



EUROPEAN  
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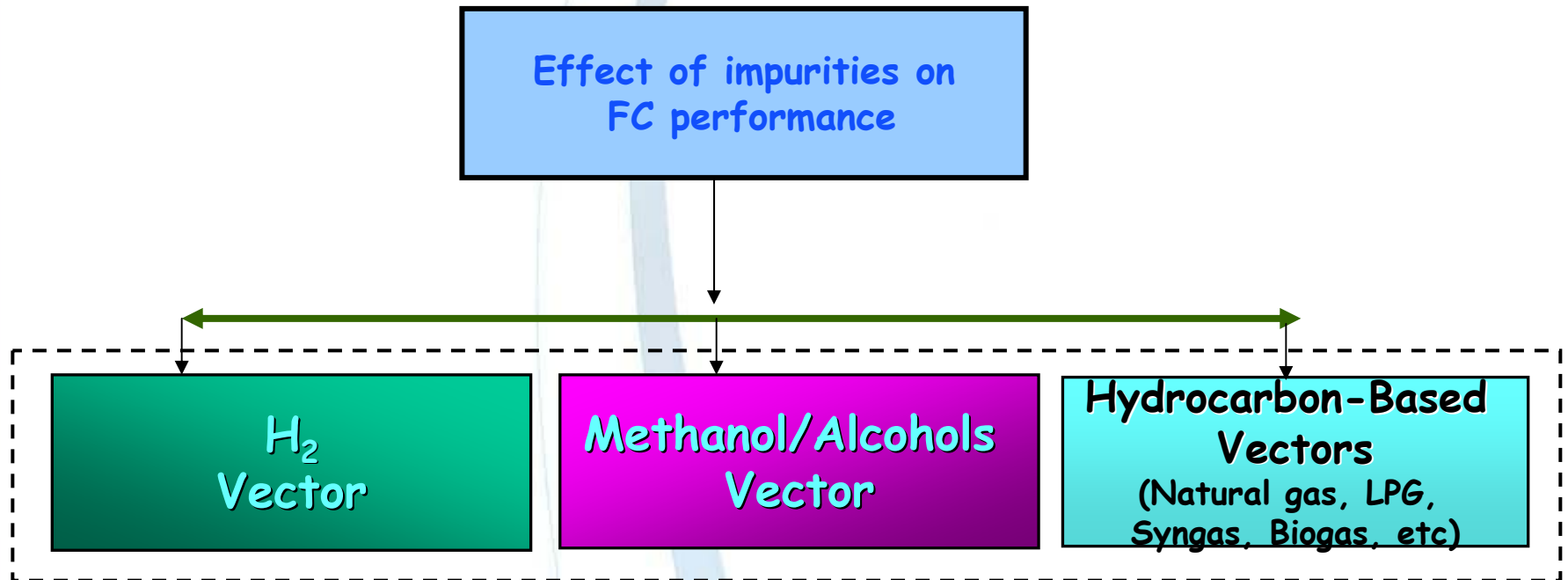
Community research

# HyQ – Hydrogen fuel and air Quality for fuel cells

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## Project Background

HyQ is part of a wider program for assessing fuel and air impurity issues in fuel cells



***Due to current priorities, HyQ will deal only with the H<sub>2</sub> vector!!***



## Project Objectives (1)

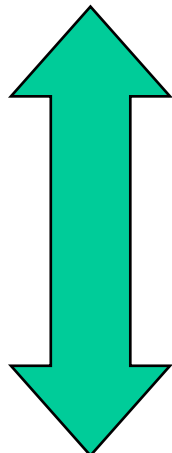
HyQ has the following main objectives:

- To establish **tolerance levels** of common **contaminants** in hydrogen fuel and air for **PEM** fuel cells
- To define **hydrogen and air quality** in support of, respectively, **ISO TC 22 and 197** and **IEC TC 105**
- To recommend fuel and air quality measurement methodology to **ISO TC 197** and liaise with **SDO**
  - Sampling methodology
  - lab methods and field methods
- To recommend measures to **UNECE GRPE**

Envisaged topic of submission: **ENERGY.2007.1.3.1: Pre-normative research to support EU and international regulatory activities**

