

# Legal Requirements for Hydrogen Road Vehicles in Europe

1<sup>st</sup> European Hydrogen Energy Conference  
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Roundtable "Daily use of hydrogen: safety,  
codes and regulations" on 3 Sept. 2003

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# Hydrogen Fuelled Vehicles - Challenges to be Resolved



# Reasons for Developing European Harmonised Legal Requirements

- Some 47 directives have to be applied in order to receive an approval for a road vehicle in Europe. If a vehicle is successfully tested according to these 47 EC directives or equivalent ECE regulations it has to be approved. The result is a Whole Vehicle Type Approval.
- If approval is sought for a hydrogen vehicle, emissions, fuel consumption and engine power cannot be tested according to the existing directives/ regulations. The reason is mainly the absence of a standardised reference fuel or the absence of a test procedure and the absence of corresponding EC directives respectively ECE regulations.
- Some other directives can be fulfilled formally, but from the technical point of view they should be revised for hydrogen vehicles.
- Some requirements regarding the safety of the hydrogen on-board storage systems are missing in the existing directives.



# Legal Situation for Approval of Road Vehicles in Europe

## List of directives/ regulations to be amended for road vehicles

<u>Subject</u>	<u>EEC-Directive/ECE-Regulation</u>
1. Emissions	70/220/EEC incl. latest amendment & ECE R83
2. Fuel tanks/rear protective device	70/221/EEC incl. latest amendment & ECE R34/58
3. Diesel smoke	72/306/EEC incl. latest amendment & ECE R24
4. Identification of controls	78/316/EEC incl. latest amendment
5. Fuel consumption	80/1268/EEC incl. latest amendment & ECE R 101
6. Engine Power	80/1269/EEC incl. latest amendment & ECE R84
7. Diesel emissions	88/77/EEC & ECE R49
8. Side impact	96/27/EC & ECE R95
9. Frontal impact	96/79/EC & ECE R94
10. Roadworthiness tests	96/96/EC & PTI
11. CO2 labeling	99/94/EC
12. Base Directive	70/156/EEC incl. latest amendment
13. Electric Vehicles	NEW EC Directive & ECE R100
14. Defrost/Demist	78/317/EWG (already under progress)



# Why Develop a New Regulation for Hydrogen Road Vehicles ?

The path of Council Directive No 98/14/EC, article 8(2)c,  
to approve hydrogen fuelled vehicles:



