La route du future: faire mieux avec moins!

by ***Thierry GOGER***
FEHRL Secretary-General

Les enjeux majeurs de la mobilité durable

1. **Economie et énergie**

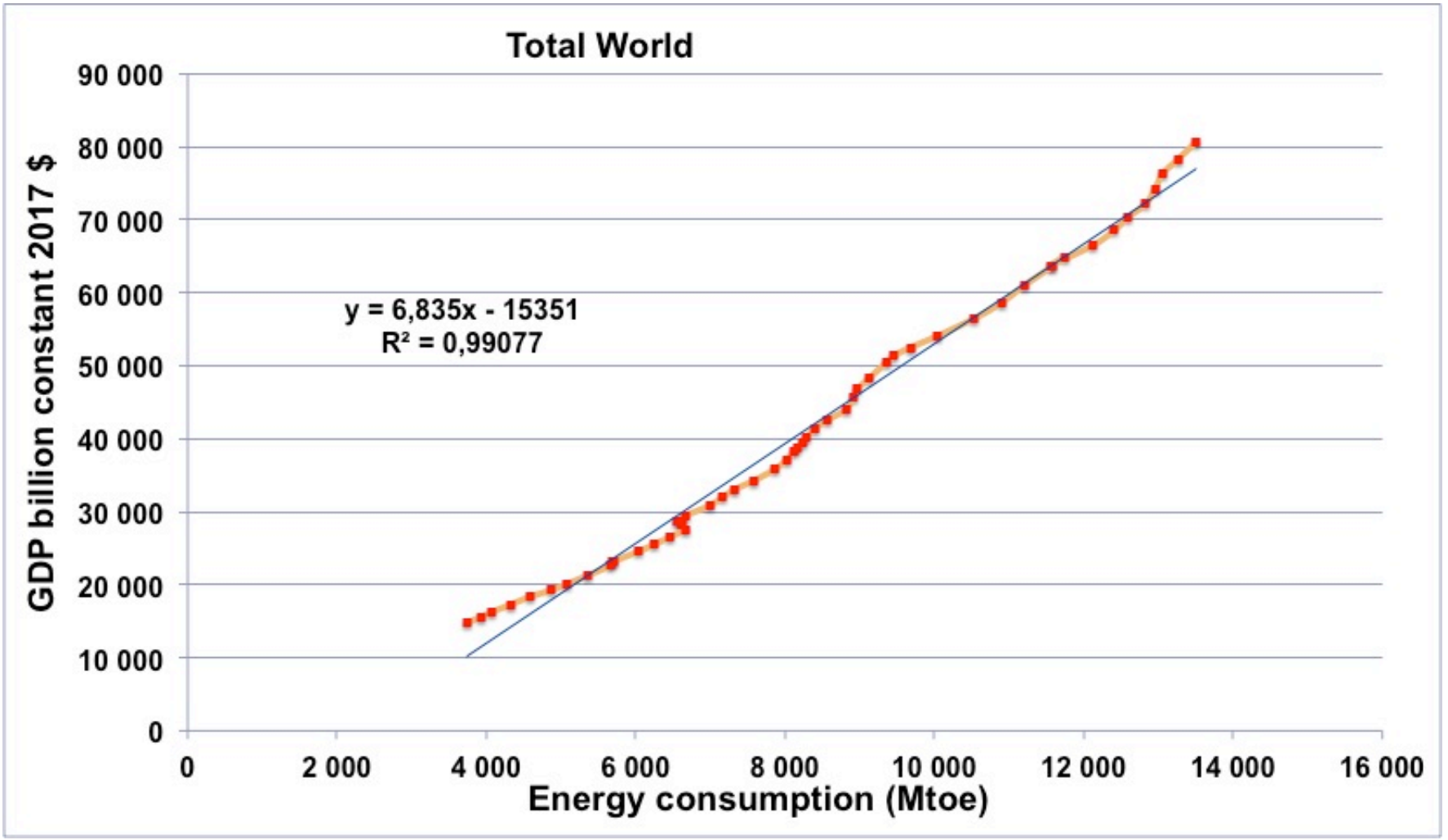
2. **Horizon Europe**

3. **Innovation**

4. **Rester à l'avant garde** – les métiers et compétences en déclins ou émergents

Energie & économie

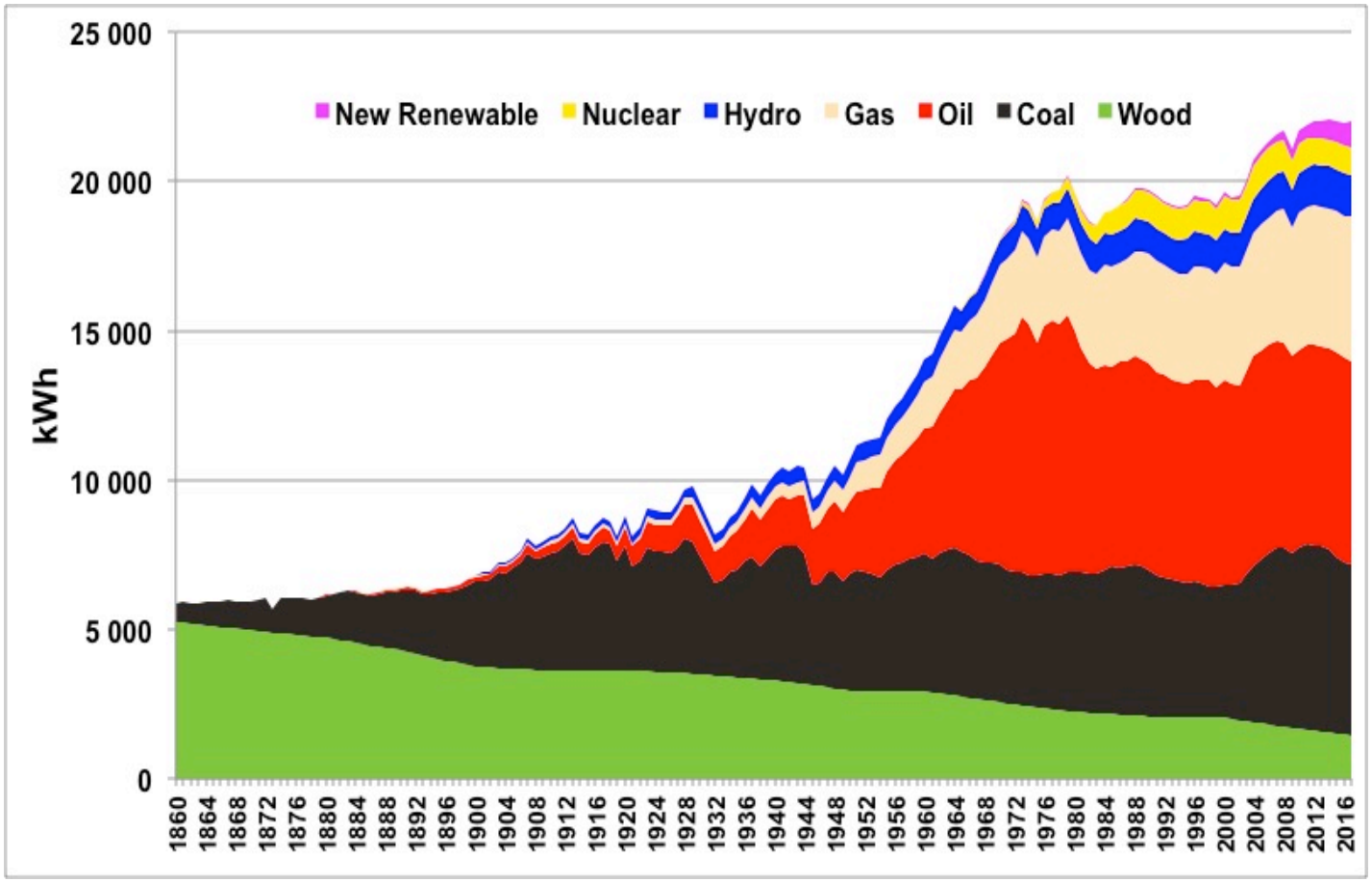
L'inféodation de l'économie à la consommation d'énergie



