount of charging points, without looking at where those points should be established, and without recognising that the costs and performance of the recharging points vary hugely, as shown in the table below. Therefore we propose to promote public recharging in both urban centres and along the TEN-T network, and to reward Member States that install more practical, faster public recharging that more readily addresses range anxiety concerns.

| Application   | Charging point features   | Power (kW) | Charge time | Production cost (EUR) | Installation cost (EUR) | Operating cost (as % of capital cost) |
|---|---|------------|-------------|-----------------------|-------------------------|---------------------------------------|
| <b>Residential</b>  | Wall box, one plug Mode 1 or 2<br>User protection during charging<br>Options for individual metering system | 3kW        | 4-8 hours   | 400                   | 1,000                   | 1%                                    |
| <b>Workplace</b>  | Ground mounted, two plugs<br>Choice of access control systems e.g. cards, keypad with code.                 | 7kW        | 4-8 hours   | 800                   | 1,000                   | 5%                                    |
| <b>Car parks, street side parking, shopping centres, etc.</b> | Ground mounted<br>High resilience 2 plugs or more<br>Different access options                               | 22kW       | 1-2 hours   | 6,000                 | 3,000                   | 5%                                    |
| <b>Stations on motorways</b>                                  | Fast charging<br>Mode 3 and 4 2 plugs or more<br>High resilience  | 43kW       | 30 mins     | 22,000                | 25,000                  | 5%                                    |

### Proposal for smart electric recharging infrastructure - less focus on quantity more focus on quality

The Commission's proposal is designed to result in the installation of 8 million<sup>7</sup> charging points, 800,000 of which should be publicly available. We propose to make the Directive better targeted and relevant at the EU-level whilst recognising subsidiarity. The Directive should stipulate a minimum level of public not\_total charging points<sup>8</sup> and differentiates between recharging needed for inter-urban trips and end of destination charging in urban areas.

The National Action Plans (NAPs) also need strengthening and should require these to aim to achieve a minimal level of sales of ultra-low carbon vehicles<sup>9</sup> in every EU Member State in order to create an EU-wide market for vehicles alongside the new recharging infrastructure. This would ensure no part of the Union is excluded from the shift to e-mobility but would not to be prescribed to a uniform speed or approach. The approach is based upon four recommendations that would lead to reduction in the required amount, and cost, of recharging. Additionally, we also propose to remove the requirement of Member States to install fossil-gas refuelling infrastructure. The recommendations are:

#### 1. To create an EU-wide network of fast charging points along the TEN-T network

Similar to the approach proposed for hydrogen (Article 5), this would ensure fast charging points (43kW) are introduced, with a maximum separation of 50km, on major motorways between large urban areas to facilitate inter-urban use of EVs and enable range-extended vehicles to operate on electric power for a larger proportion of journeys. By 2020, the TEN-T network will consist of 95,000km<sup>10</sup> of road. The required fast charging would therefore amount to 3.840 locations.<sup>11</sup> The cost of this requirement, approximately €100 million<sup>12</sup> should be met by requiring operators of large existing petrol-stations to provide integrated refuelling / recharging infrastructure in order to provide consumer choice and achieve a level playing field between energy options.

#### 2. EU-wide adoption of EVs

The NAP (Article 3) should include sufficient policies and measures to enable a minimal take-up of ultra-low carbon vehicle in all Member States such that EV sales in every

<sup>7</sup> European Commission (2013) *ibid*

<sup>8</sup> Whilst off-peak home charging is the lowest carbon and most practical recharging for most users of electric cars how private recharging infrastructure develops is a matter for personal choices and Member State subsidiarity and should be beyond the scope of this Directive.

<sup>9</sup> Less than 50g (CO<sub>2</sub>) /km.

<sup>10</sup> European Commission, Eurostat, Trans-European networks in transport (TEN-T)

<sup>11</sup> One recharging station is required every 50km on each carriageway.

