



Hydrogen: A Clean Energy Choice

15th Annual U.S. Hydrogen Conference and Hydrogen Expo USA



April 26-30, 2004 | Renaissance Hollywood Hotel | Los Angeles, California, U.S.A.

Fueling Our Future: Setting the Stage for the Coming Hydrogen Economy

Arno A. Evers, Arno A. Evers FAIR-PR, Germany

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Contents:

- Still on Probation or Ready for Take-Off?
- Implementation Time of New Products
- Not Technical Possibilities but Consumer Demand
- Evolution of the Cellular Phone / Aircraft Industry
- World Motor Vehicle Production incl. P.R. China
- Necessary Conditions to the Final Goal:
Mass Demand will drive Mass Production
- Market Outlook: China
- Go to Where the Market is!

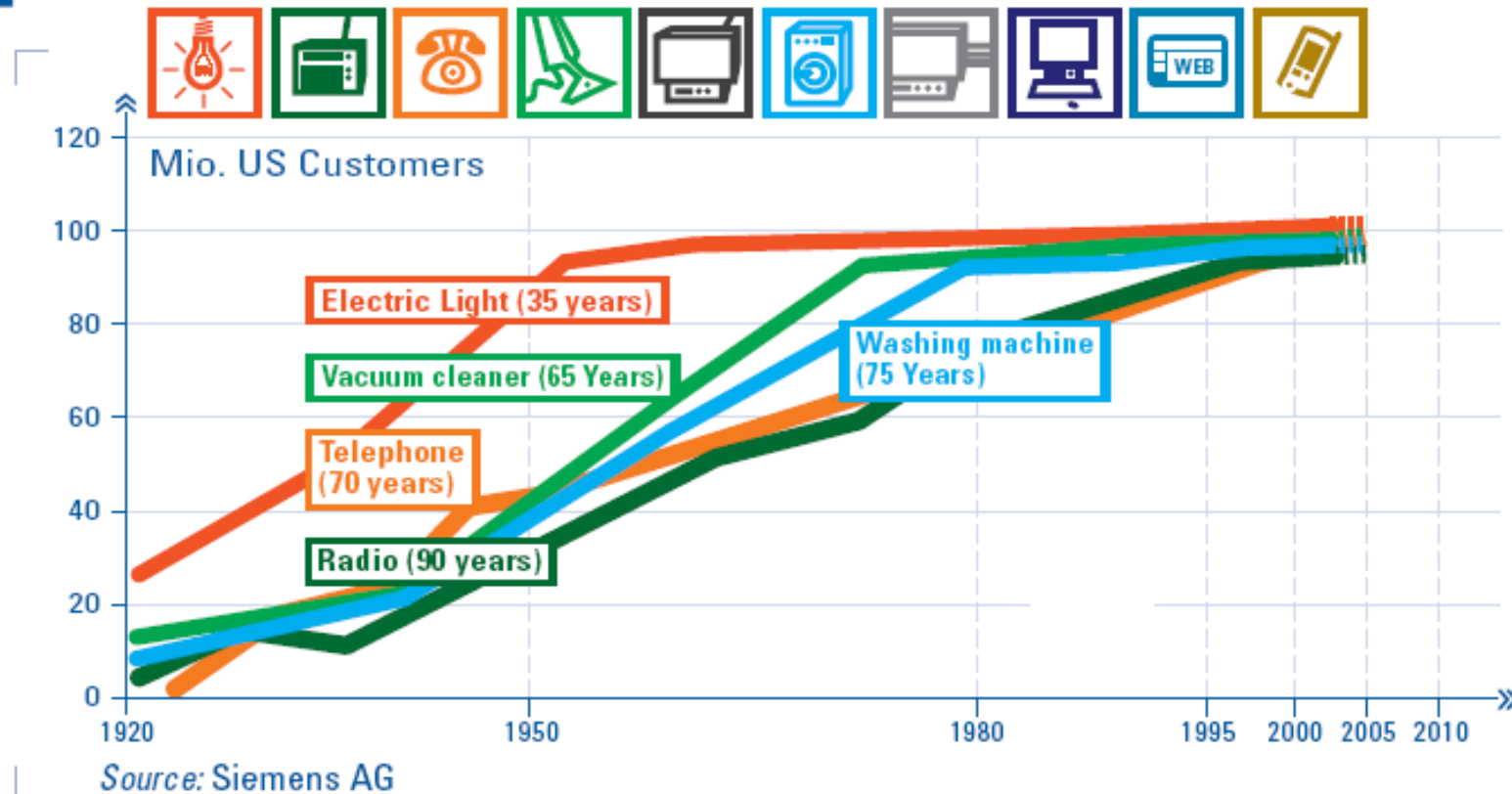
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Still on Probation or Ready for Take-Off ?