Source: Jacovici d'après données de BP Statistical Review, 2015, and World Bank 2015 (GDP)

Le besoin croissant d'énergie

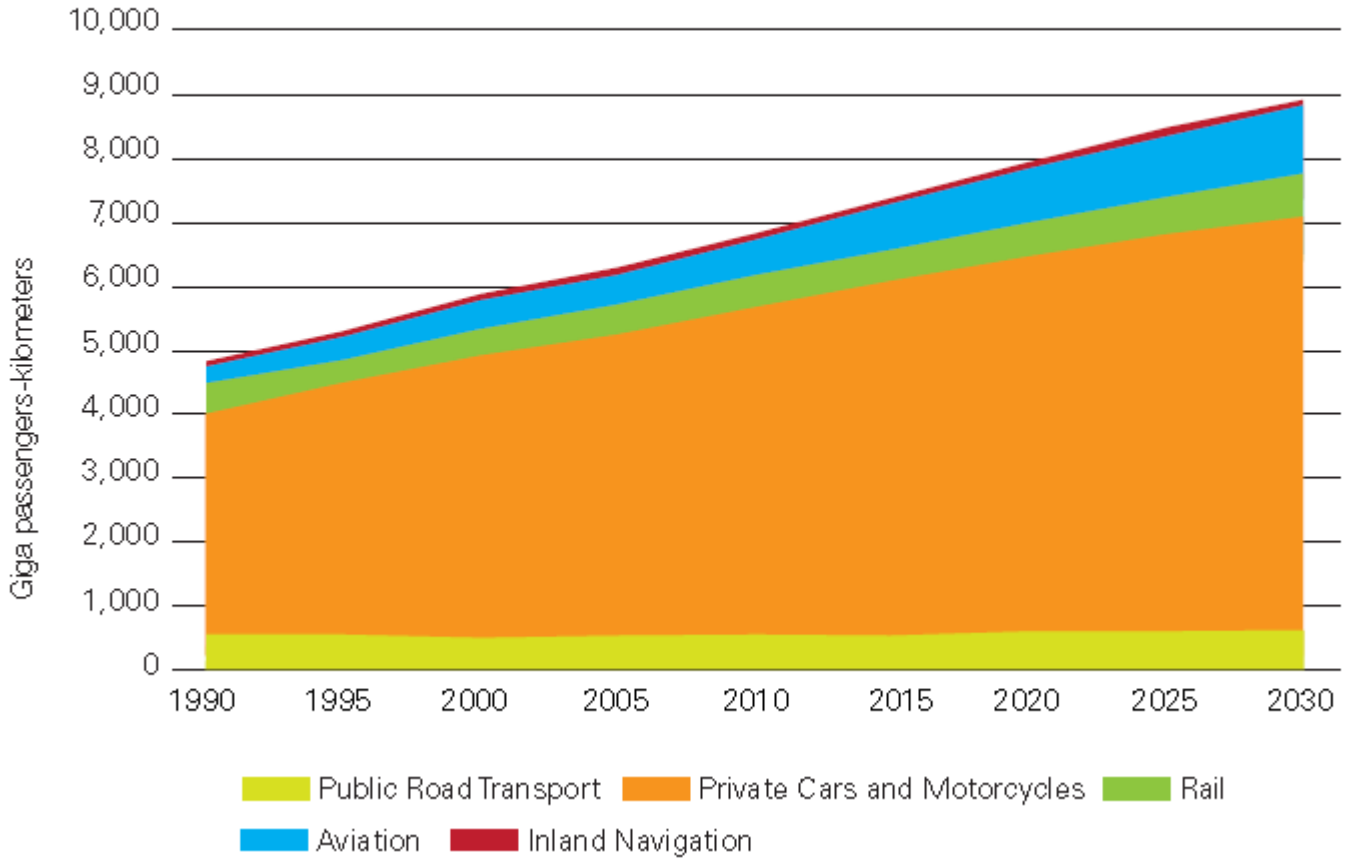
Evolution de la consommation d'énergie par personne, en moyenne mondiale, depuis 1860



Source: Jacovici d'après données de Shilling et al. 1977, BP Statistical Review 2018, Smil 2018