<sup>12</sup> 3.840 locations costing €25,000 each

Member State grow to represent at least 3% total new car sales by 2020. This will create a fleet of at least 2.3 million<sup>13</sup> EVs on the EU's roads by 2020 to utilise the proposed recharging infrastructure. This is intended to ensure all parts of the Union contribute to the shift to e-mobility and that there are no gaps in the Union where use of EV's is impracticable. Electric vehicles only have great potential to decarbonise transport, when the source of energy is renewable and low carbon and national grids vary in their carbon intensity. The uptake of EVs should be encouraged in parallel with decarbonisation of the grid and NAPs should include proposals from Member States to show how they will increase the amount of renewable energy to match the additional to energy consumed by EVs.

### 3. **An appropriate level of high quality public recharging in all major urban centres**

As an element of the NAP Member States shall ensure there is sufficient public-recharging infrastructure to allow easy recharging of EVs in urban centres throughout the EU. The NAPs (Article 3) will aim to ensure EU-wide a fleet of at least 2.3 million vehicles<sup>14</sup> - four -, three -, and two-wheeled. On this basis there should be, at a minimum one publicly available recharging point for every five vehicles (as the Commission proposed) the amount of required recharging is 456,000 points. To encourage supply of faster recharging points in urban areas:

- Recharging points with a power  $\leq 7\text{kW}$  should count as 1 recharging point
- Recharging points with a power  $\geq 7\text{kW}$  but  $\leq 22\text{kW}$  count as 1.5 recharging points
- Recharging points with a power  $\geq 22\text{kW}$  but  $\leq 43\text{kW}$  count as 2 recharging points
- Recharging points with a power that is  $\geq 43\text{kW}$  count as 5 recharging points.
- Recharging points dedicated to car sharing schemes count as 2 recharging points.

This recharging infrastructure would be in addition to the 3,840 fast charging stations needed to facilitate inter-urban journeys and would replace the Commission approach proposed in Article 4. The distribution of recharging points between Member States would be based upon the Commission's formula. The minimum level of public recharging in each Member State is shown in Annex below. Many Member States with greater ambition to support electrification can clearly install many more charging points.

### 4. **A future comprehensive strategy to support the transition to sustainable e-mobility:**

A Review Clause for 2015 should require the Commission to come forward with a comprehensive e-mobility strategy that should:

- Aim to maximise the shift towards sustainable e-mobility, rather than sales of electric and ultra-low carbon cars;
- Railway infrastructure and public transport managers and owners should be consulted by the national governments to ensure that national deployment plans for recharging points deliver the highest level of multimodal transport;
- Aim at maximising environmental and cost effectiveness of the transition i.e. by including mobility with smaller and lighter electric vehicles such as e-bikes, e-mobility through collectively used vehicles in fleets and sharing schemes;
- As a sub-target, aim to accelerate the market introduction of ULCVs such that by 2030 these vehicles should reflect at least half of all new car sales.
- Integrate plans for the rapid increase in ULCVs with supply of renewable energy (including hydrogen) to power these vehicles and ensure vehicles are truly 'zero emissions'.<sup>15</sup>
- Ensure that the additional electricity demand resulting from the uptake in electric vehicles is met by additional renewable electricity, and combined with smart grids that favour renewable energy.<sup>16</sup>
- Enable the EU automotive and other industries to lead in the supply of technologies for a global shift to e-mobility.

<sup>13</sup> 2.3 million Vehicles should be on the road by 2020 if the market share of EV's grows to 3% of new car sales by 2020 EU-wide. 3% is considered a modest target.

<sup>14</sup> CE Defit (2010), Green power for electric cars – Harvesting the climate potential of electric vehicles

<sup>15</sup> CE Defit (2010), Green power for electric cars – Harvesting the climate potential of electric vehicles

