TIMELINE OF ACTIVITIES NECESSARY FOR THE DEVELOPEMNT OF A HYDROGEN PURITY SPECIFICATION GUIDELINE FOR FUEL CELL VEHICLES

SOCIETY OF AUTOMOTIVE ENGINEERS
(*SAE International*)
Hydrogen Specification Task Force

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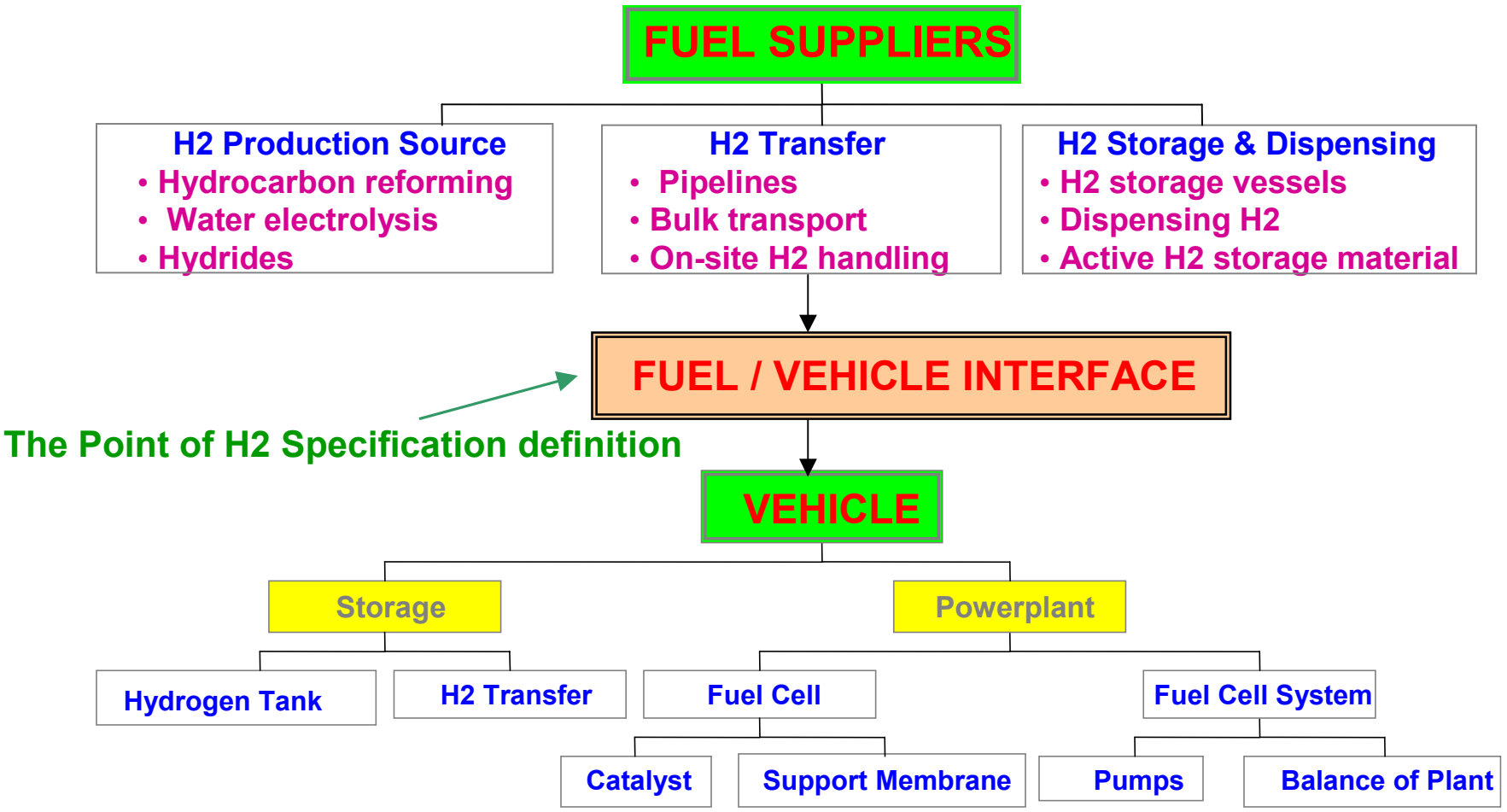
Overview of Roles and Responsibilities for SAE's HSTF

- Develop an evolving H2 fuel purity guideline for the vehicular refueling interface, which will mature as technology advances toward commercial feasibility, Figure 1.