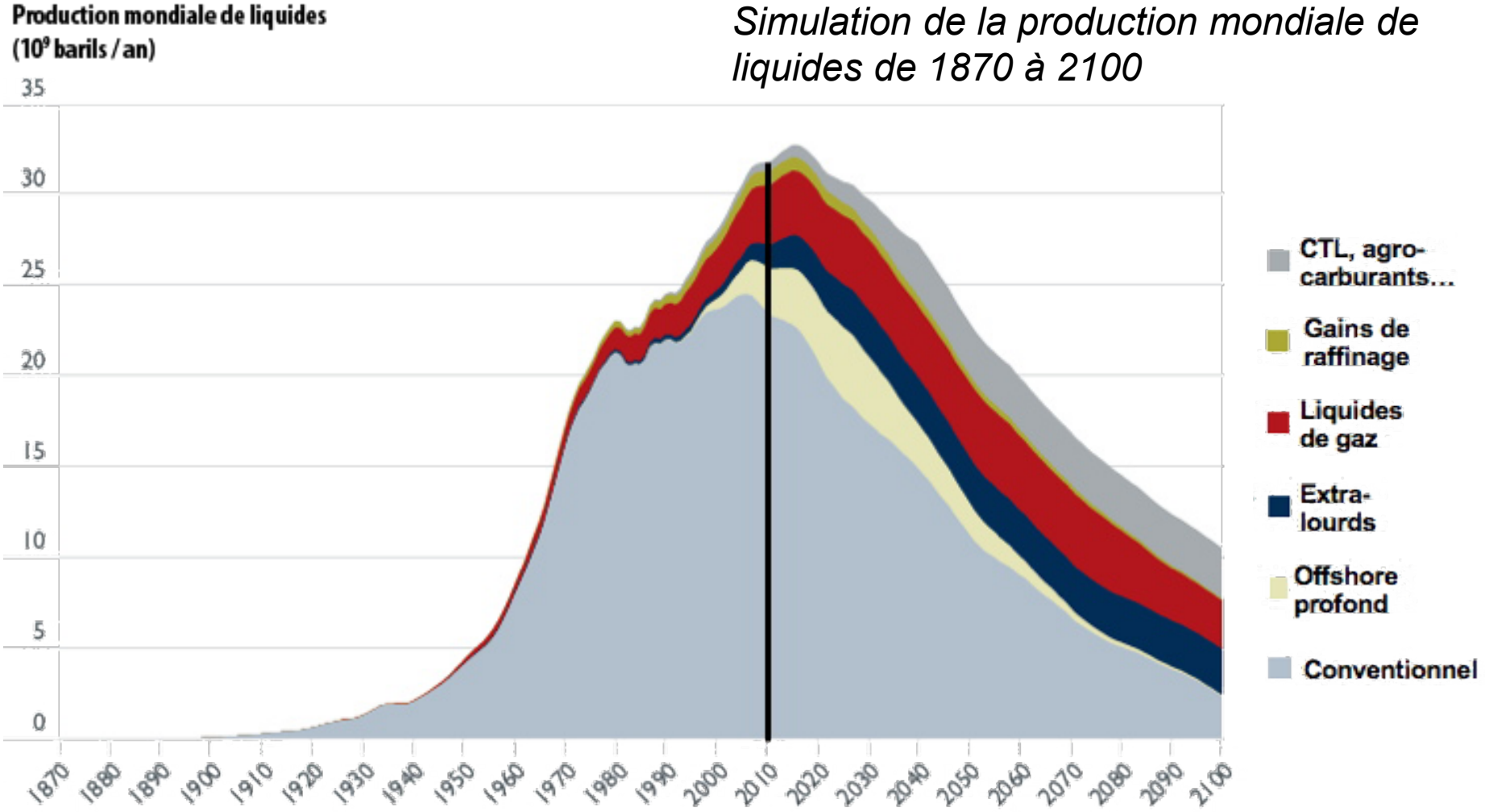
La tendance

Trends and outlooks in passanger transport demand for the different modes of transport in EU-25 - 1990-2030 – Source ERF European Road Statistics 2013



Le déclin de la production de “pétrole” (liquides)

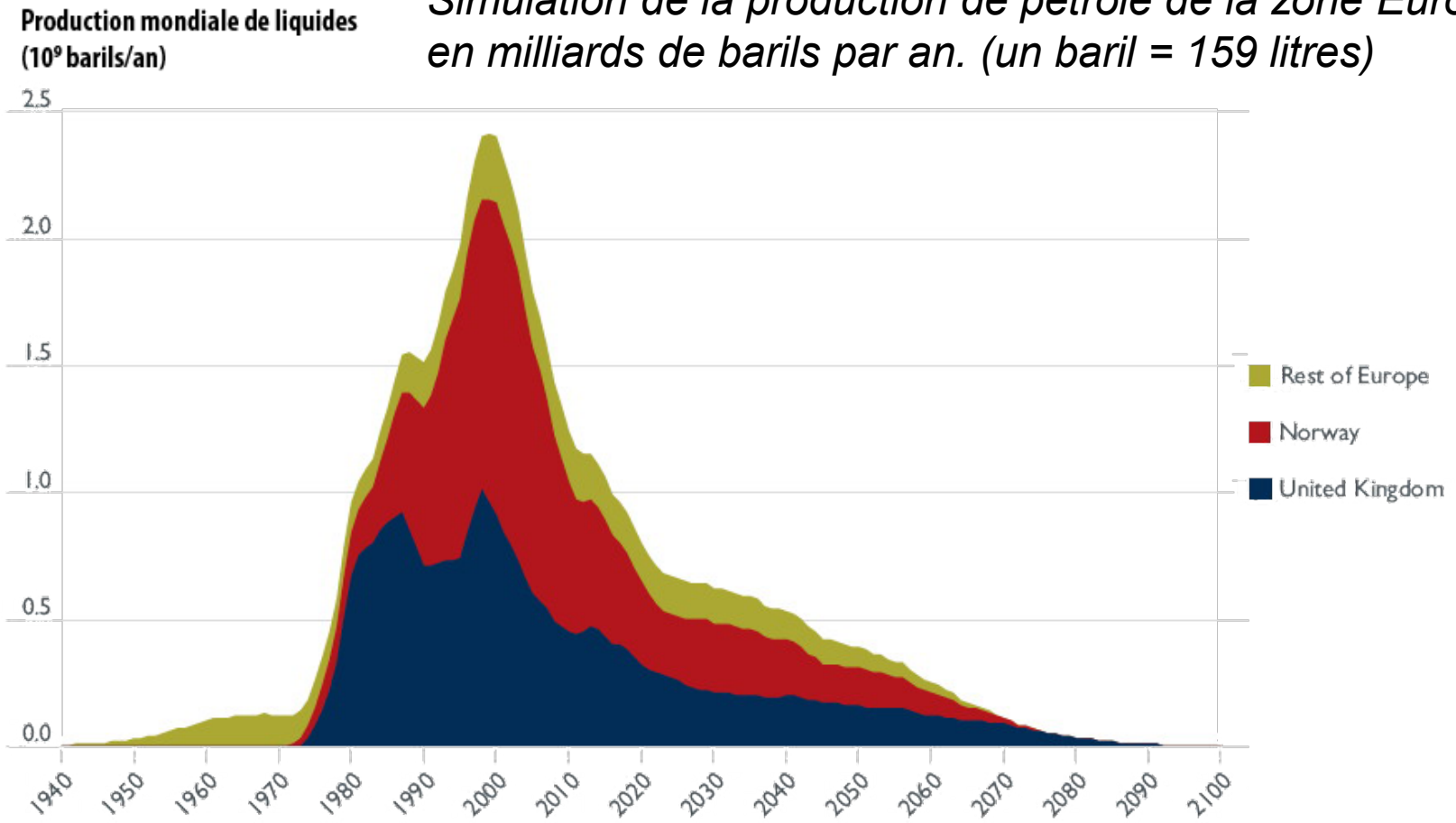
Simulation de la production mondiale de liquides de 1870 à 2100



Source: Jacovici d’après données de « Transport energy futures: long-term oil supply trends and projections », Australian Government, Department of Infrastructure, Transport, Regional Development and Local Government, Bureau of Infrastructure, Transport and Regional Economics (BITRE), Canberra (Australie), 2009

Le déclin de la production de “pétrole” (liquides)

