Clean Power for Transport initiative

An EU sustainable alternative fuels strategy including the appropriate infrastructure

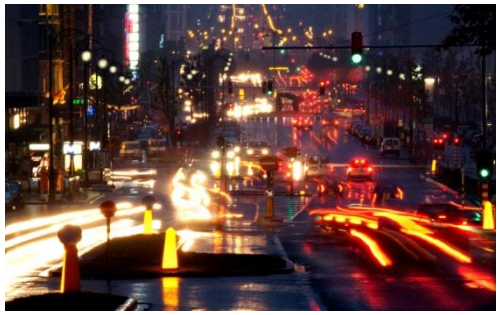
Main problems to fix

Energy supply at risk:

Transport - largest oil consumer: 55% and rising
Oil counts for 94% of transport fuels, 84% imported
New oil reserves expensive

High oil import bill:

Up to € 1 billion per day in 2011
Trade balance deficit: ~ 2.5 % of GDP
7% of household expenditure



Oil price ($/bl)

Speculative bubble 2007-2008: Cost for EU transport = **90 b€**
North-Africa unrest 2010-2011: Cost for EU transport = **40 b€**

Sustainable transport

CO2 emissions from transport:

30% of total CO2 emissions from the EU economy in 2009

Increased by 34% between 1990 and 2009

GHG emissions reduction from transport of 60% by 2050

- Large-scale deployment of low-CO_2 alternative fuels can contribute significantly
- Alternative fuels, together with increased transport efficiency, are indispensable

Clean fuels are also beneficial in urban areas

Competitiveness / Growth and jobs

Risk for the EU industry:

Loss of world leadership

- Market opportunities for **European industry** – support for innovative sectors where EU companies are leading

- If the **EU** acts as a **first-mover**, global competitiveness of EU vehicles, vessels and relevant infrastructures industries will be enhanced

- **Employment creation** in a wide range of sectors in the EU (construction, manufacturing, electricity, ICT technology and applications, advanced materials)

What is the current situation?

Important efforts to promote alternative fuels by some Member States and industry,

but:

Different technological choices lead to:

- **Isolated** national/regional markets
- **Fragmentation** of the internal market for alternative fuels
- Technology "border lines", which **inhibit mobility** with alternative fuels across Europe

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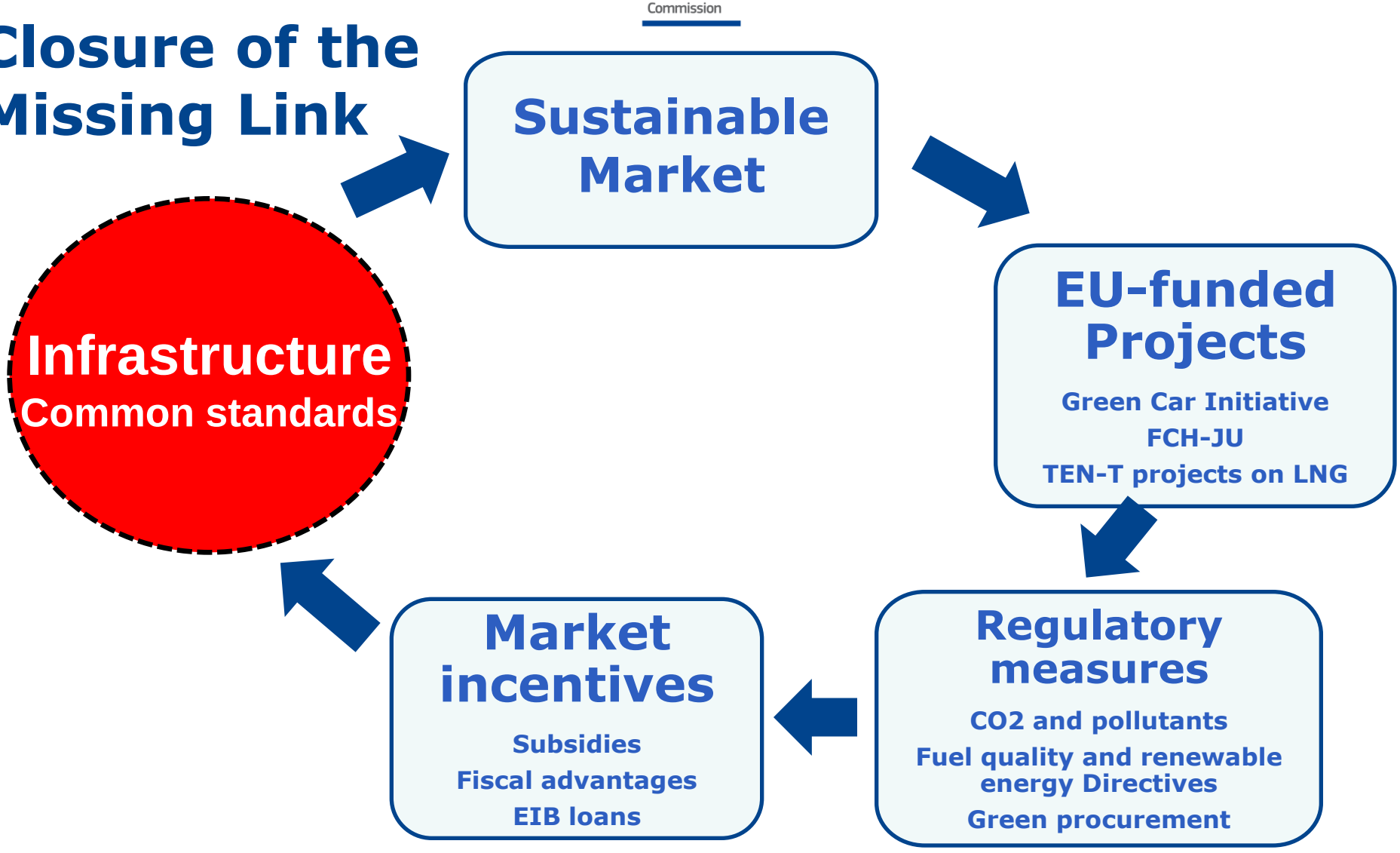
Closure of the Missing Link