- It is anticipated that by 2010, the latest guideline would form the basis of a proposed standard for commercial hydrogen fuel purity for H2 powered vehicles, possibly including ICEs.

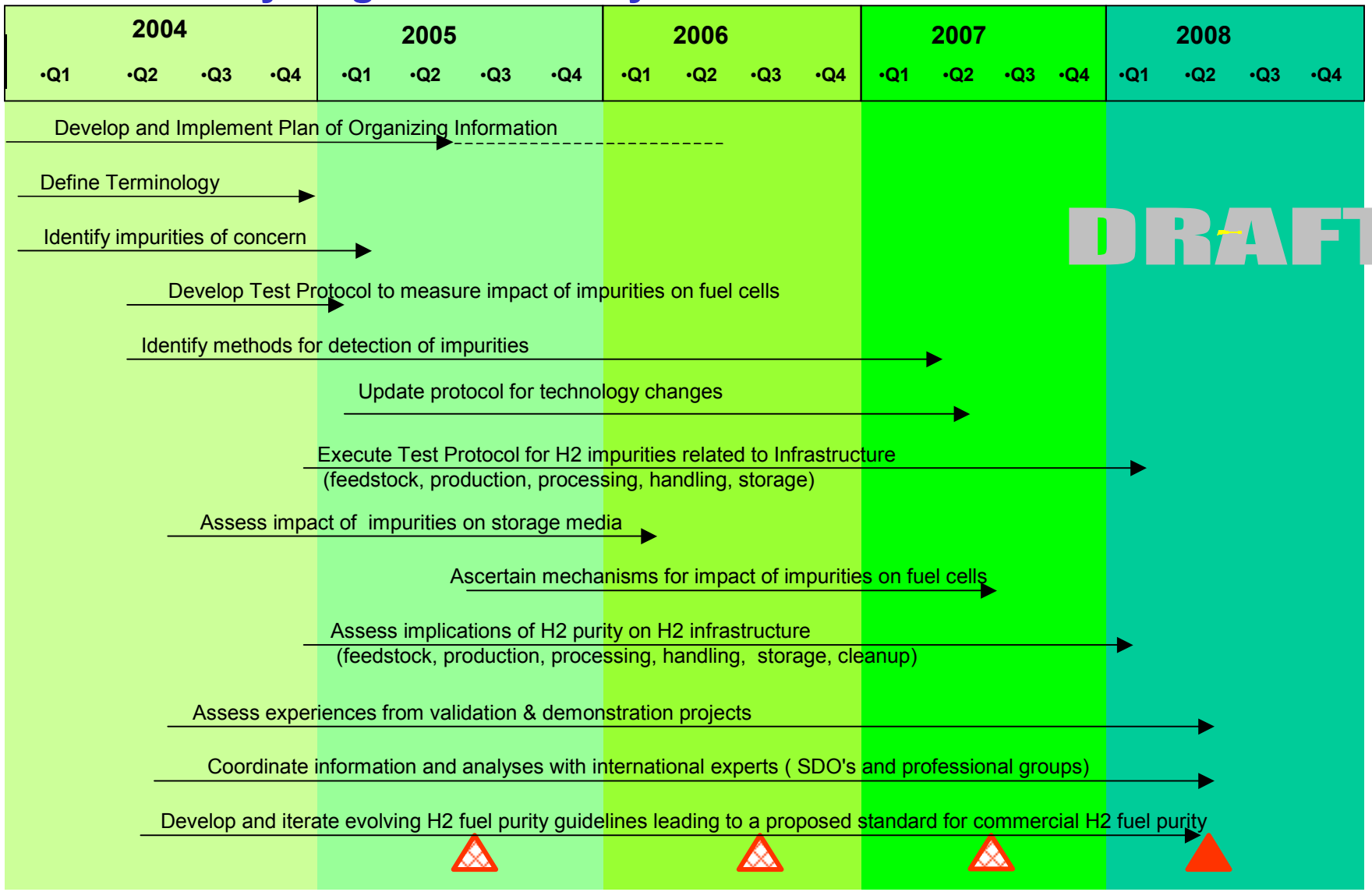
Figure 1: Fuel-Vehicle Interface Consideration for the Development of H2 Purity