- Fuel Cells technology has been on worldwide probation for the last 30 years...
- Billions of US \$ – both from Private finance and Government funds - have already been invested
- Adoption was announced several times but often postponed...
- Critical Issues:
 - How long will it take to be commercial?
 - Will H2/FC be on probation for another 30 years?

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> Implementation time of new Products



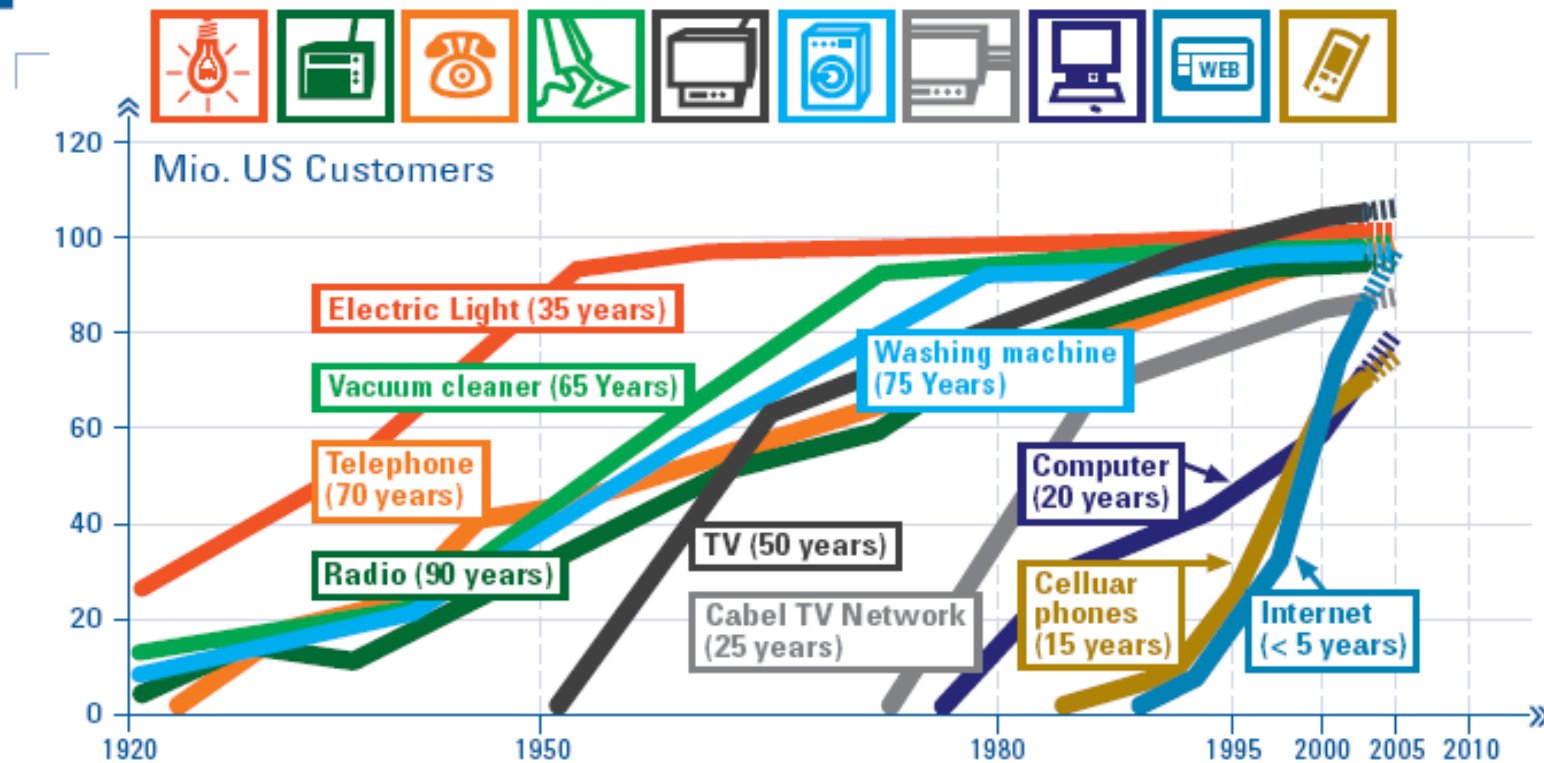
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> Implementation time of new Products



