

ELEDRIVE WORKSHOP

Experience related to C&S, Safety and Education

The View of Norsk Hydro





Content

- **Background**
- **Approval procedure as today**
- **Development of C&S**
- **Recommendations**



Background

- **The views and recommendations is based on Norsk Hydro's experience from working in the following projects:**
 - **EIHP 2**
 - WP 2 (leading) Refuelling Stations
 - WP 3 Interface
 - WP 5 Safety
 - **CUTE (Leading safety and quality methodology working group)**
 - **Hynet TWG 3 (leading) – Regulatory Issues**
 - **ISO TC 197**
 - WG 8,9 and 10
 - **ECTOS**
- **Note: The presentation is the view of Norsk Hydro, not the joint view from any of the above projects**

The Approval Process – Experience from CUTE and ECTOS





The “Approval Process”

- **The “Approval Process” is the process of obtaining mandatory permissions and approvals from local and/or regional authorities**
- **The approval process applies to:**
 - **Establishment of facilities: Location and infrastructure, equipment and assemblies of equipment**
 - **Operation and maintenance of the facilities**
- **Notified/Competent Bodies may be authorized by the authorities to assist in the process**



The approval process

- **Normally the approval process takes several months and includes the following steps:**
 - **Application for authorization**
 - **Response from the authorities: A permission document with detailed description of all requirements**
 - **Public hearing of the permission document**
 - **Permission to build / establish the facilities**
 - **Inspections of the established facilities, by Public Authorities / Notified Body**
 - **Approval of the facilities and permission to operate**



Licences and certificates

- **Licences, permits, and certificates :**
 - **Building licence**
 - **Environmental licence**
 - **Operational licence**

- **Certificated needed to obtain the licences:**
 - **CE certificates (which includes detailed documentation of the equipment)**
 - **Third party inspection document / certificate**



Authorities involved

- **Authorities involved in the approval process are normally:**
 - **Environment Authorities**
 - **Fire and Explosion Authorities**
 - **Municipal Building Authorities**
 - **Civil Work Authorities**



Experience from the CUTE city projects (I)

- **The city project groups did know which authorities or Competent / Notified Bodies to address**

BUT

- **The approval process was not known to all cities before they started the process of establishing the facilities**
- **Neither did all city project groups know what kind of technical and safety related information that was required to obtain the permissions and certificates needed**



Experience from the CUTE city projects (II)

- **The steps and the time schedule of the approval process were not known to all cities from start of the project**
- **The authorities have guided the city project groups in how to apply and how to approach the approval process**

BUT

- **Interpretation of mandatory regulations has not been straight forward**



Experience from the CUTE city projects (III)

- **In most cases the authorities and the city project groups have developed a mutual understanding of how to interpret and comply with the regulations**
- **Limited knowledge about the technical and safety related information required, has made the approval process a time consuming activity for the city project groups**



Authority approval of hydrogen applications – requirements

- **Important aspects regarding authority approval**
 - **Relevant national regulations**
 - **Risk analysis**
 - knowledge about hydrogen safety related properties not yet fully explored
 - relevant operation and accident statistics missing or insufficient
 - **CE marking**
 - dependent on risk analysis, testing and operation experience



Authority approval of hydrogen applications – requirements

Shortage:

- Expertise and knowledge related to hydrogen properties, hydrogen safety and the technical solutions, within competent notified bodies organisations responsible for CE marking, and public authorities are limited.
- These gaps and needs lead to a slow and inefficient approval process



Hydrogen Education/ Communication

- **Target groups**
 - **Public authorities (very important since successful acceptance and introduction of hydrogen systems is dependent of public authorities)**
 - **Operators of hydrogen refuelling stations**
 - **Third party using or "exposed to" hydrogen applications**
 - **Environmental organizations (NGOs)**
- **Means of education/communication**
 - **Seminars for public authorities and hydrogen facilities operators**
 - **Lectures at seminars, conferences**
 - **Input to education books**
 - **Lectures at universities**
 - **Leaflets, folders**
 - **Press releases**

Development of Codes and Standards





Standards

- Not legal requirements
- Made by interested parties
- Supposed to give recommendations about safe solutions and practice on the particular topic/ installation/equipment
- Supposed to support the free exchange of goods and services
- Examples:
 - ISO, IEC
 - NFPA
 - IGC
 - ASME
 - ANSI