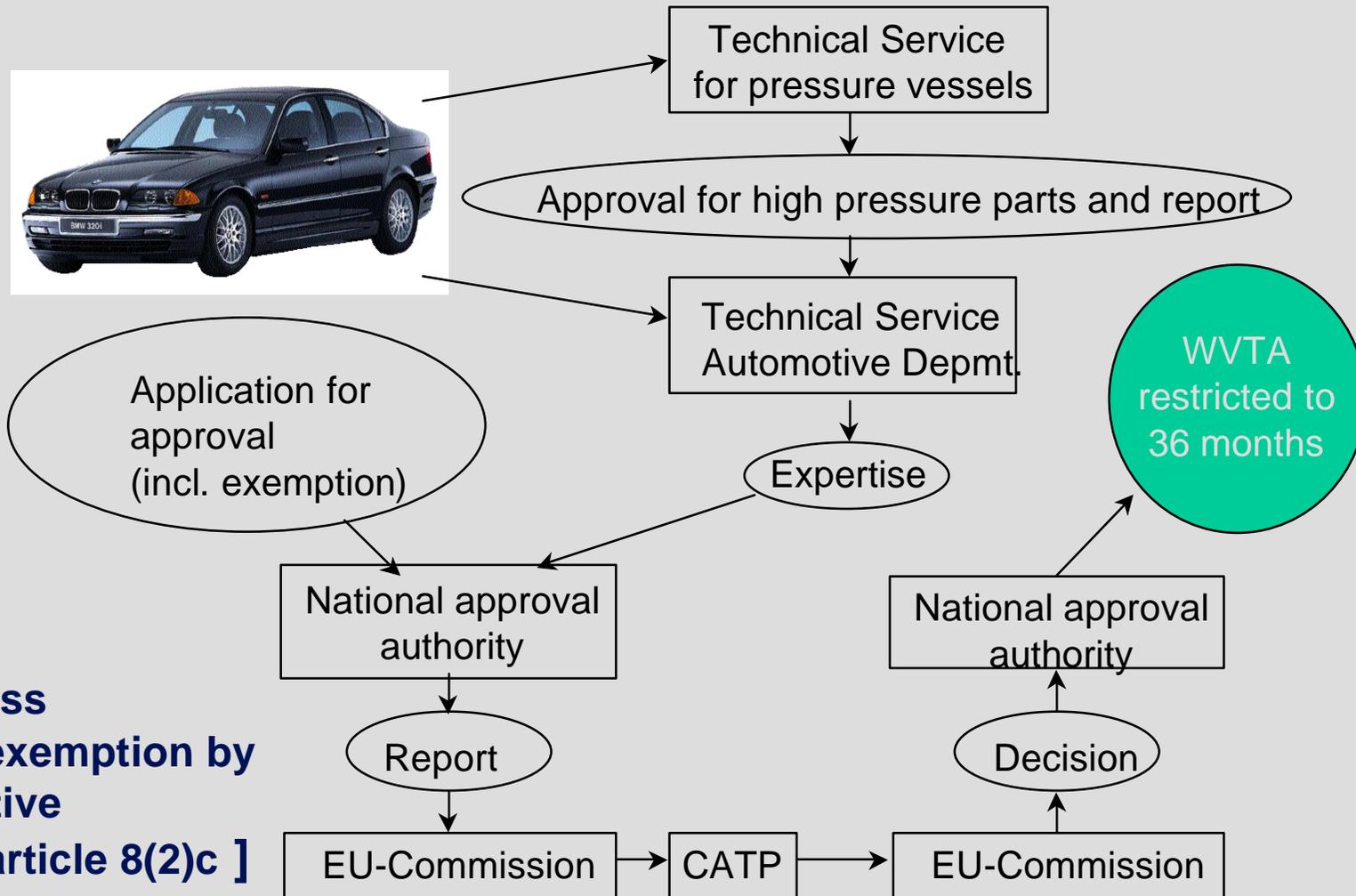
- ✓ Excessive amount of time required
- ✓ Uncertainty of the outcome of the process up until the very end