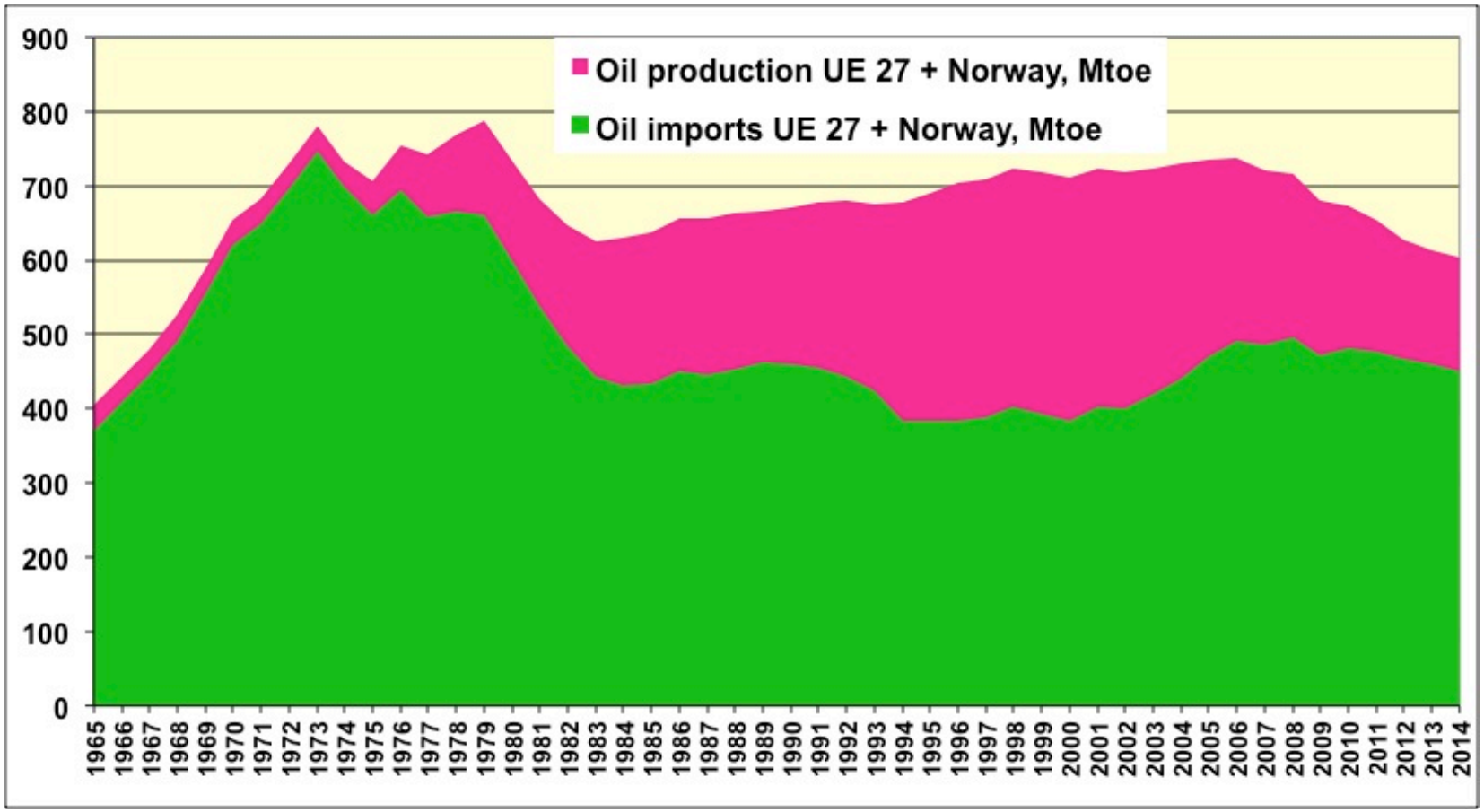
Simulation de la production de pétrole de la zone Europe en milliards de barils par an. (un baril = 159 litres)



Source: Jacovici d’après données de « Transport energy futures: long-term oil supply trends and projections », Australian Government, Department of Infrastructure, Transport, Regional Development and Local Government, Bureau of Infrastructure, Transport and Regional Economics (BITRE), Canberra (Australie), 2009

Une pression accrue sur les pays importateurs

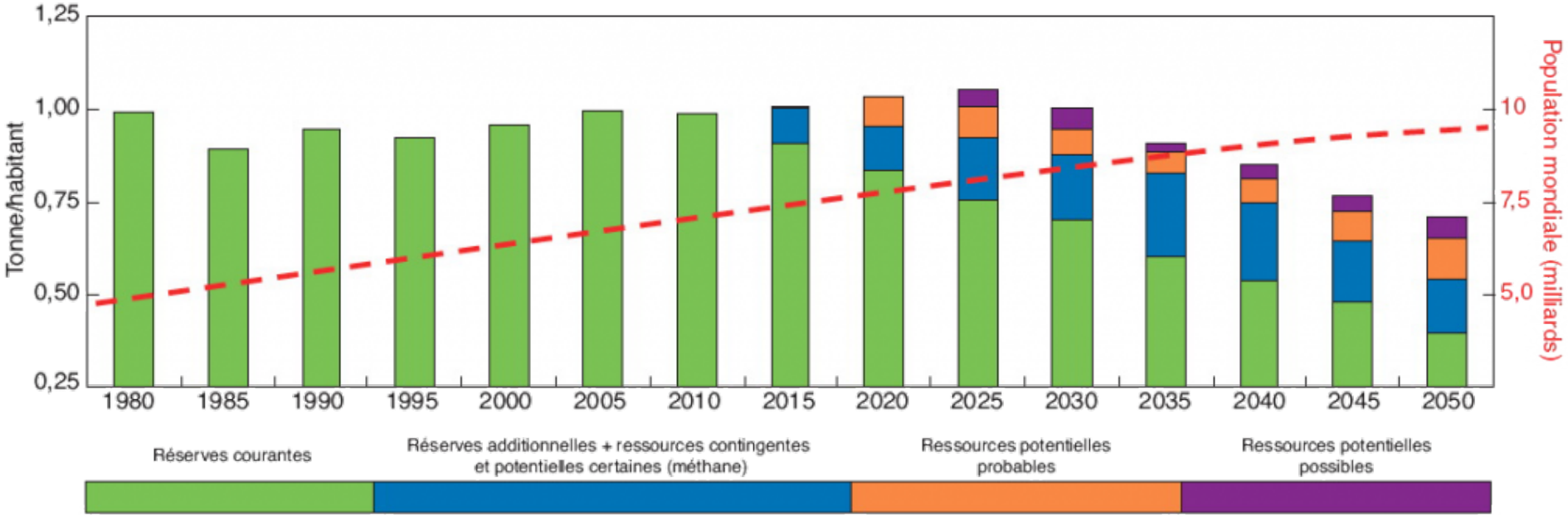
*Evolution de la production domestique de pétrole de la zone Europe (Union à 27 + Norvège), (**aire rose**), et des importations de la même zone (**aire verte**)*



Source: Jacovici d'après données de BP Statistical Review 2014

La décroissance de la disponibilité pétrole + gaz par personne

Disponibilité en hydrocarbures (pétrole et gas) par personne de 1980 à 2050



Source: Jacovici d'après Yves Mathieu, Panorama IFP 2010

New policy perspectives / objectives: post-2011 Transport White paper…

Over-arching GOAL: create a European transport system that is:

efficient
sustainable
internationally-competitive
safe
resilient
accessible
inclusive

