



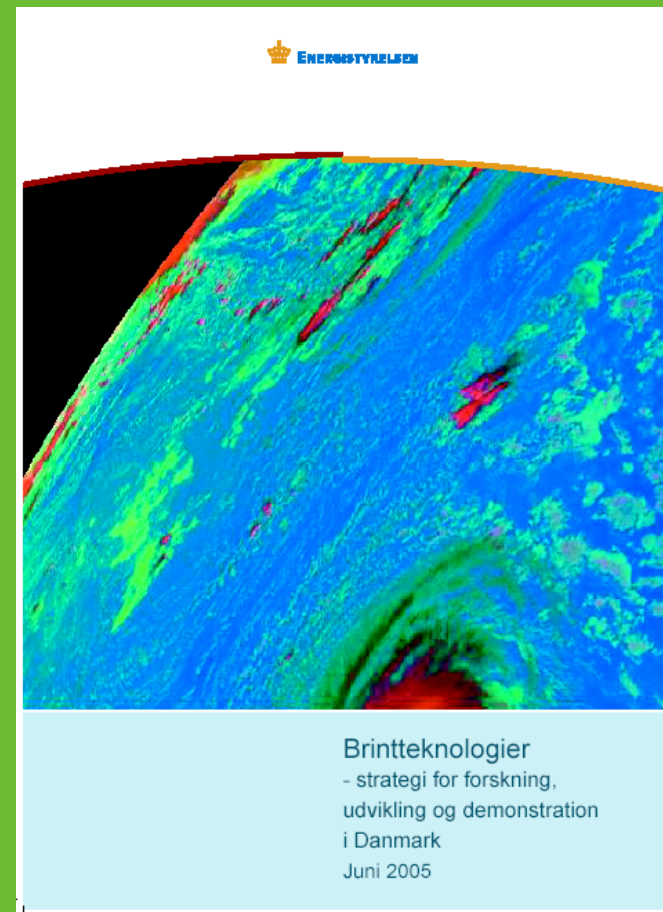
Danish Partnership for Hydrogen and Fuel Cells