Overview of Roles and Responsibilities for SAE's HSTF (continued)

- Develop and implement a plan for organizing the information needed to develop a H2 specification guideline, Table 1.
- Advise collaborating organizations on information required to enable the HSTF to develop a guideline, leading to a proposed standard, Figure 2.

TIMELINE of Activities to Develop a Hydrogen Fuel Purity Standard for Vehicles



Draft SAE Technical Reports towards the development of a H2 Purity Specification

Drafted an SAE Recommended Practice for purity of Hydrogen Fuel

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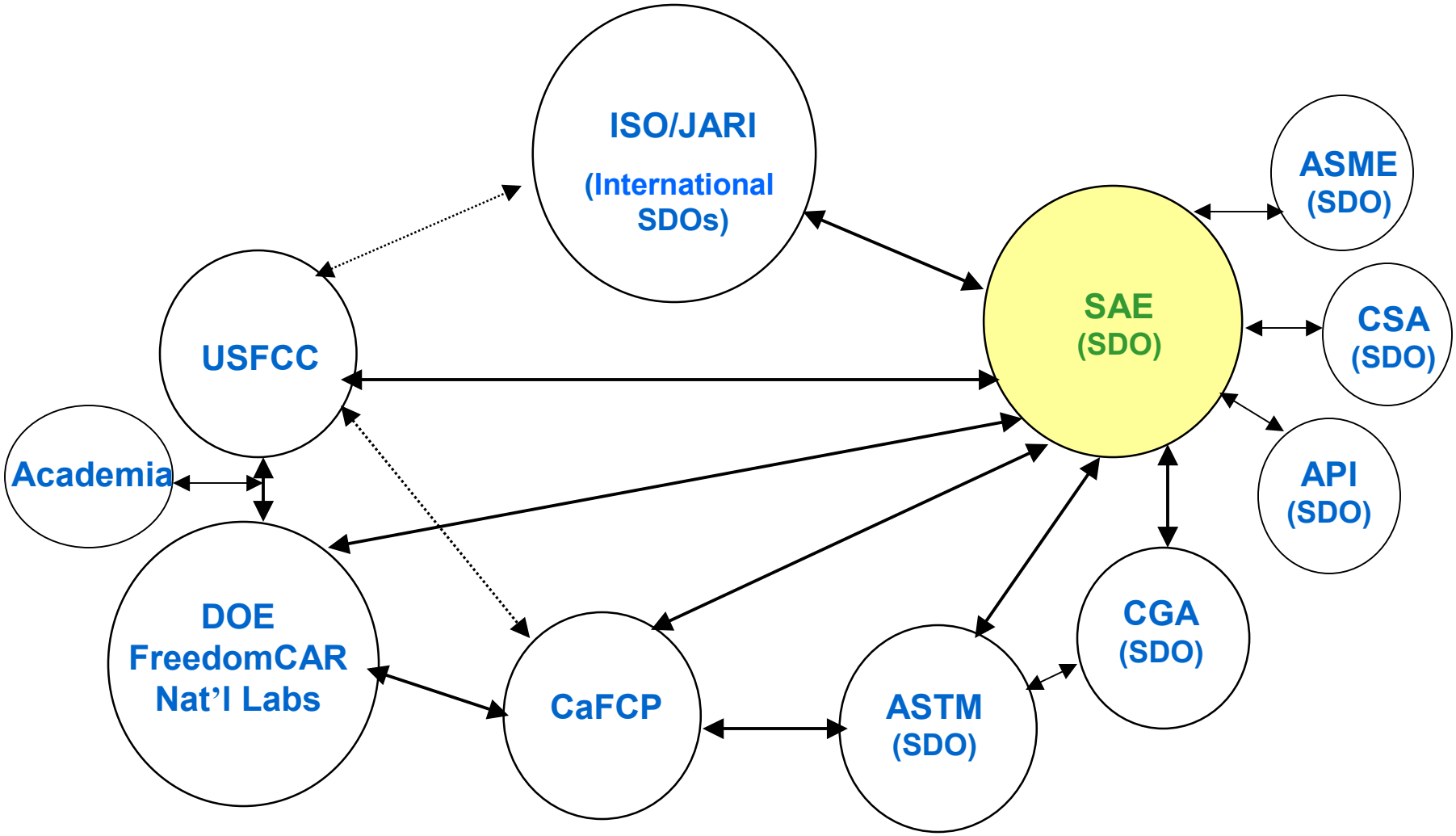
Figure 2: Organizational Interactions for the Development of a H2 Purity Guideline (SAE J-doc)