Specific EU transport policy targets in the *2011 Transport white paper*

- 60% reduction in CO_2 emissions (against 1990 baseline)
- zero fatalities on the road network
- 50% shift in medium distance inter-city passenger trips from road to rail
- 50% of freight tonne-kms > 300k from road to rail and water

by 2050

- emission-free city logistics

One large, 'transversal' challenge: *multiple tiers of associated challenges*

Source: Horizon 2020: Transport Advisory Group

La necessaire décarbonisation de l'énergie

Kaya's equation

$$CO2 = \frac{CO2}{NRJ} \times \frac{NRJ}{GDP} \times \frac{GDP}{POP} \times POP$$

$$CO2 = \frac{CO2}{TEP} \times \frac{TEP}{PIB} \times \frac{PIB}{POP} \times POP$$

÷ 3

÷ 9 (10)

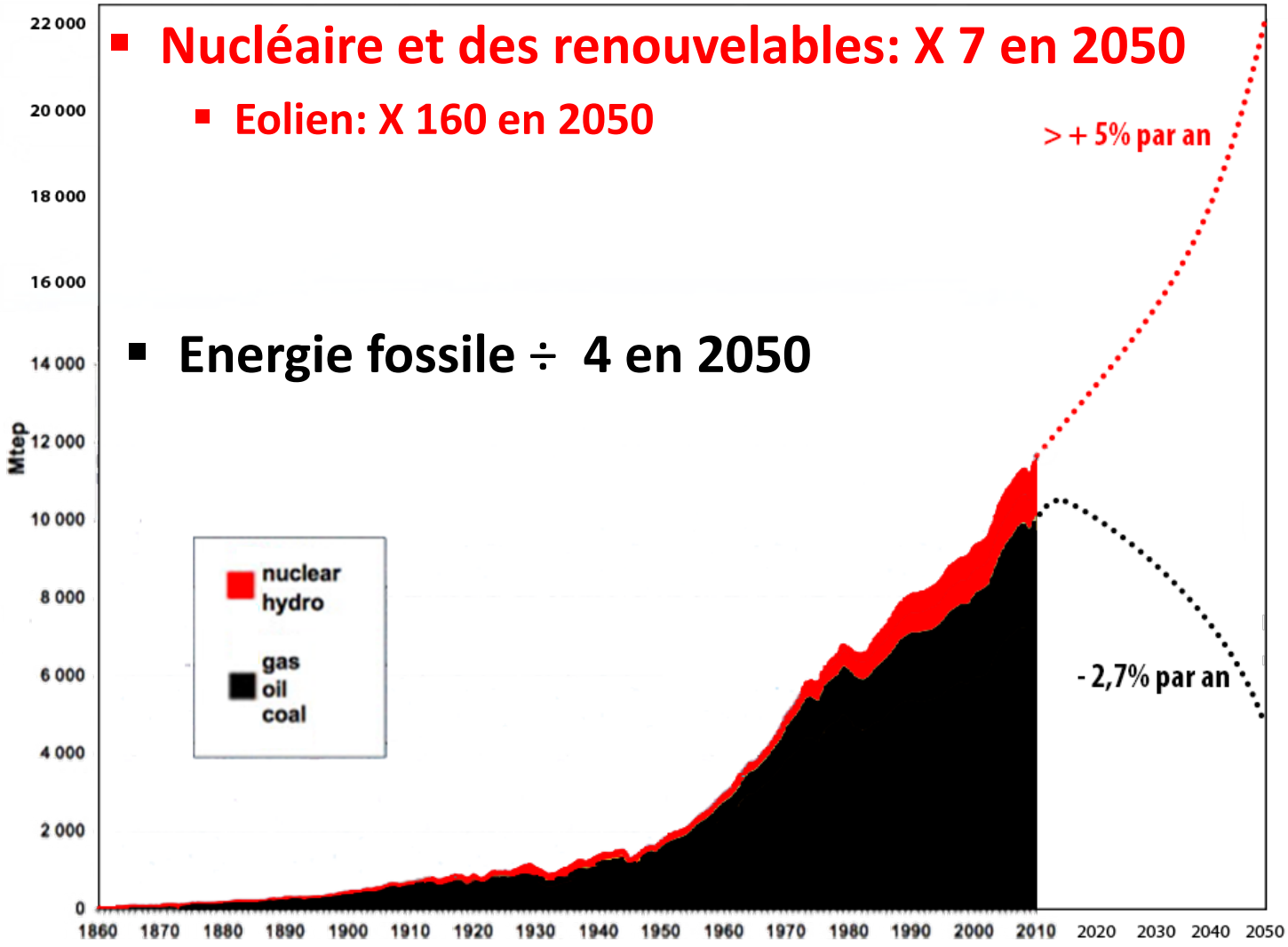
÷ 5 ÷ 2

X 2,2

X 1,3

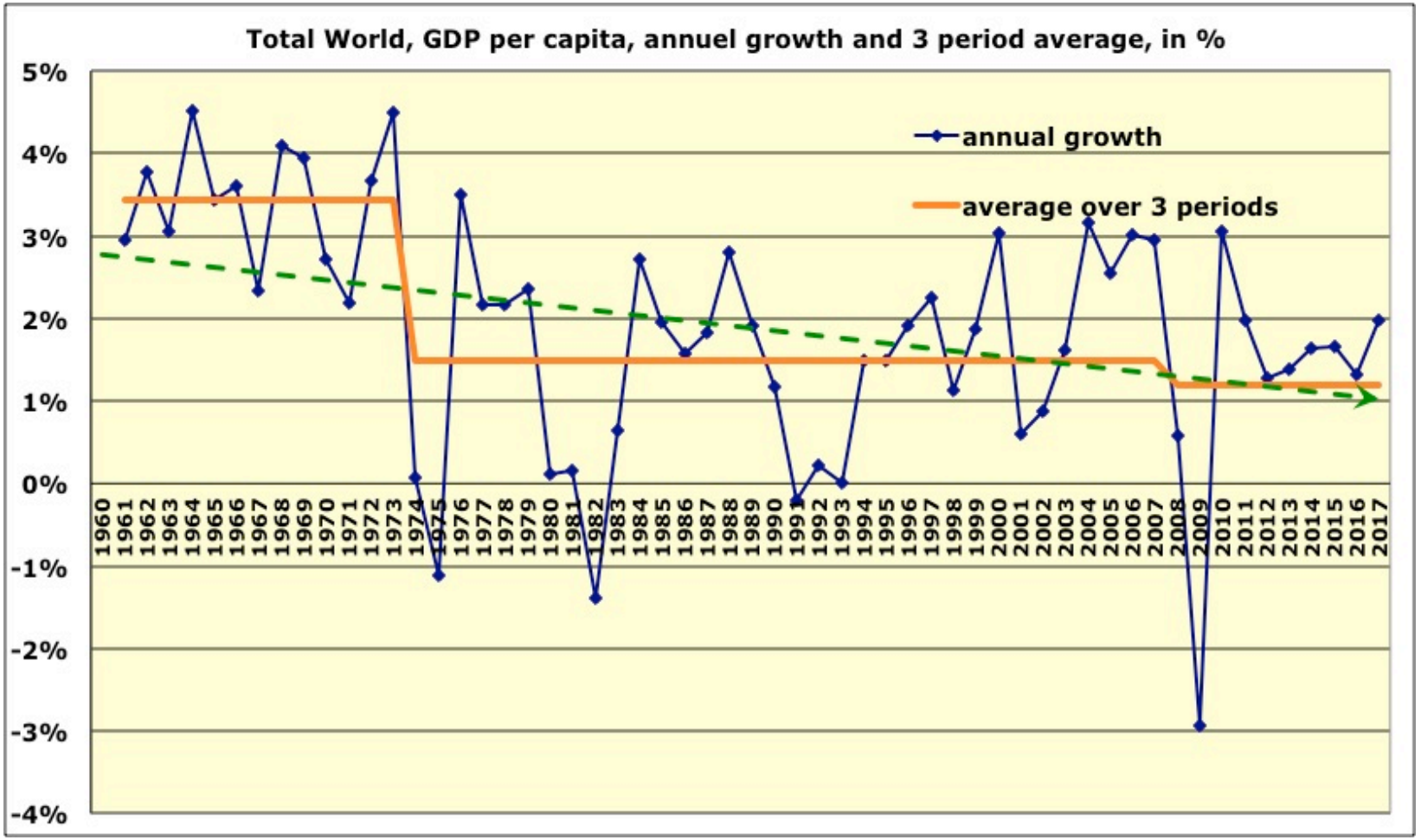
La necessaire décarbonisation de l'énergie