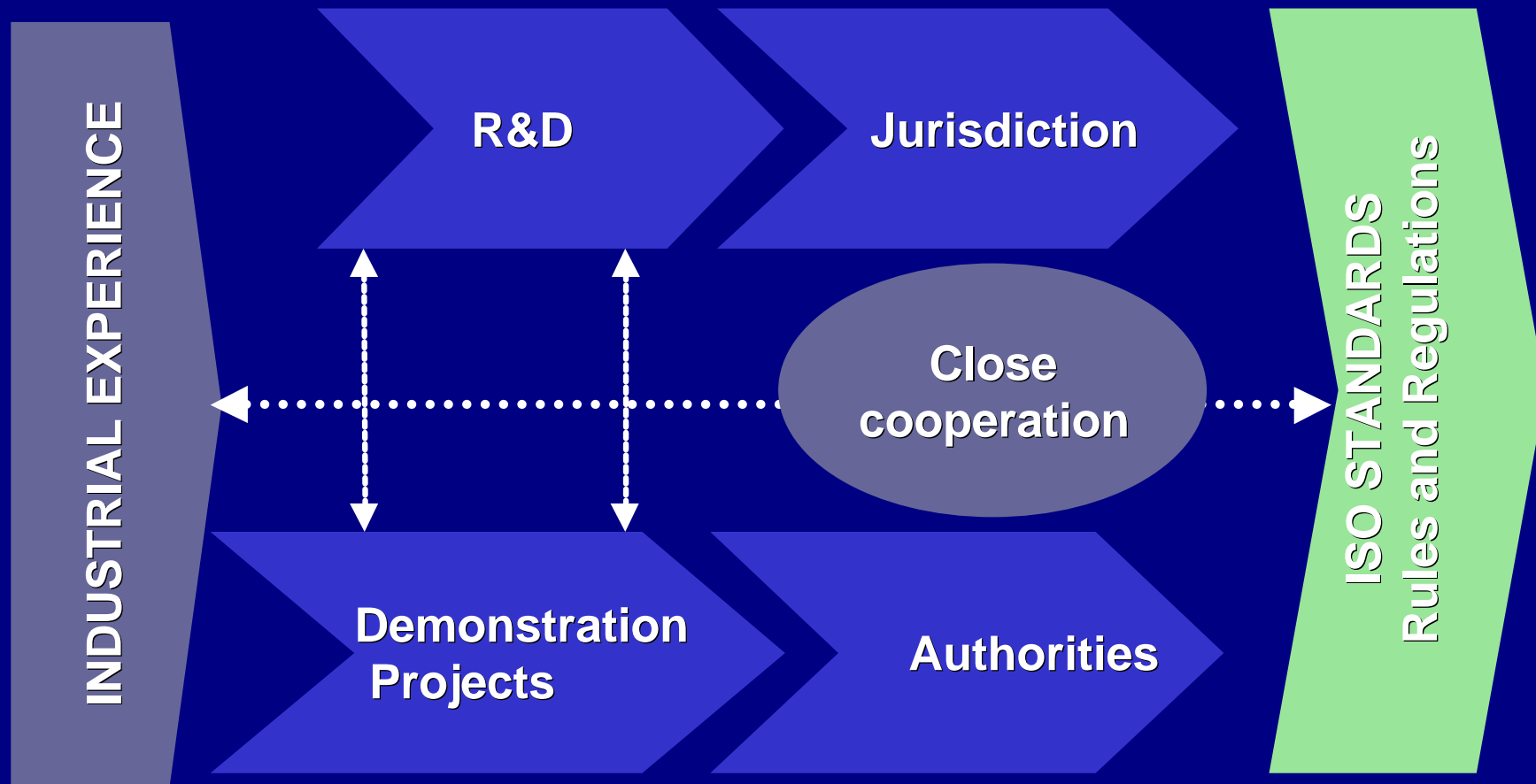


EU directives and international regulations

- **Legal Requirements and Regulations is ranked above standards**
- **EU directives express the frame requirements for national regulations in the different European member countries**
- **Important directives regarding hydrogen technologies and infrastructure are:**
 - **ATEX directives**
 - **PED (Pressurised Equipment Directive)**
 - **EMC (electromagnetic compatibility) directive**
 - **The Machinery Safety Directive**
 - **SEVESO II (large amounts of haz. mat.)**
 - **Transport of dangerous goods by road**
 - **UN IMO**



Approach for development of ISO Standards for hydrogen





Development of Standards and Regulations

- **Other parts of the world have other rules and regulations. This could make a problem harmonizing all kinds of standards for all relevant areas.**
- **ISO and IEC with their technical committees should try to cover all common interests.**
- **Development of standards and regulation require knowledge about how to do it. Experts know!**
- **To have influence means participation in the development of drafts, membership in relevant committees, membership in working groups, convenership and so on.**



Standardization work

ISO/TC 197, which covers 'Hydrogen Technologies', and some other of its 14 liaison committees are central to the development of infrastructure.

- **P-members in ISO/TC 197: 17 countries**
- **O-members: 12 countries.**
- **Only half of the P-members are actively participating in the development of standards**



Standardisation Work – Example of lack of commitment

- **New working item : Gaseous Hydrogen Service Station**
- **6 (5 active members a minimum) have volunteered to contribute to the development of the standard:**
 - **Canada (leader)**
 - **Norway**
 - **Holland**
 - **France**
 - **Japan**
 - **Argentina (???)**
- **US voted against**
 - **Hazardous zones are critical**
 - **US have started large activity to address this issue**
 - **US wants fixed zones**
 - **This will require fixed technology solutions**
 - **European approach is evaluation by risk assessment**