**2nd Stakeholders general Assembly
October 2009, Brussels**

**Director - Aksel Mortensgaard
Danish Partnership for
Hydrogen and Fuel Cells**

Hydrogen Technologies

Strategy for Research, Development and Demonstration in Denmark, June 2005



Danish Focus Areas

Production



Reformers



Electrolysis



Hydrogen - Biomass

Storage



Metal Hydrides, Amines, Nanomaterials

Application



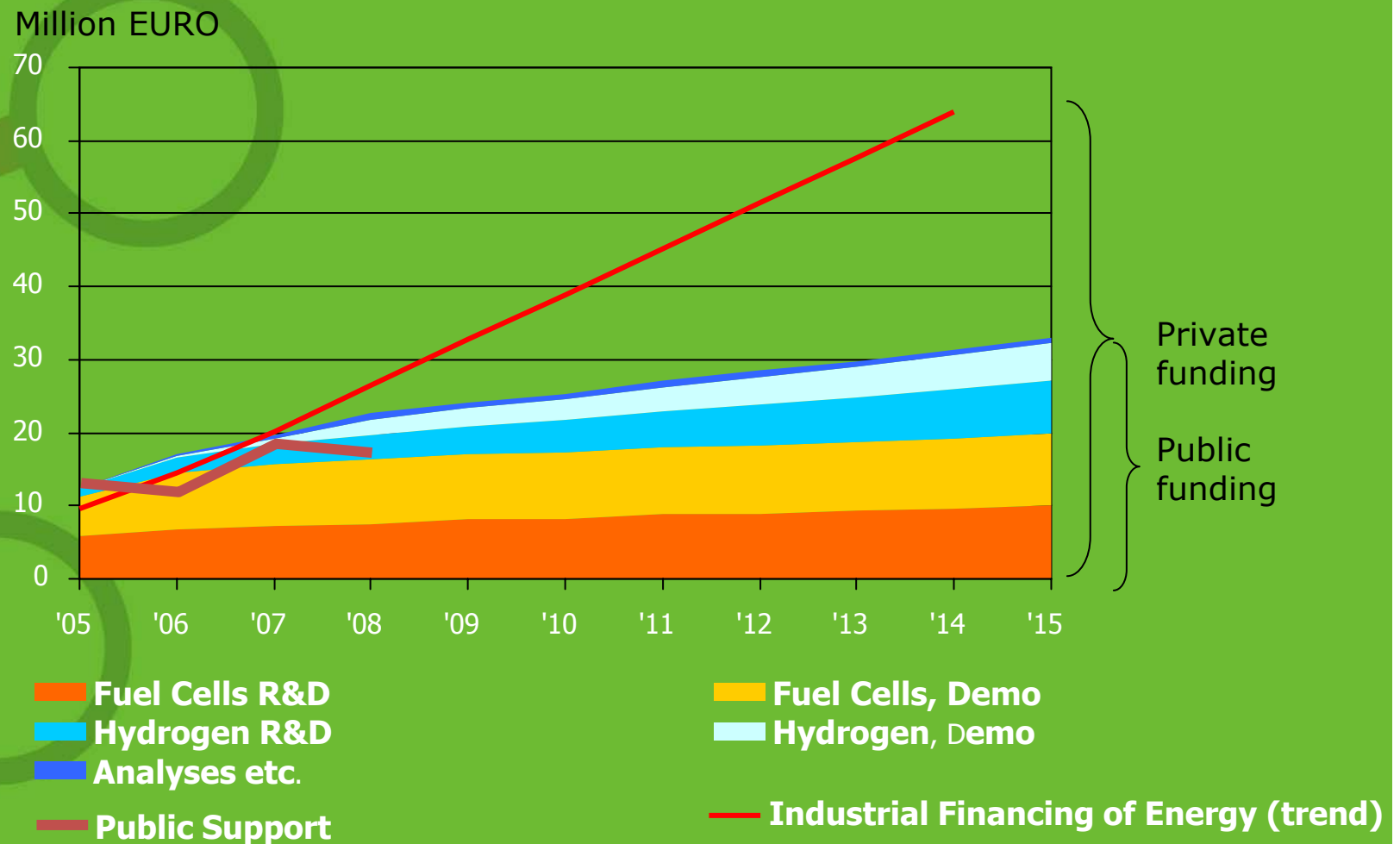
Fuel Cells & System Integration

Systems Analysis