- **Nucléaire et des renouvelables: X 7 en 2050**
  - **Eolien: X 160 en 2050**
- **Energie fossile ÷ 4 en 2050**



Source: Jacovici d'après données de BP World Bank 2018

La récession économique…



Source: Jacovici d'après données de BP World Bank 2018

Horizon Europe

Horizon Europe - Investing to shape our future

European Commission

Our vision

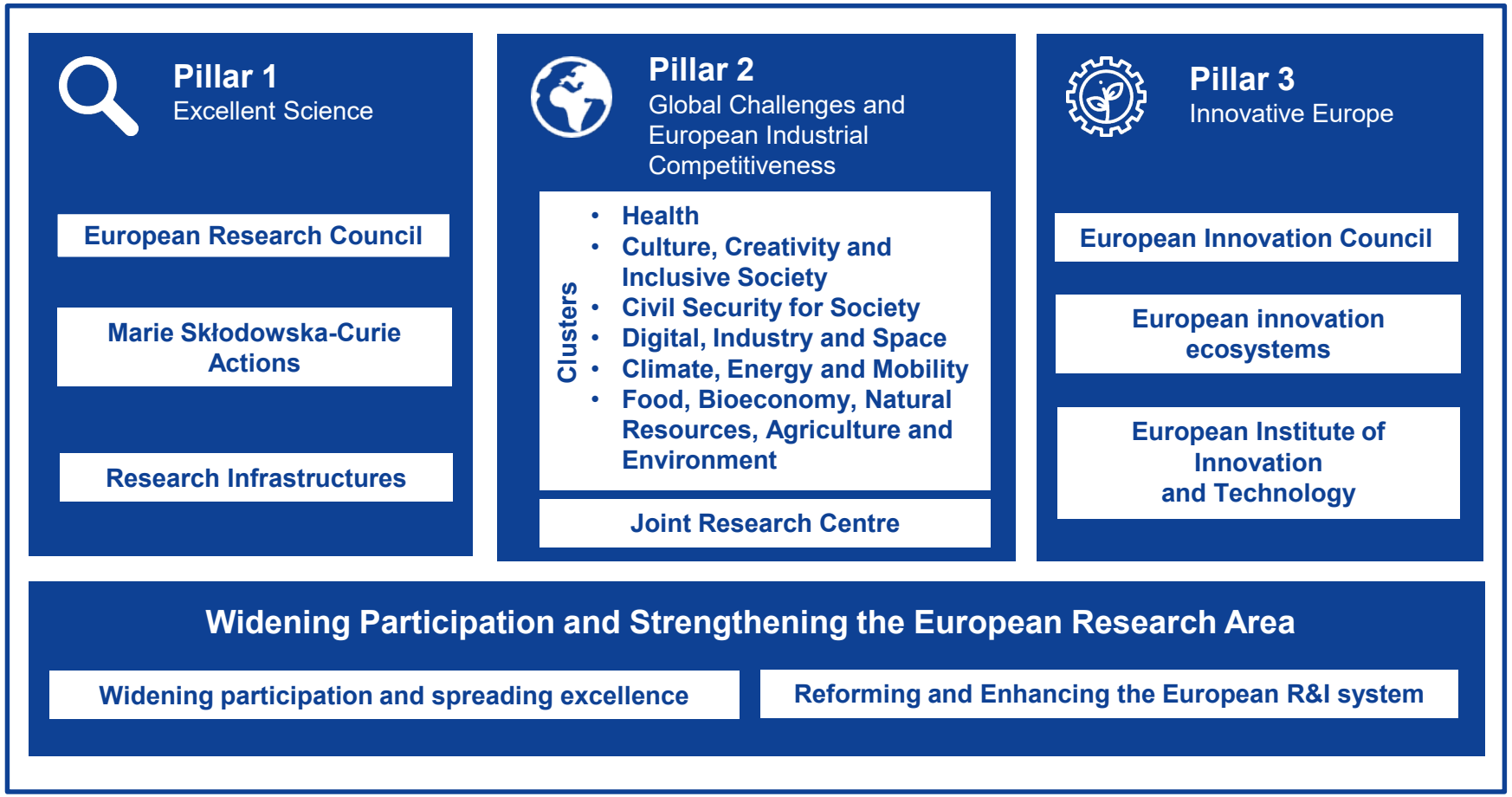
A sustainable, fair and **prosperous** future for **people** and **planet** based on European values.

- Tackling **climate change**
- Helping to achieve **Sustainable Development Goals**
- Boosting the Union's **competitiveness and growth**

Credits: https://www.un.org/sustainabledevelopment/sustainable-development-goals/