Source: Siemens AG

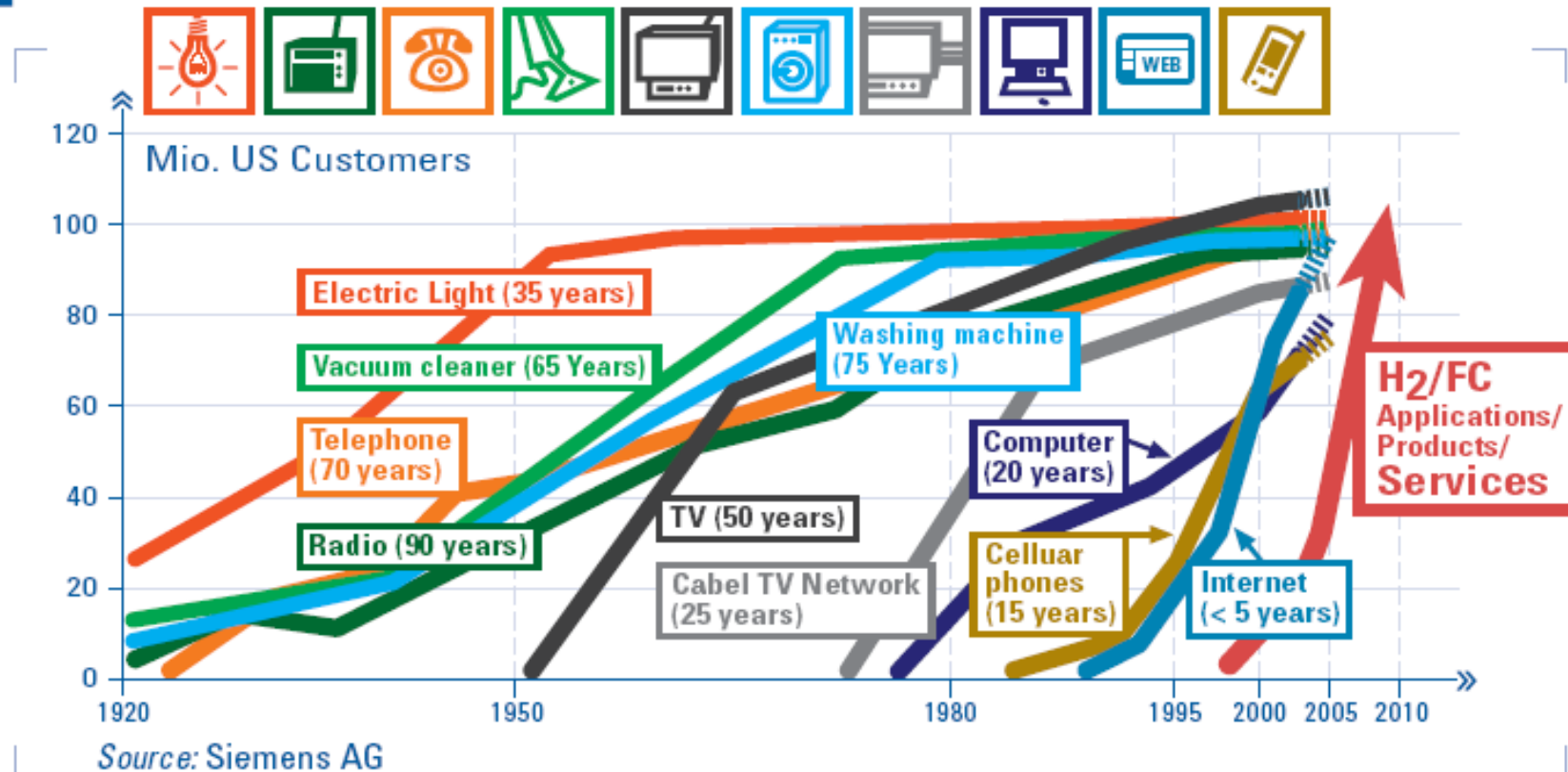
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> Implementation time of new Products