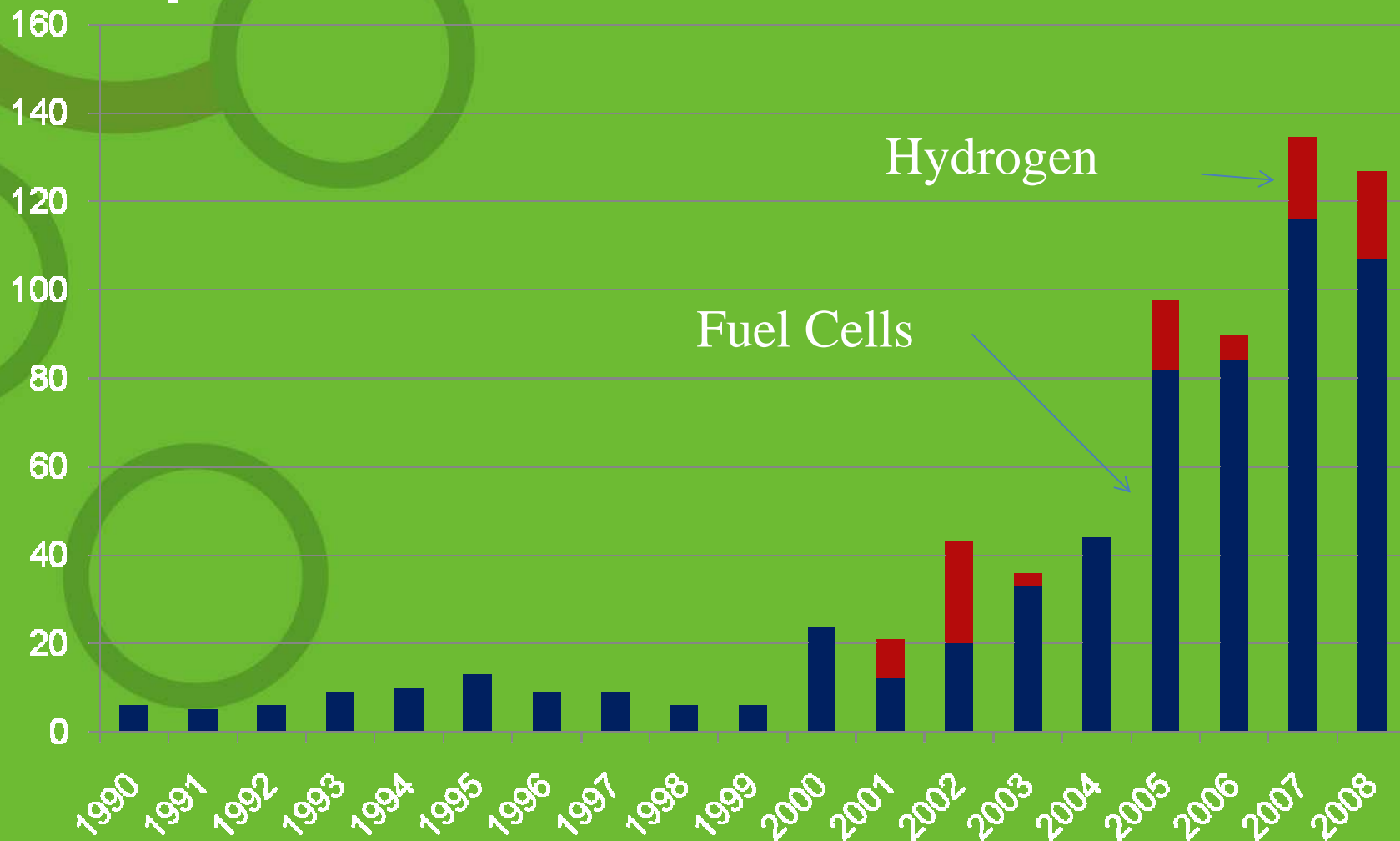
Socio - Economics, Safety, Standards

Challenges and the Costs Involved in Technological Development



Public Support to Hydrogen and Fuel Cells

Mio. DKK/year



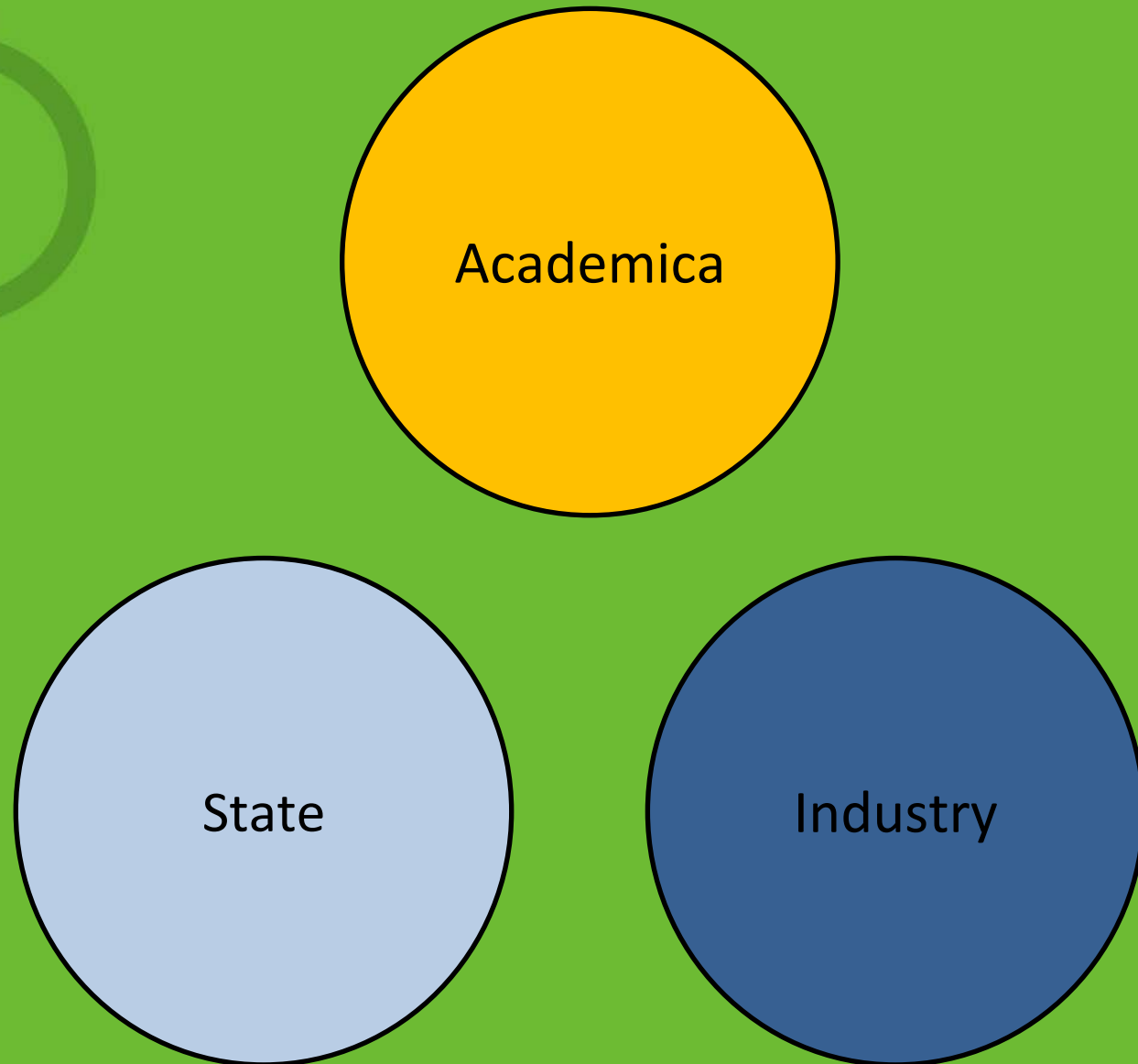
Source: Danish Energy Authority