What is the EC response?

The Clean Power for Transport Package will contribute to:

- Build a competitive, resource efficient and sustainable transport system in the EU
- Establish a long term fuel strategy
- Remove technical and regulatory barriers across the EU
- Facilitate the development of a single market for alternative fuel infrastructure and alternative fuel vehicles and vessels

Clean Power for Transport initiative

- **Communication “A European alternative fuels strategy”**

- **A proposal for a Directive on the deployment of alternative fuels infrastructure**

  Focusing on the "missing link" - infrastructure and standards

- **Staff Working Document on Actions towards a comprehensive framework on LNG for shipping**

The Communication

- a comprehensive alternative fuels strategy for the **long-term substitution of oil** as the primary energy source for transport
- a framework to **guide investments** and **technological development**
- Single-fuel solution is not possible **=>** ***a package of alternative fuels***

- **Priority actions**
  - **For infrastructure with common standards**
  - **For technology development**
  - **For consumer acceptance**

WE CONTINUE ON ALL FRONTS!

TEN-T and R&D projects

- Horizon2020
- European Green Vehicles Initiative
- Smart Cities initiative
- LNG projects

Etc.

A legislative proposal for infrastructure build-up, with common standards

- **Obligation of means** (national policy frameworks + EC assessment and recommendations)
- **Obligation of results** (minimum infrastructure)
  - **Conservative approach; no disproportionate targets**

  => would help MS to reach their projections
- A proposal developed in **close consultation with MS and industry**
- **A network approach/creation of economies of scale**
- Unlock private investment = **a pro-growth initiative**
- **Flexibility = Full freedom** given **to MS for implementation**
- **EU support** offered

Infrastructure build-up by 2020

- Minimum number of **recharging points for EVs** reaches set values per MS, with at least 10% publicly accessible
- **Hydrogen refuelling points** to connect those already existent in MS, with maximum distances of 300 km
- **LNG refuelling points for waterborne vessels** in all maritime ports and inland ports of the TEN-T Core Network, by 2020, respectively 2025
- **LNG refuelling points for road transport vehicles** along the TEN-T Core Network with a maximum distance of 400 km
- **CNG refuelling points** with maximum distances of 150 km to allow the circulation of CNG vehicles

The proposed Directive creates:

the conditions to establish a single market and economies of scale

=> Confidence for investors & consumers

Stable framework including minimum infrastructure

- Investments encouraged

EU common standards

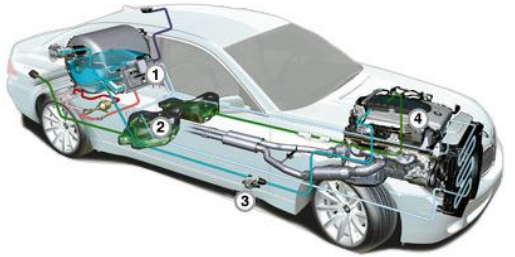
- Interoperability

Consumer information

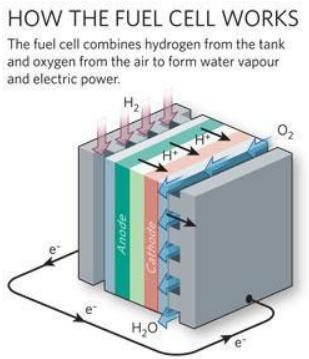
- Fuel / vehicle compatibility

Advantages of Hydrogen

- ✓ **Can be produced from any primary energy source**, uncoupling the vehicle fuel from the energy source
- ✓ **Production through electrolysis and other renewable sources** can contribute significantly to the decarbonisation of transport
- ✓ **When used in fuel cells**, delivers a clean, energy efficient, zero-emission and low noise fuel
- ✓ **Refuelling is relatively straightforward** and doesn't take much more time than with fossil fuels