## Why is H<sub>2</sub> quality a priority?

Increase in  
fuel costs



High grade H<sub>2</sub> fuel

Low grade H<sub>2</sub> fuel

FC Performance  
decline

Fuel Cost is a major issue

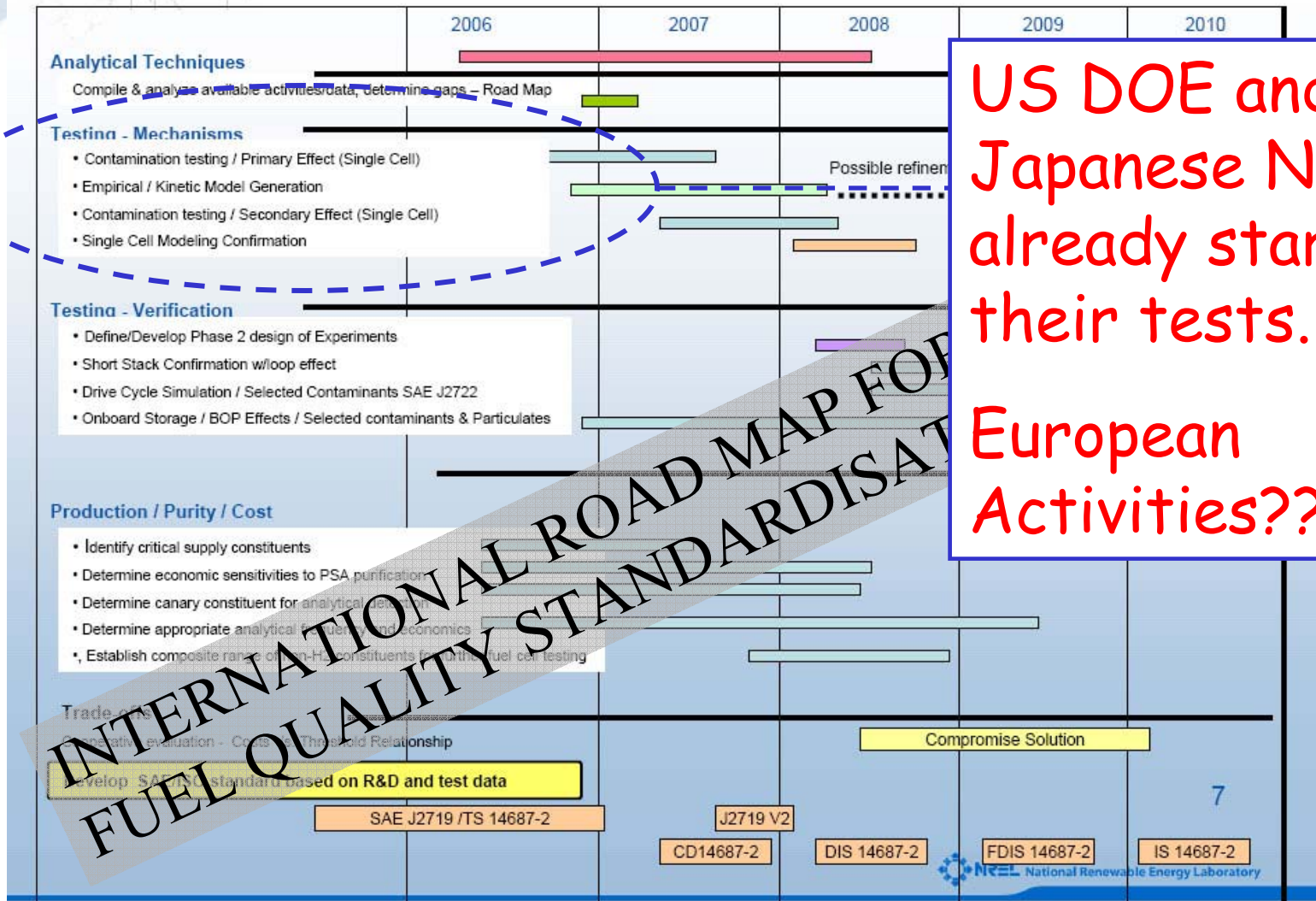
IMPACT OF H<sub>2</sub> QUALITY ON PEFC  
PERFORMANCE IS NOT YET  
COMPLETELY ASSESSED

**NEED FOR PRE-NORMATIVE RESEARCH  
TO SUPPORT INTERNATIONAL HYDROGEN FUEL  
STANDARDISATION & REGULATIONS!!**



# INTERNATIONAL EFFORT

## Draft Timeline for Hydrogen Quality Standard



US DOE and Japanese NEDO already started their tests.

European Activities??

INTERNATIONAL ROAD MAP FOR FUEL QUALITY STANDARDISATION

(from J. Ohi, FCTES<sup>QA</sup> Meeting, Honolulu, Hawaii, November 13, 2006)



## PROJECT APPROACH

- Conduct testing in supporting the preparation of international standards, namely ISO TC 197
  - Evaluate already existing results on critical contaminants
  - Exploit already existing synergies with US, Japanese and other IPHE member states organizations (FCTES<sup>QA</sup> and FCTEDI consortia)
  
- Assess hydrogen purification methods with respect to cost and effects
- Identify critical analytical methods and procedures needed to verify recommended maximum level of contaminants

# PROJECT STRUCTURE

## Project management

### Activity 1: Fuel impurity tolerances

- o Establish fuel tolerance levels on acceptable fuel cell performance by test campaigns

### Activity 2: Air quality

- o Establish air tolerance levels on acceptable fuel cell performance by test campaigns

### Activity 3: Hydrogen supply information

- o Gathering information on feedstock and H<sub>2</sub>, according to type and geographical location
- o Assess H<sub>2</sub> purification methods
- o Cost benefit analysis on hydrogen fuel purification etc

### Activity 4: Gas analysis methods

- o Identify suitable analysis techniques & measurement methodologies
- o Laboratory methodology
- o Field test methodology

### Activity 5: RC&S liaison

- Delivery of tolerance levels for typical H<sub>2</sub> impurities (contaminants & diluents) to ISO TC 197
- o Recommendation to ISO TC 197 WG 12 on suitable hydrogen fuel analysis techniques and measurement methodology
- o Dissemination of test results to CEN TC, IEA IA AFC, IPHE & HFP and interested parties

### Activity 6: Components and BoP



# POTENTIAL PROJECT PARTNERS

R&D organizations

End users

Hydrogen suppliers

Equipment manufacturers (filters, gas purifiers, gas handling equipment)

Gas associations

International SDO (ISO, CEN, IEC)



## Links with other FP6

- HyQ will act in synergy with and will be supported by the STREP FP6 Fuel Cell Testing & Quality Assurance (FCTES<sup>QA</sup>)
- Other relevant projects will be identified and an appropriate link will be established at a later stage



## EXPECTED IMPACT

- Delivery of experimentally validated impurity tolerance levels in H<sub>2</sub> fuel & Air for PEFC to ISO TC197 / IEC TC 105
- Support to EU fuel cell Industry competitiveness by an extensive wealth of test data
- Supply of gas impurity measurement methodology to SDOs