The DOE Hydrogen Safety Program

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Safety is Paramount

- Prevent any and all accidents involving hydrogen to the greatest extent possible, including
  - During research, development and demonstration phase of hydrogen and fuel cell technologies supported with DOE funding
  - Over the long term, after these technologies have been placed in consumers' hands
- Public perception of hydrogen safety is critical to
  - Prevent overly restrictive requirements (want a level playing field among fuels)
  - Maintain insurability

Safety Program Addressing New Needs

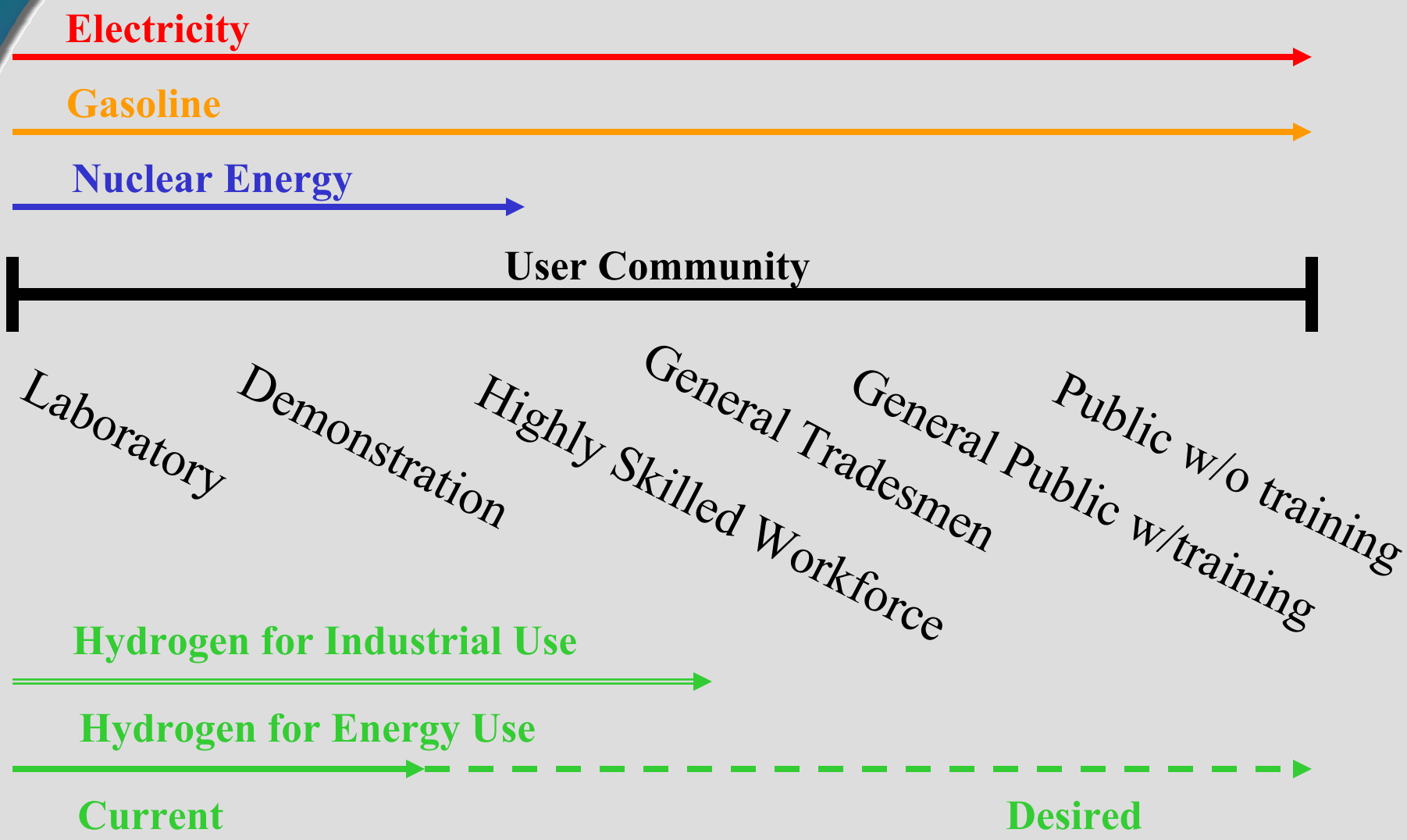
Hydrogen has been used with a high degree of safety in industrial and aerospace applications for decades; *but*