<sup>16</sup> CE Defit (2010), *ibid*

## Annex

| Member States   | Step 1                           |  |   |                                      | Step 2                                   |  | Step 3  |  |                     |
|-----------------|----------------------------------|--|---|--------------------------------------|--|--|---|--|---------------------|
|                 | Existing stock of passenger cars | Existing car stock in each MS compared to EU total | Distribution of Evs based on existing stock | Share of urban population in each MS | Share of urban population compared to EU | Distribution of Evs based on share of urban population | Scaling with the estimated number of vehicles | Number of publicly accessible charging points needed | Commission proposal |
| BE              | 5,270                            | 2.19%  | 50  | 91%                                  | 1.20%                                    | 60   | 59  | 12   | 21                  |
| BG              | 2,602                            | 1.08%  | 25  | 62%                                  | 0.82%                                    | 20   | 20  | 4  | 7                   |
| CZ              | 4,490                            | 1.87%  | 43  | 67%                                  | 0.88%                                    | 38   | 37  | 7  | 13                  |
| DK              | 2,164                            | 0.90%  | 21  | 58%                                  | 0.76%                                    | 16   | 15  | 3  | 5                   |
| DE              | 42,302                           | 17.61%   | 401   | 83%                                  | 1.09%                                    | 438  | 429   | 86   | 151                 |
| EE              | 553                              | 0.23%  | 5   | 52%                                  | 0.68%                                    | 4  | 4   | 1  | 1                   |
| IE              | 1,899                            | 0.79%  | 18  | 27%                                  | 0.36%                                    | 6  | 6   | 1  | 2                   |
| EL              | 5,217                            | 2.17%  | 50  | 57%                                  | 0.75%                                    | 37   | 36  | 7  | 13                  |
| ES              | 22,147                           | 9.22%  | 210   | 87%                                  | 1.14%                                    | 241  | 235   | 47   | 83                  |
| FR              | 31,709                           | 13.20%   | 301   | 71%                                  | 0.93%                                    | 281  | 275   | 55   | 97                  |
| IT              | 36,751                           | 15.30%   | 349   | 80%                                  | 1.05%                                    | 367  | 359   | 72   | 126                 |
| HR              | 1,515                            | 0.63%  | 14  | 58%                                  | 0.76%                                    | 11   | 11  | 2  | 4                   |
| CY              | 463                              | 0.19%  | 4   | 100%                                 | 1.32%                                    | 6  | 6   | 1  | 2                   |
| LV              | 637                              | 0.27%  | 6   | 62%                                  | 0.82%                                    | 5  | 5   | 1  | 2                   |
| LT              | 1,692                            | 0.70%  | 16  | 57%                                  | 0.75%                                    | 12   | 12  | 2  | 4                   |
| LU              | 337                              | 0.14%  | 3   | 100%                                 | 1.32%                                    | 4  | 4   | 1  | 1                   |
| HU              | 2,984                            | 1.24%  | 28  | 53%                                  | 0.70%                                    | 20   | 19  | 4  | 7                   |
| MT              | 239                              | 0.10%  | 2   | 100%                                 | 1.32%                                    | 3  | 3   | 1  | 1                   |
| NL              | 7,536                            | 3.14%  | 72  | 99%                                  | 1.30%                                    | 93   | 91  | 18   | 32                  |
| AT              | 4,441                            | 1.85%  | 42  | 61%                                  | 0.80%                                    | 34   | 33  | 7  | 12                  |
| PL              | 17,240                           | 7.18%  | 164   | 62%                                  | 0.82%                                    | 133  | 131   | 26   | 46                  |
| PT              | 4,480                            | 1.86%  | 43  | 64%                                  | 0.84%                                    | 36   | 35  | 7  | 12                  |
| RO              | 4,320                            | 1.80%  | 41  | 54%                                  | 0.71%                                    | 29   | 29  | 6  | 10                  |
| SI              | 1,062                            | 0.44%  | 10  | 57%                                  | 0.75%                                    | 8  | 7   | 1  | 3                   |
| SK              | 1,669                            | 0.69%  | 16  | 50%                                  | 0.66%                                    | 10   | 10  | 2  | 4                   |
| FI              | 2,877                            | 1.20%  | 27  | 57%                                  | 0.75%                                    | 20   | 20  | 4  | 7                   |
| SE              | 4,335                            | 1.80%  | 41  | 78%                                  | 1.03%                                    | 42   | 41  | 8  | 14                  |
| UK              | 29,334                           | 12.21%   | 278   | 97%                                  | 1.28%                                    | 355  | 348   | 70   | 122                 |
| <b>EU TOTAL</b> | <b>240,265</b>                   | <b>100.00%</b>                                     | <b>2,280</b>                                | <b>76%</b>                           | <b>1.00%</b>                             | <b>2330</b>  | <b>2280</b>                                   | <b>456</b>   | <b>800</b>          |

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