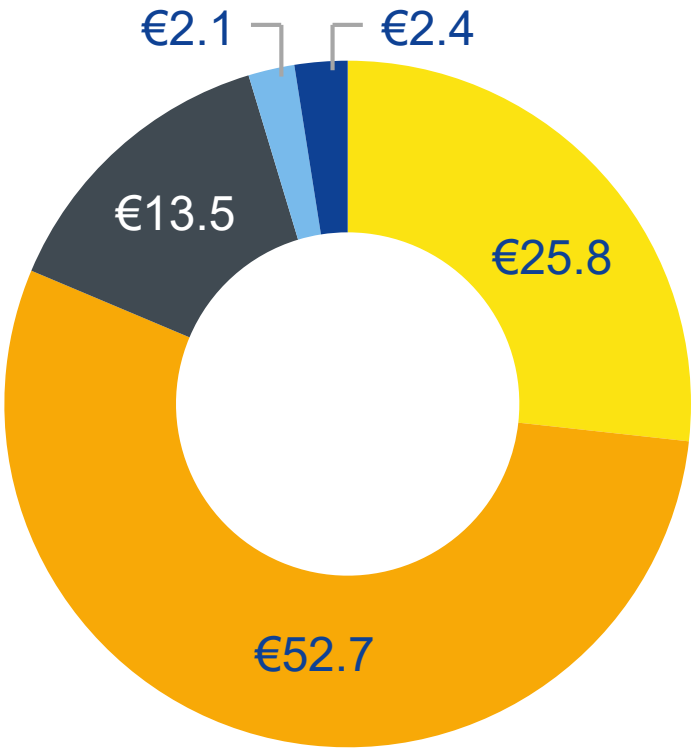
European Commission

Horizon Europe: Preliminary structure



European Commission

Commission proposal for budget: €100 billion* (2021-2027)



€ billion
In current prices

- Excellent Science
- Global Challenges & European Ind. Comp.
- Innovative Europe
- Widening Part. & ERA
- Euratom

* This envelope includes EUR 3.5 billion allocated under the InvestEU Fund.

European Commission

Adaptation to climate change, including societal transformation

Healthy oceans, seas, coastal and inland waters

Mission areas

Cancer

Climate-neutral and smart cities

Soil health and food

European Commission

Areas for possible Institutionalised European partnerships (based on Article 185/7 TFEU)

- Health innovations
- Key digital and enabling technologies
- Metrology
- EU air traffic, aviation and rail
- Sustainable bio-based solutions
- Hydrogen and sustainable energy storage
- Clean, connected mobility
- Innovative SMEs








International Cooperation

International Cooperation

Tackling together global societal challenges; access to the world's best talents, expertise and resources; enhanced supply and demand of innovative solutions

Extended openness to association

- Third countries with good capacity in science, technology and innovation
- Taking into account objective of driving economic growth in Europe through innovation

- General opening for international participation
- Intensified targeted actions
  (flagship initiatives, joint calls, etc.)

Strategic plan gives direction to the work programme

European Commission

Possible priorities for infrastructure R&I*

Develop and validate new solutions to increase efficiency, inter-modality, resistance, safety and security of the transport system, for passengers and freight. At the same time, reduce greenhouse gas emissions and improve the environmental performance of transport over the entire lifecycle of the infrastructure.

Potential research challenges:

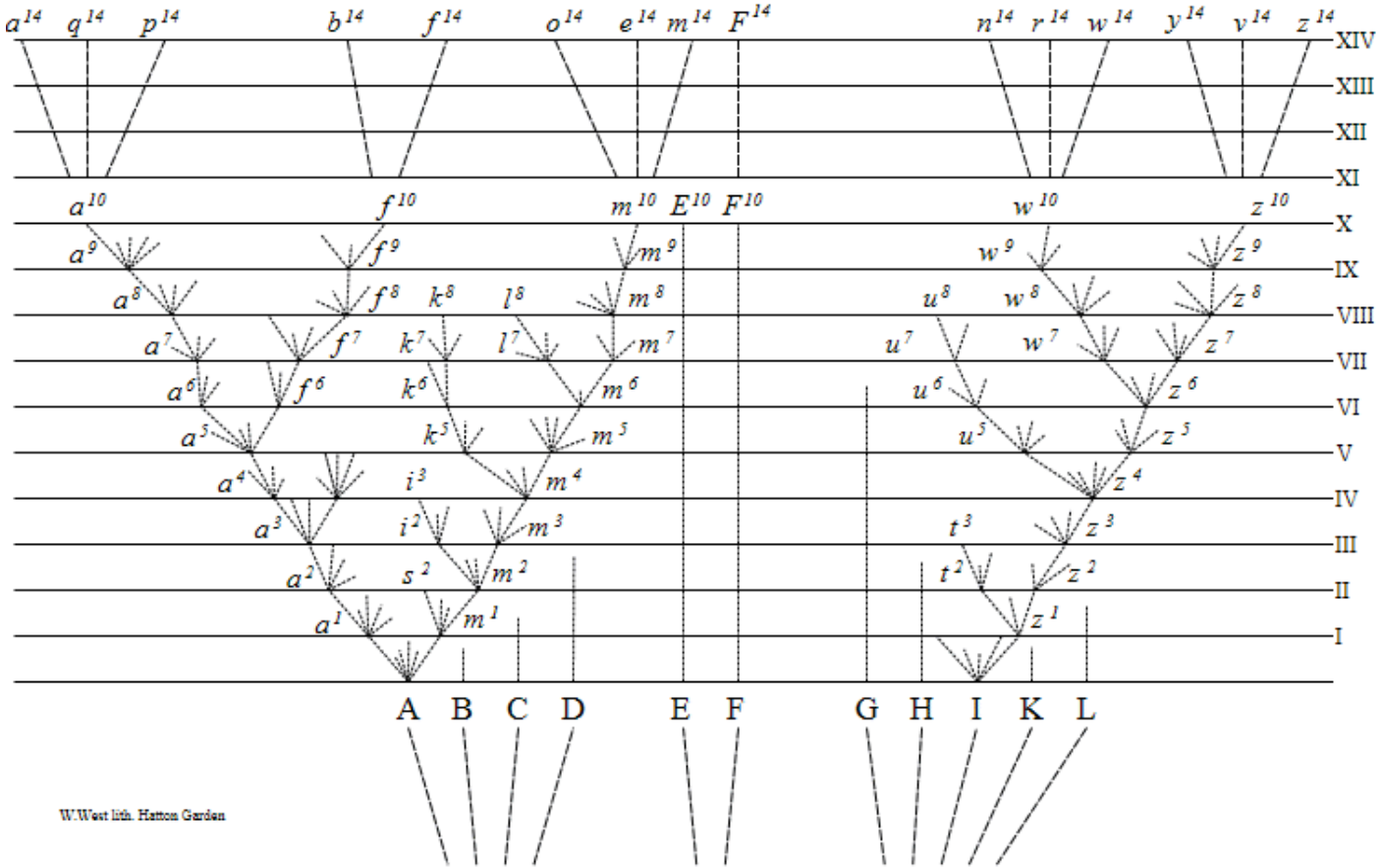
- **Develop and test new methods of transport maintenance and upgrade, improving safety, climate resilience and environmental impact;**
- **Accommodate new/evolving transport modes and better integration of transport infrastructure and energy systems;**
- **Integration of physical and secure digital infrastructure;**
- **Develop tools for information and data collection and management to monitor the performance of the infrastructure and traffic management;**
- **Develop and test governance, regulatory, and public procurement models and new contractual performance indicators and incentives to maintain and upgrade infrastructure.**

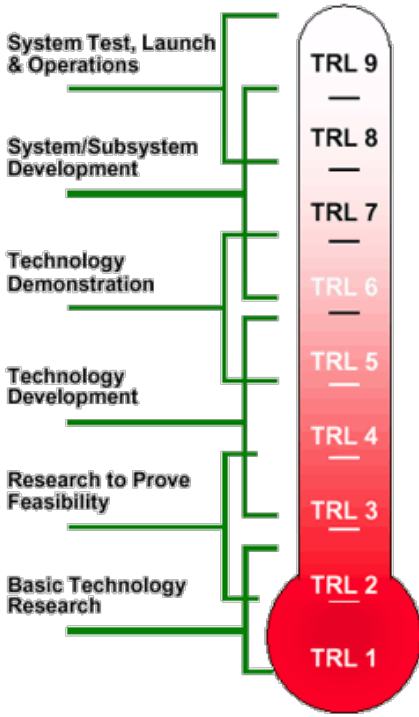
**from the consultation document for the strategic plan*

European Commission

Innovation

INCREMENTAL development of R&D&I solutions





There is no failures in R&D!