SOFC Manufacturing Facility in Denmark

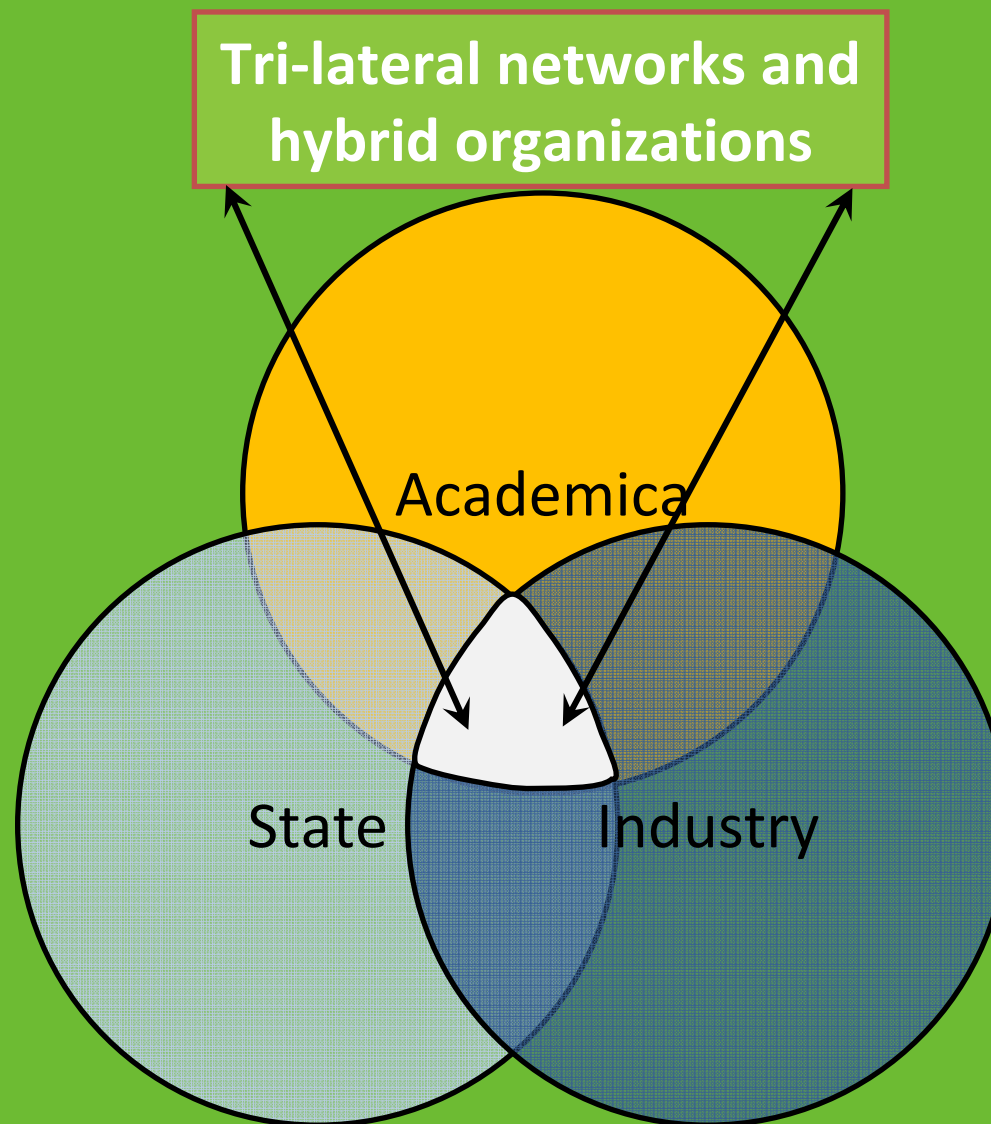


- Owner: Topsoe Fuel Cell A/S
 - Area: 5000m²
 - Capacity: 5 MW annually
 - Start up: Q4, 2008
- Investment: >13 mill EUR- 4.7 mill EUR from EU Life Environment