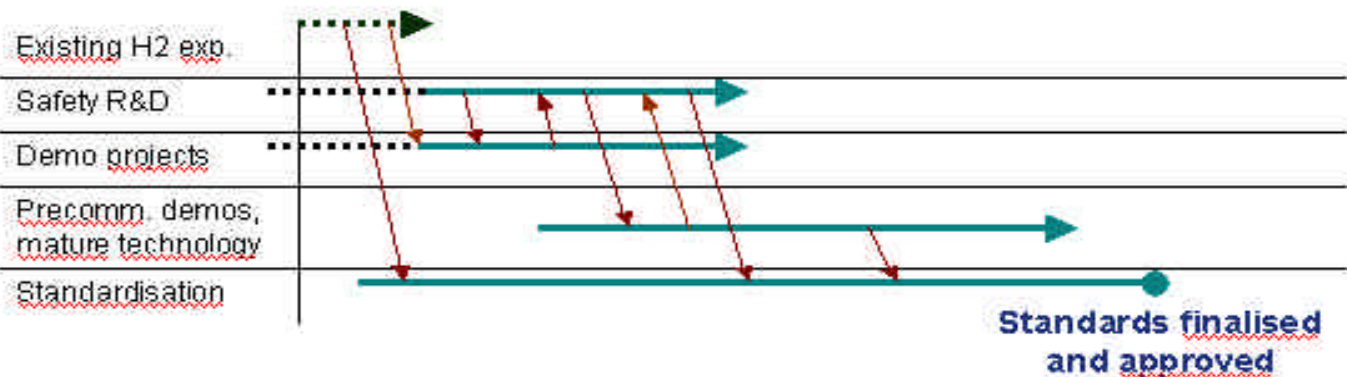
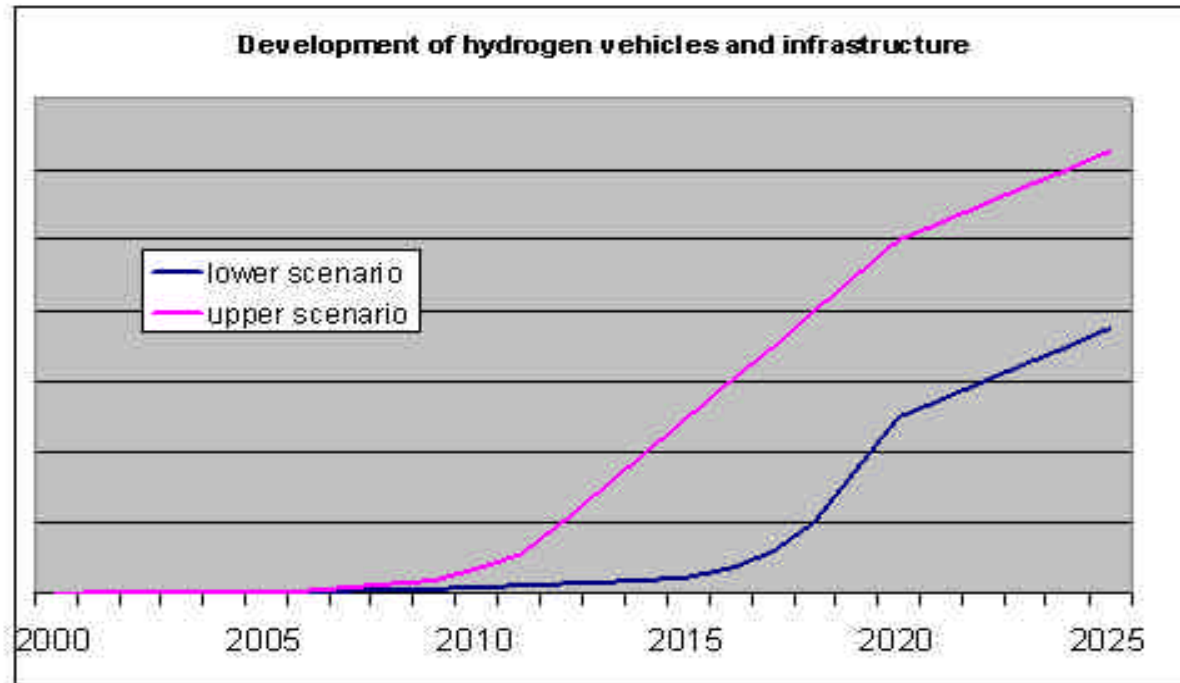


Key Conclusions

- **We need commitment !!!!!**
- **Education of public authorities and organisations responsible for approval, eg. CE-marking**
- **Risk Analysis is a key area**
 - **Common understanding**
 - **Safety work is needed to support this area**
 - **Experimental and modelling - HYSAFE**
 - **Statistical data etc.**
- **We need harmonisation of standards and legal requirements**



Hynet - Roadmap





EU and EU/US Collaboration

- **There must be a win-win situation in all types of collaborations**
 - **North America has the cash, EU has the skill and competence. Are we willing to trade the know-how ?**
 - **Why should company share knowledge if this does not give a return – do we need a reward system ?**
- **IPR and secrecy is a key barrier**
- **Who should form the core of that work**
 - **Do we need one place (comitee) in EU for this area ?**