There are only trials to clear the way for success!

Innovation solutions to green our roads needs to be clearly defined

- What is the critical technology?
- Are we talking about the subcomponents, components, integrated components, or a complete system?

Greening our road needs is multi-contextual

Identifying the Operational Environment(s)

- What is the real-world combination of data, physical environmental conditions, users, etc. that could affect the technology's operation?

Demonstrations

Infravation
An Infrastructure Innovation Programme

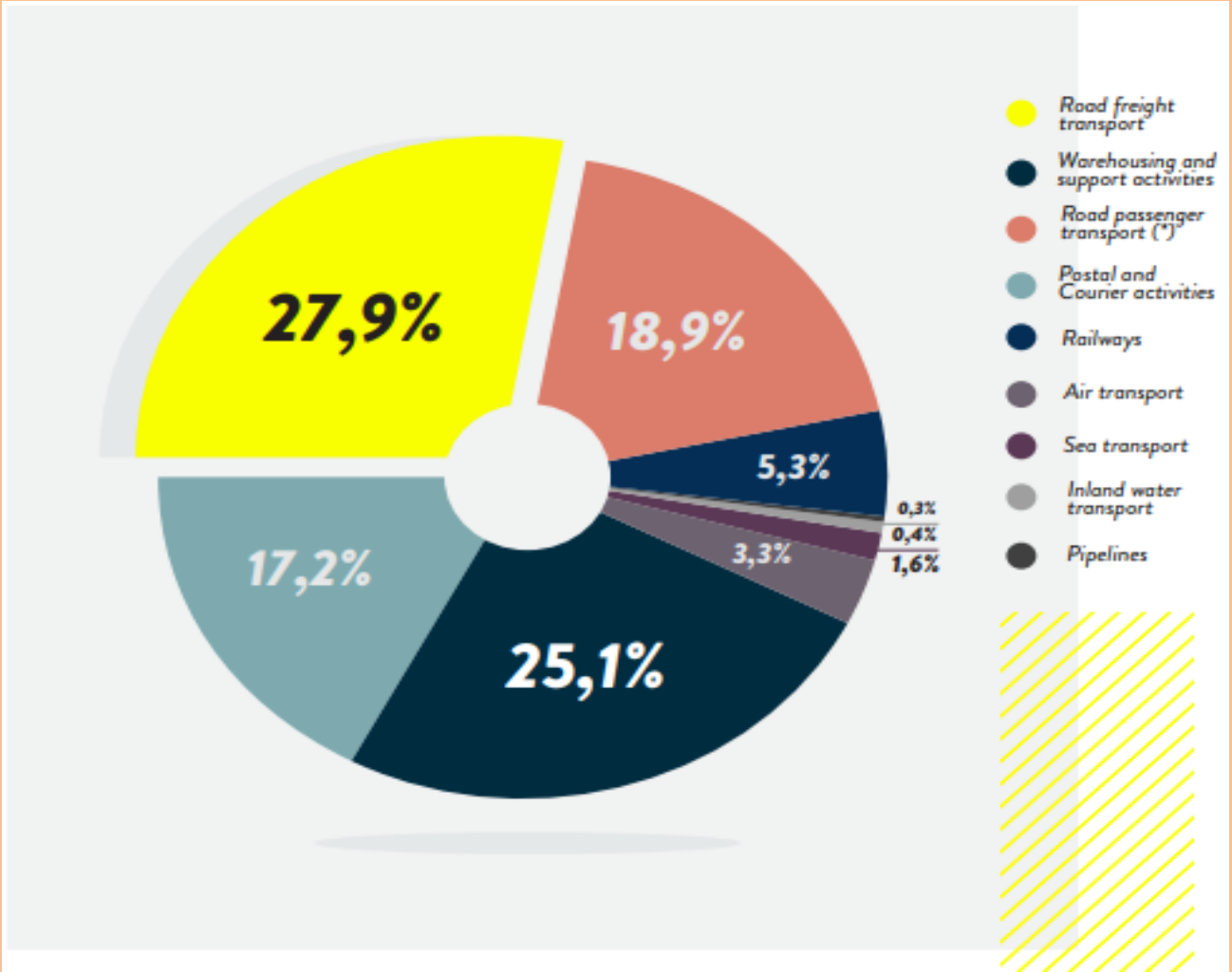
OVERVIEW OF **INFRAVATION** PROJECT DEMONSTRATION ACTIVITIES

3-4 MAY	SeaNeA	TAMPA, FLORIDA	**26 OCTOBER**	HEAL ROAD	BAST/COLOGNE, GERMANY
6 JULY	BioRePavation	IFSTTAR/NANTES, FRANCE	**7 NOVEMBER**	FASSTbridge	MADRID, SPAIN
1 SEPTEMBER	SURE BRIDGE	CHALMERS/GOTHENBURG, SWEDEN	**EARLY 2018**	ECLIPS	DELFT, NETHERLANDS
18 SEPTEMBER	SEEBRIDGE	CAMBRIDGE, UNITED KINGDOM TEL AVIV, ISRAEL ATLANTA, USA	**EARLY 2018**	ECLIPS	ARIZONA, USA
22 SEPTEMBER	SURE BRIDGE	PISA, ITALY	**27 FEBRUARY 2018**	AlterPave	MILAN, ITALY
25 SEPTEMBER	SEEBRIDGE	MUNICH, GERMANY	**12-13 MARCH 2018**	sHAPE	BOLOGNA, ITALY

Demonstrate that their innovative solutions work in test environment

Rester à l'avant garde – les métiers et compétences en déclins ou émergents

- The transportation and storage services sector accounted for **8.0 % of the total workforce** in the EU in 2016.



- Road Freight & Passenger transport cover **almost the 47%** of the total transport employment in EU Member States.

Road Transport Jobs 2020

Logistic Companies

Machine Operators

Fuel Station Operators

Customer Service Personnel

Infrastructure Operators

TMC Operators

Traffic Violation Officers

Driving Instructors

Manufacturing Staff (OEM, Tier 1/2/3, Suppliers)

PT Operators

Transport Services Providers

Drivers

Booking & Travel Agencies

Parking Operators

Rent a Car

Ticket Issuers & Controllers

Road Transport Jobs 2035

Merci de votre attention et de votre aimable invitation!

More information at www.fehrl.org