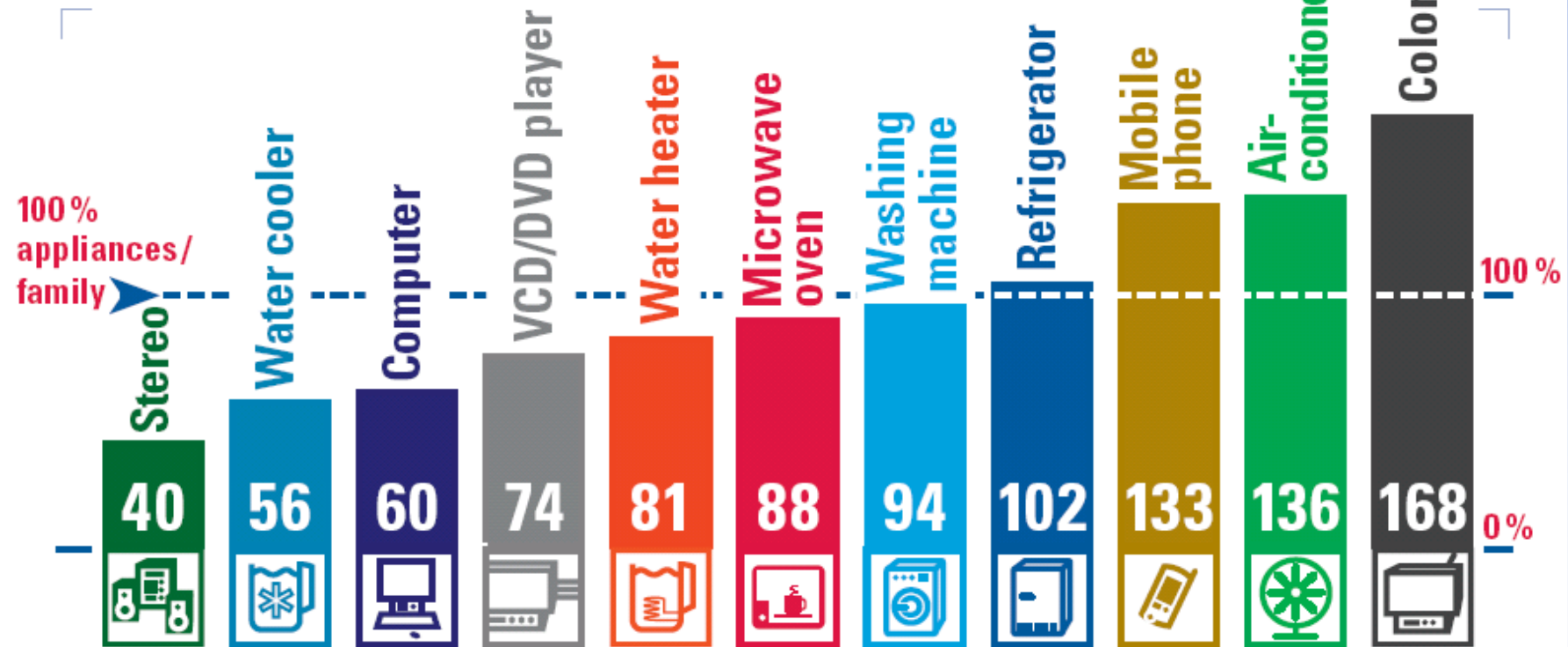
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> Home appliance ownership
in every 100 Shanghai, P.R. China, families



Source: Shanghai Statistics Bureau, Shanghai Daily, February 6, 2004

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Not Technical Possibilities but Consumer Demand

- The future of an H2/FC economy will not be dependent on the replacement of existing energy-powered products, but rather in products and/or services unknown today which will benefit our daily life tomorrow...
- Because of the “added value” benefits of these new products and/or services, this development is going to happen...
...sooner than many “experts” are thinking today!

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> Why do Customers buy new Products?