Photo Credit: Linde AG

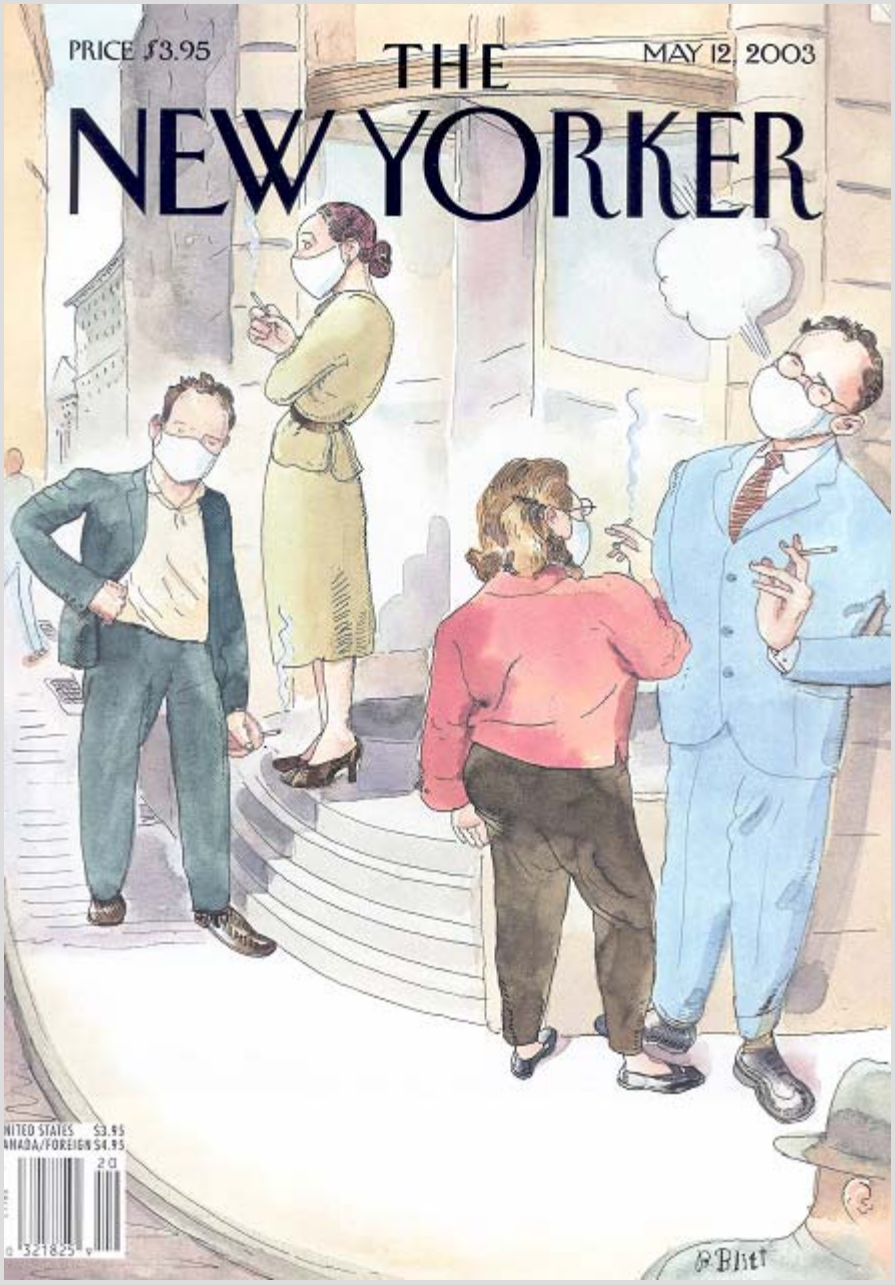
- use of hydrogen and related equipment is tightly controlled in these applications and is conducted by trained personnel with high levels of expertise

- costs are embedded in the final product; hydrogen is no more than a specialty chemical in industry

Safety Needs Driven by Intended Users



Risk of the New Always Greater than the Old



Hydrogen Safety Program Goals and Objectives

Goal: Ensure safety in the operation, handling, and use of hydrogen systems for all Department of Energy funded projects.

Objectives:

By 2004, the draft of a comprehensive safety plan will be completed in collaboration with industry.

By 2005, safety procedures will be integrated into all procurements for Department of Energy funding of projects.

By 2010, a Handbook of Best Management Practices for safety will be published.

Safety Program Approach

- Verification of the physical and chemical properties of hydrogen and its classification
  - Information published in many handbooks or training programs may be limited or inaccurate
- Safety reviews of current and future projects, including practices and procedures
- Development and publication of a comprehensive database on safety, including component reliability, sensors, and hydrogen releases
  - Current scientific and technical knowledge may be limited due to established training practices that must be followed for reasons of insurance liability, or because it is considered competition sensitive or proprietary
- Modeling and testing of various leak/accident scenarios

Hydrogen Safety Panel

- By 2004, form panel of experts to provide guidance on hydrogen safety to DOE projects.
- Panel to consist of industrial staff, government agencies and representative PIs from the National Laboratories, universities and industry.
- Panel will review a prioritized set of DOE projects annually, focusing on safety concerns. It will also review new projects at inception, paying particular attention to standard operating procedures.

Modeling and Testing - Examples

- Tank Integrity/Leak Test
- Separation Distances
- Underground Bulk Storage System Design
- Deflagration/Detonation

Hydrogen Safety Communications

- Resource Information/Website for Code Officials
  - Fuel Cell Resource Manual
  - Permitting Guide for Refueling Stations
- Fuel Cell Summit newsletter
- Training Materials for Fire Code Safety Officials
- Input on Hydrogen Safety to Road Shows

Hydrogen Safety Program Contacts

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