 **A draft regulation for hydrogen vehicles should be developed**



# Application for a European Whole Vehicle Type Approval (WVTA)



**[Current process according to exemption by Council Directive No 98/14/EC, article 8(2)c ]**

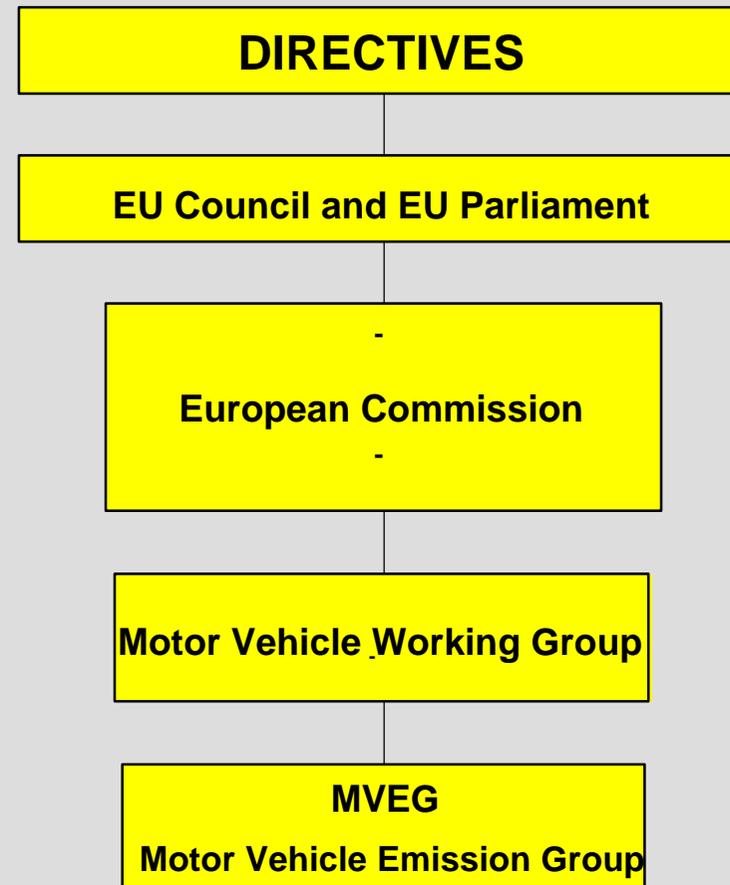


# Two Pathways to Present a Proposal for a Regulation

## UN-ECE



## EC



# EIHP2 - H<sub>2</sub> Regulations & Standards for Road Vehicles

## APPROVAL OF ROAD VEHICLES

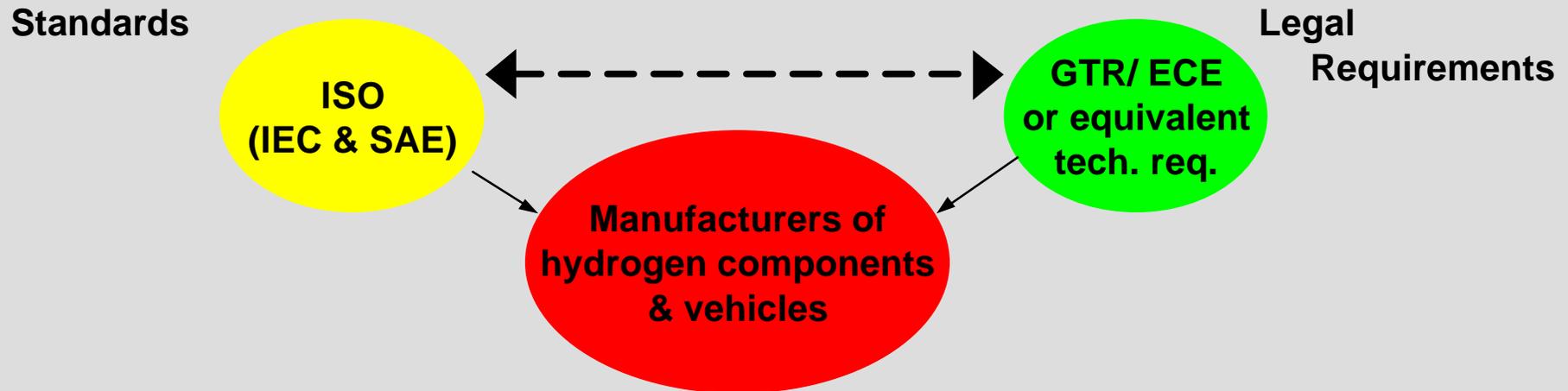
- Vehicle manufacturer's in both Europe and the USA must meet legal requirements before a vehicle can be approved and registered for use.
- Vehicle manufacturer's need uniform legal requirements throughout the world to speed development and reduce costs.

	<u>Approval procedures</u>	<u>Legal Requirements</u>	<u>Goal for Future Legal Requirements</u>
Europe:	Type approval	ECE regulations or EC directives or	Global Technical Regulation
USA:	Self-certification	FMVSS	