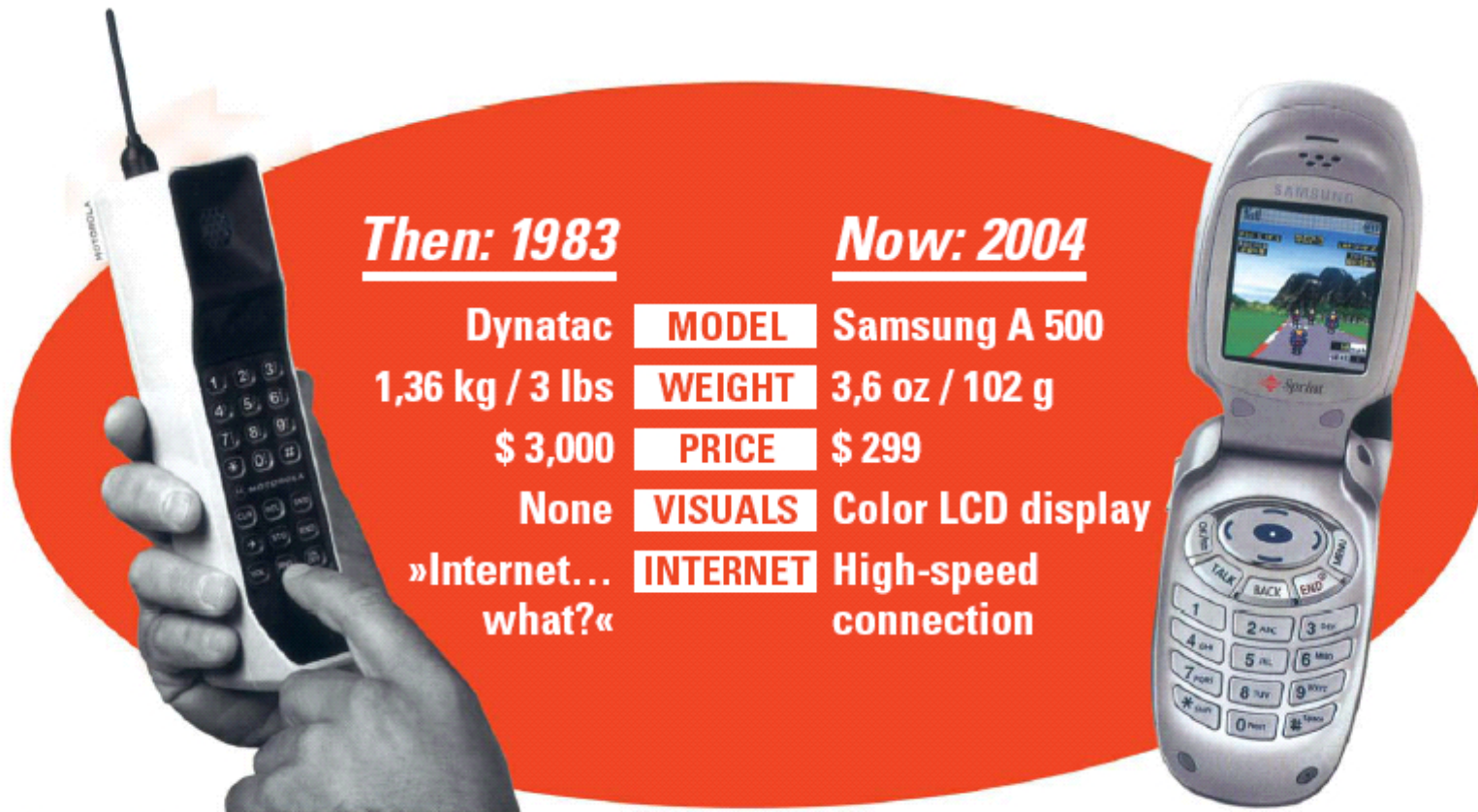
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> Evolution of the Cellular Phone 1983 – 2004



<i><u>Then: 1983</u></i>		<i><u>Now: 2004</u></i>
Dynatac	MODEL	Samsung A 500
1,36 kg / 3 lbs	WEIGHT	3,6 oz / 102 g
\$ 3,000	PRICE	\$ 299
None	VISUALS	Color LCD display
»Internet... what?«	INTERNET	High-speed connection

Source: Time Inc. Home Entertainment / Innovation in Our Time

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> Evolution in the Aircraft Industry 1903 – 2005

Orville and Wilbur Wright's Flyer



**First powered flight:
at a beach in Kitty Hawk, N.C.
December 17, 1903**

*Flight Distance*___: 882 ft / 269 m

*Flight Time*____: 57 seconds

*Passengers*____: 0

1903

Source: Time Inc. Home Entertainment / Innovation in Our Time

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> Evolution in the Aircraft Industry 1903 – 2005