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Overview of Roles and Responsibilities for SAE's HSTF (continued)

- Elicit input from the fuel cell system, onboard storage and fuel provider communities on allowable impurity thresholds, considering production, distribution, storage and handling of H2 from various sources
- Elicit input on applicable standard test methods that will detect the identified H2 impurities
- Derive common definitions for terms such as inerts, diluents, contaminants, etc.
- Be cognizant of vehicle integration issues that may affect, or be affected by, H2 purity

Status of the SAE H_2 Specification Task Force (HSTF)

- Developed a Mission Statement
- Provided advice to DOE on the factual information needed to support the development of a hydrogen purity guideline leading to a proposed commercial standard.
- Discussing activities related to H2 Purity with:
  - JARI
  - ISO/TC197
  - USFCC
  - FreedomCAR & Fuel Partnership
  - DOE & National Labs
  - CaFCP
  - Universities
  - ASTM
  - CSA
  - CGA
- Established Task Forces within HSTF to assemble publicly available data on H2 impurities that have been generated by energy providers, fuel cell manufacturers and FCV OEMs.

BACK-UP SLIDES

Proposed Mission Statement

The mission of the H2 Specification Task Force (HSTF) is to develop an evolving H2 fuel purity guideline for the vehicular refueling interface, which will mature as technology advances toward commercial feasibility. It is anticipated that by 2010, the latest guideline will form the basis of a proposed standard for commercial hydrogen fuel purity for H2 powered vehicles (possibly including ICEs). The evolving guideline will reflect advancing knowledge and will be based on:

- Input from the fuel cell system; onboard storage and fuel provider communities on allowable impurities and their thresholds
- Applicable standard test methods that will detect the identified H2 impurities
- Issues related to production, distribution, storage and handling of H2

The HSTF will advise collaborating organizations on information required to enable the HSTF to develop a guideline, leading to a proposed standard. The guideline will include the acceptable threshold values of the impurities present in the H2 fuel intended for automotive applications relating to:

- Fuel cell systems
- On-board H2 storage and delivery systems

The compiled threshold values will be based on the consideration of alternative H2 production pathways, H2 purification methods, and fuel cell performance & durability.

Information Required by SAE for Development of H2 Purity Guidelines for Fuel Cell Vehicles

- Definition of terminology
- Impurities of concern
- Testing Protocols for Studying Adverse Levels of Impurities
  - Chemical analysis and detection of Impurities
  - Procedures for impact measurement & reporting
- Adverse Effects Caused by Impurities (mechanisms)
- Implications of hydrogen purity for complexity, performance and durability of fuel cell systems and hydrogen infrastructure
- Inputs from other SDOs (national & international) and professional review panels
- Experiences (Lessons Learned) from Validation & Demonstration Projects