The Triple Helix Model of University – Industry - Government relations



The Triple Helix Model



Requirements for a Partnership

OPENNESS

TRUST

Top-down
Bottom-up

Added
Value

Facilitator

RESPECT

Danish Hydrogen & Fuel Cell Partnership

Fuel Cell
Materials

Fuel Cell &
Stacks

System
Components

Fuel Cell
Applications

End
Users

Research institutions



Industriv

TOPSOE FUEL CELL



Danish Power Systems



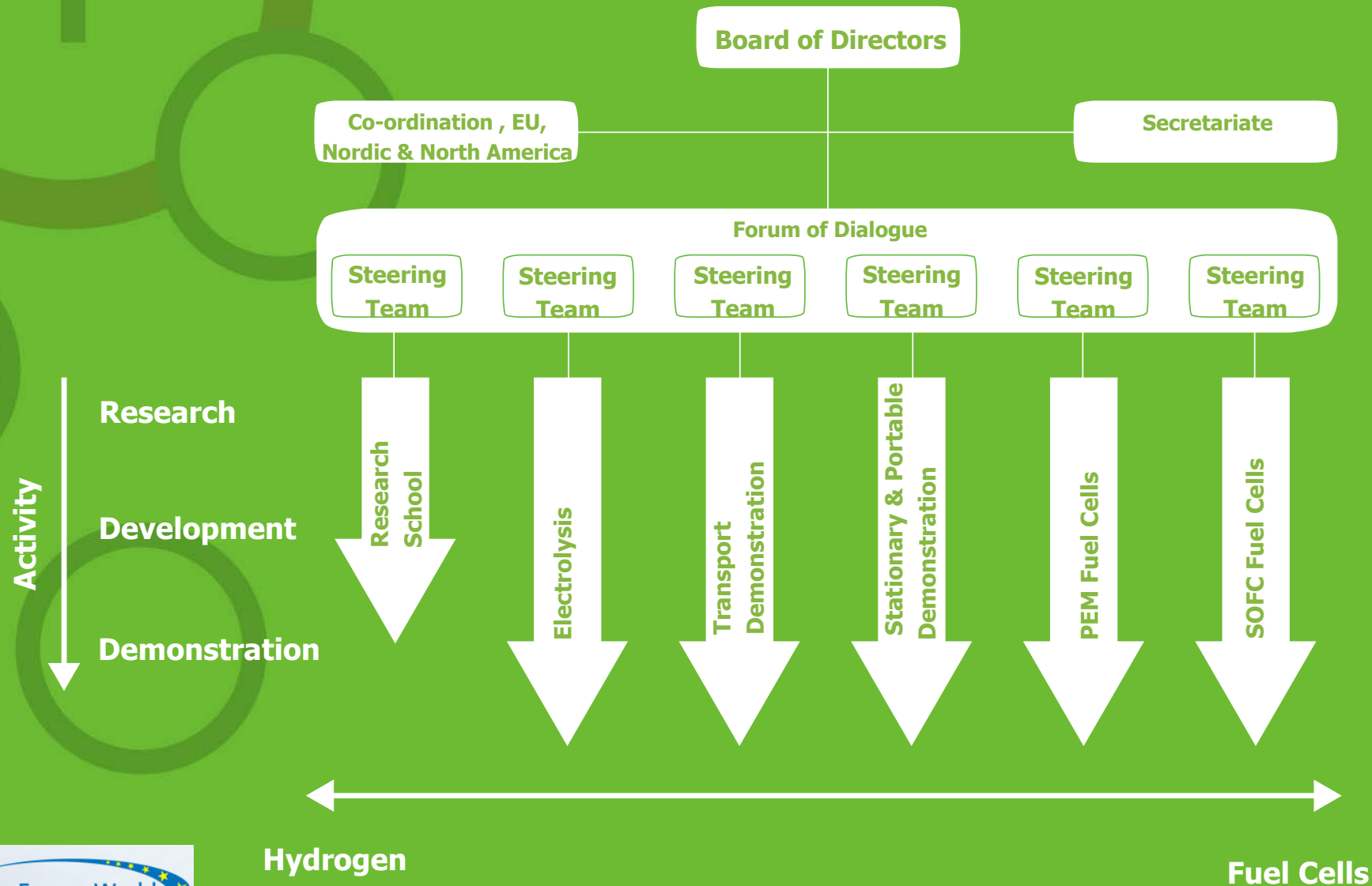
Institutions



Public Authorities

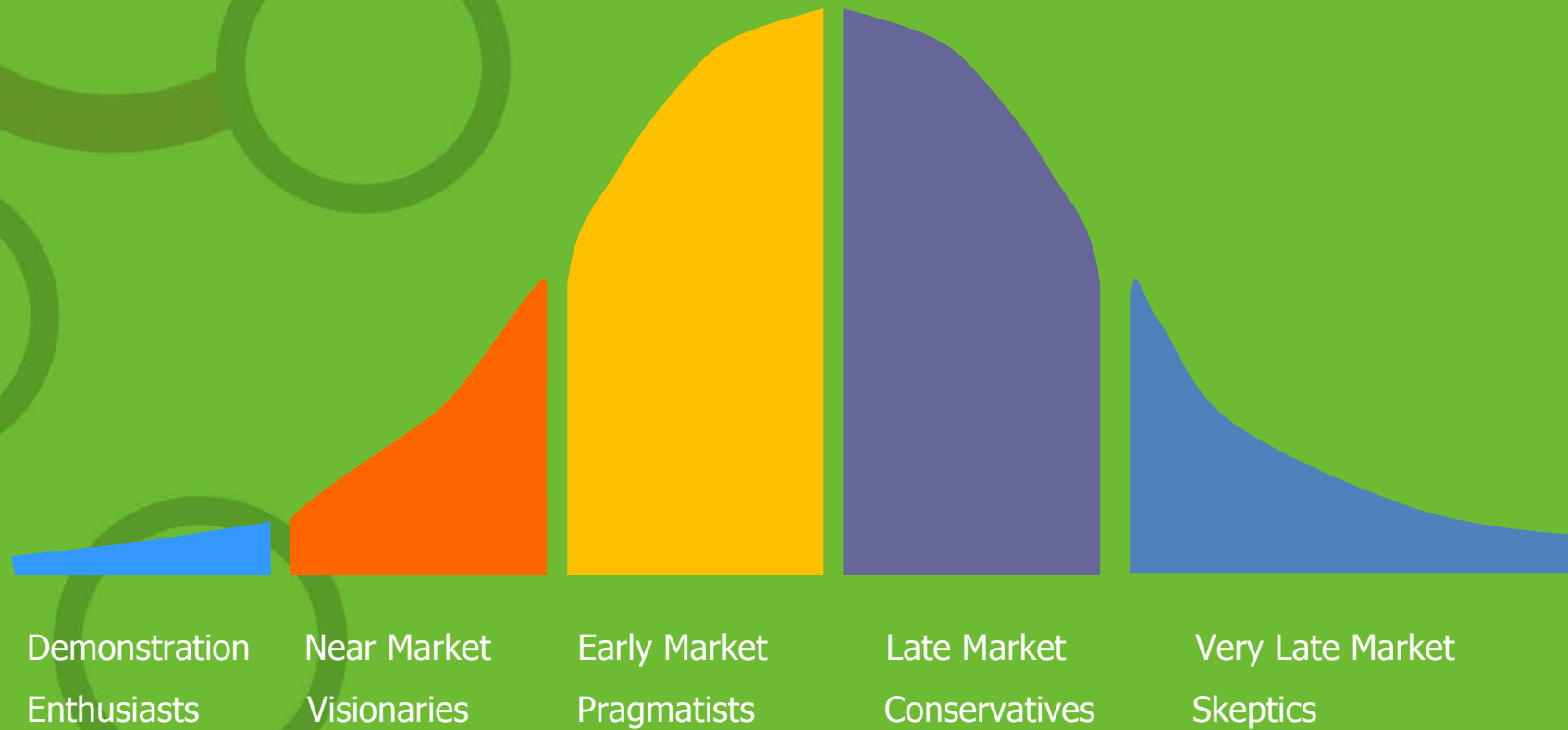


Organisation



Market – Uptake of New Technology “Cracks in the Bell Curve”

After Geoffrey A. Moore



The Challenge Of bringing New Energy Technologies to Market

The green curve shows public support in bringing new technologies to market

The red curve shows requirements in public funding to get to the market

"Valley of Death,"

Research & Development

Demonstration

Pre Commercial Phase

Commercial Phase With Public Support

Commercial Phase

Conclusions

- **Denmark has a strong national Partnership for Hydrogen and Fuel Cells and strong national strategies. For the moment focus at deployment is important.**
- **We all have the challenge of getting fast to market. The markets are huge, and there will be plenty of room for many different industrial stakeholders.**

So let's collaborate, - with openness, trust and mutual respect



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THE DANISH PARTNERSHIP

Danish Energy Industries Federation

www.hydrogennet.dk