Disadvantages of Hydrogen



- ✓ The **fuel cell is expensive** (=> high vehicle cost => low demand)
- ✓ **Hydrogen takes space** and is stored compressed, so the filling tank is large and heavy

- ✓ **Compressing hydrogen consumes energy**

=> Research to use hydrogen in liquid form

- ✓ **Safety risk** (H2 + O2 can lead to explosion)

Current State of Development

- ✓ Very **limited to date**
  - ✓ A few thousands vehicles, mainly demonstration (cars, buses, two-wheelers)
  - ✓ Around 500 fuelling stations active worldwide
- ✓ Major OEMs including Daimler, Toyota, Honda, GM, Hyundai, Nissan
- ✓ Germany, Japan, Korea and US lead - with China and India making early moves
- ✓ In the EU, Scandinavia, UK and Italy are also active

Fuel Cells and Hydrogen Joint Undertaking

- ✓ The FCH-JU is a **Public-Private Partnership** research and innovation initiative; it started activities in 2009
- ✓ It is working to **accelerate the commercial deployment** (improve performance, reduce costs) of fuel cells and hydrogen for both stationary and transport applications
- ✓ **31 projects** have been initiated so far with a few already reaching completion
- ✓ The FCH-JU is also conducting **ad-hoc researches** such as on comparing power trains for cars and for buses and on the refuelling network

Clean Power for Transport Package

1) Sets targets to build the necessary hydrogen refuelling points

"Member States on the territory of which exist already at the day of the entry into force of this Directive hydrogen refuelling points, shall ensure that a sufficient number of publicly accessible refuelling points are available, with distances not exceeding 300 km, to allow the circulation of hydrogen vehicles with the entire national territory by 31 Dec 2020"

Clean Power for Transport Package

2) Set standards to ensure interoperability across the EU

"All hydrogen refuelling points for motor vehicles shall be compliant with the technical specifications set out in Annex III.2 by Dec 2015"

Refuelling stations

Country	Existing public	Existing non public	To make public	To build	Total	Cost to build
	a	b	c	d	a+c+d	for d
AT	2			4	6	6.4
BE	1			3	4	4.8
BG		7	7		7	
CY		1	1		1	
CZ	1			4	5	6.4
DE	33	9			33	
DK	3	11			3	
EE		3	3		3	
EL	2			6	8	9.6
ES	7			18	25	28.8
FI	2			6	8	9.6
FR	5			19	24	30.4
HU		5	5		5	
IE		4	4		4	
IT	18	3			18	
LT		4	4		4	
LV		5	5		5	
NL	4				4	
PL		21	21		21	
PT		4	4		4	
RO		9	9		9	
SE	4			17	21	27.2
SI	2				2	
SK		4	4		4	
UK	17	2			17	
TOTAL	101	92	67	77	245	123

- ✓ Currently about 200 refuelling stations in the EU, of which 101 publically accessible
- ✓ Targets of the CPT Package can be met by
  - ✓ Making an additional 67 existing stations public; and
  - ✓ Building an additional 77 stations, publically accessible; this requires about €123 millions

=> A network for hydrogen vehicles will be created in **France, Germany, Italy, Poland, Spain, Sweden and UK**

Standards

- ✓ EU regulatory framework exists for whole-vehicle type approval of hydrogen cars, buses, trucks, scooters
- ✓ On-going efforts to establish a UN Global Technical Regulation for vehicle approval
- ✓ ISO and SAE standards exist with globally harmonised requirements for hydrogen purity, fuel connectors, refuelling station safety and layout
- ✓ **Standards still needed for certain components**: fuel hoses, permitting for fuel stations, trans-filling and fuel dispenser, vehicle tank information protocols

Standards – CPT Annex III.2

- ✓ 2.1 **Outdoor hydrogen refuelling points** dispensing gaseous hydrogen used as fuel on board land vehicles shall comply with the relevant EN standard (European standard, CEN) to be adopted by 2014 and, pending the publication of this standard, with the technical specifications of the ISO/TS20100:2008 Gaseous Hydrogen Fuelling specification
- ✓ 2.2 The **hydrogen purity** dispensed by hydrogen refuelling points shall comply with the relevant EN standard to be adopted by 2014 and, pending publication of this standard, with the technical specifications included in the ISO 14687-2 standard
- ✓ 2.3 Hydrogen refuelling points shall employ **fuelling algorithms and equipment** complying with the relevant EN standard to be adopted by 2014 and, pending the publication of this standard, with the ISO 20100 Fuelling Protocols for Light Duty Gaseous Hydrogen Surface Vehicles
- ✓ 2.4 **Connectors for vehicles for the refuelling of gaseous hydrogen** shall comply with the relevant EN standard to be adopted by 2014 and, pending publication of this standard, with the ISO 17268 gaseous hydrogen land vehicle refuelling connection devices standard

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Thank you for your attention!