# EIHP2 - H<sub>2</sub> Regulations & Standards for Road Vehicles

## Desirable Future Scenario For Regulations & Standards

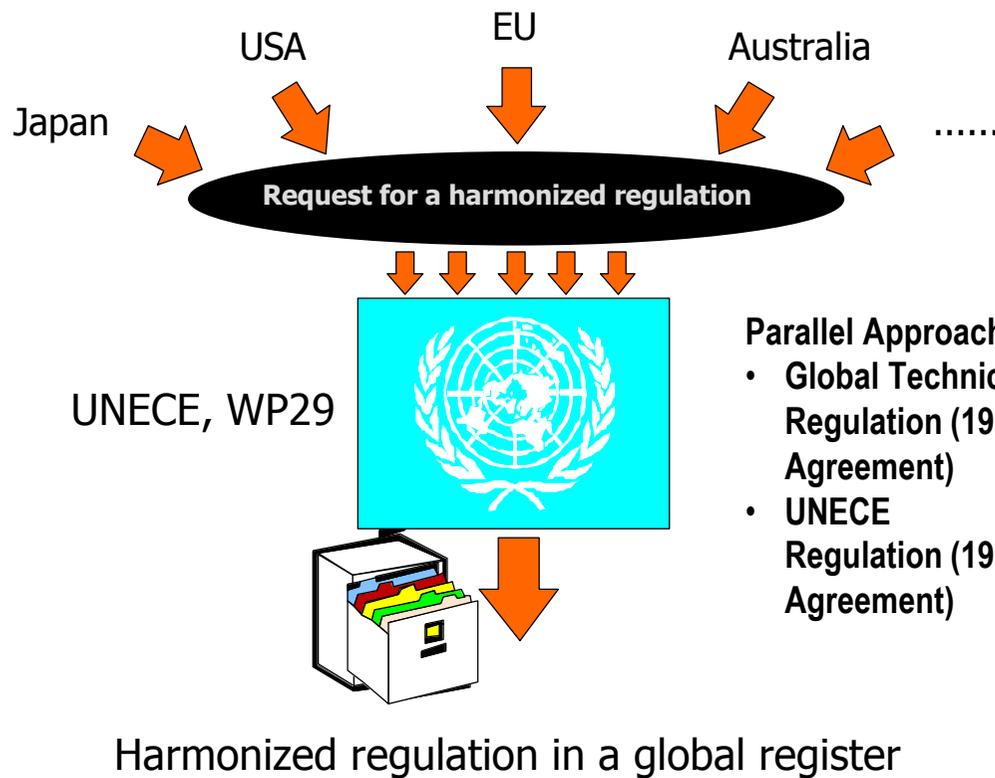


- Legal requirements should be created only where necessary
- No standards should be created for subjects where legal requirements are necessary
- Standards are necessary for communication between industries
- Standards are not required for the whole vehicle
  - What would be the benefit of such standards?
  - Why should such standards be created only for hydrogen vehicles?



# UNECE Platform for Globally Harmonized Regulation for H<sub>2</sub> Vehicles

## UNECE WP29 - Global Platform for Harmonisation of Legal Requirements for Road Vehicles



- In Europe, vehicles receive Whole Vehicle Type Approval on the basis of a regulation (legal requirement) and not on the basis of standards
- In the EU every member state has different regulations and standards concerning H<sub>2</sub> - need for EU-wide harmonization is necessary
- UNECE WP29 was identified by EIHP1 as platform for EU-wide harmonization with the possibility for later global harmonization of regulations as it is the recognized World Forum
- EIHP1 developed proposals for draft regulations for CGH<sub>2</sub> and LH<sub>2</sub> road vehicles
- UNECE suggested to develop Global Technical Regulation (GTR) as a priority and in parallel continue to develop UNECE draft regulations in order to bring vehicles on European roads in time

UNECE : Economic Commission for Europe, United Nations, Geneva



# EIHP2 - H<sub>2</sub> Regulations & Standards for Road Vehicles

## WHAT DO WE NEED TO ACHIEVE THIS GOAL?

- Vehicles:** Uniform technical requirements for hydrogen vehicles in all markets or preferably Global Technical Regulations (GTR)
- Refueling Interface:** One standardized refueling interface each and appropriate refueling procedures for LH<sub>2</sub> and CGH<sub>2</sub> at a global level, e.g. ISO standards. (uniform global requirements - ISO)
- Refueling Infrastructure:** Standardized requirements for LH<sub>2</sub> and CGH<sub>2</sub> refueling stations based on global standards and an industry code of practice (uniform global requirements - ISO)



## EHHP2 - UNECE Agreements 1958 and 1998

MEMBERS OF THE 1958 AGREEMENT: [(E/ECE/324-E/ECE/TRANS/505/Rev.2)]

GERMANY, FRANCE, ITALY, NETHERLANDS, SWEDEN, BELGIUM, HUNGARY, CZECH REPUBLIC, SPAIN, YUGOSLAVIA, UNITED KINGDOM, AUSTRIA, LUXEMBOURG, SWITZERLAND, NORWAY, FINLAND, DENMARK, ROMANIA, POLAND, PORTUGAL, RUSSIAN FEDERATION, GREECE, IRELAND, CROATIA, SLOVENIA, SLOVAKIA, BELARUS, ESTONIA, BOSNIA AND HERZEGOVINA, LATVIA, BULGARIA, TURKEY , THE FORMER YUGOSLAV REPUBLIC OF MACEDONIA, EUROPEAN COMMUNITY, JAPAN, AUSTRALIA, UKRAINE, REPUBLIC OF SOUTH AFRICA

MEMBERS OF THE 1998 AGREEMENT: [(E/ECE/TRANS/132 AND Corr.1)]

CANADA, UNITED STATES OF AMERICA, JAPAN, FRANCE, UNITED KINGDOM, EUROPEAN COMMUNITY, GERMANY, RUSSIAN FEDERATION, PEOPLE'S REPUBLIC OF CHINA, REPUBLIC OF KOREA, ITALY, REPUBLIC OF SOUTH AFRICA, SPAIN