Airbus A380

In commercial service: 2006
– starting with 11 Airlines

First flight: April 2005

Range _____ : 8.000 nm / 15.000 km

Wingspan ____ : 261 ft / 79,5m

Passengers _ : 555



Source: Airbus Industrie, Toulouse, France

2005

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> Evolution in the Aircraft Industry 1903 – 2005

Orville and Wilbur
Wright's Flyer

Airbus A380

102 years



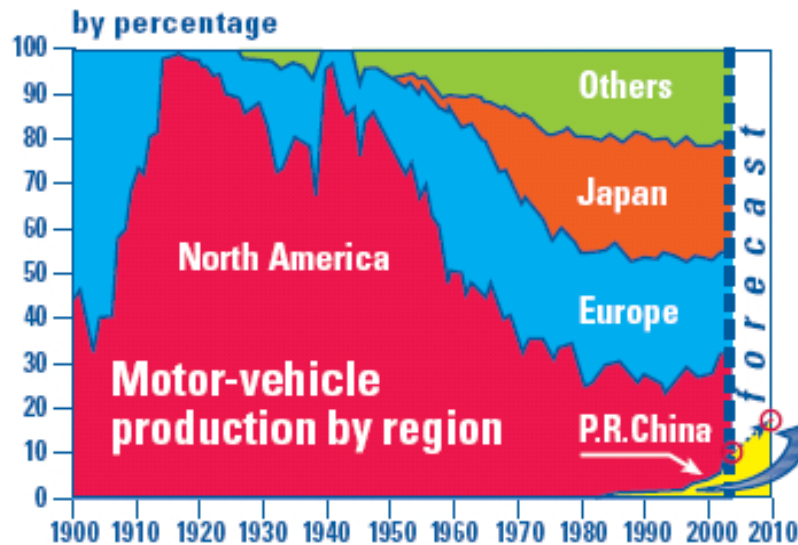
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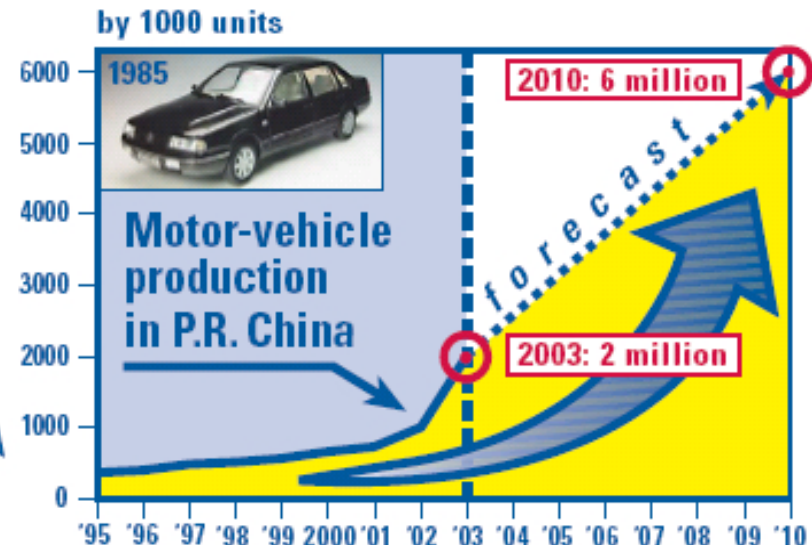
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> World motor-vehicle production incl. P.R. China 1900 – 2010



Source: Altshuter et al



Source: Prognose-Institut B&D Forecast

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New Players on the Chinese Automotive Market

- **AUX Group Co., Ltd.**
Ningbo, Zhejiang Province
- **Lifan Group Incorporated**
Shangqiao, Chongqing Province
- **Ningbo Bird Co., Ltd**
Zhejiang
- **China National Bluestar (Group) Corporation**
Beijing
- **Wulianye Distillery Yibin**
Yibin City, Sichuan Province

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New Players on the Chinese Automotive Market

- **AUX Group Co., Ltd.**
Plans to invest 8 Billion Yuan (US\$ 966 million) to produce cars over the next 4 years
- **Lifan Group Incorporated**
Plans to invest 500 Million Yuan (USD\$ 60.4 million) for initial manufacturing capacity- 50,000 cars & 50,000 engines
- **Ningbo Bird Co., Ltd**
Plans to produce cars in a base neighbouring Jiangsu Province end 2004
- **China National Bluestar (Group) Corporation**
Signed Letter of Intent with UK automaker Manganese Bronze Holdings to joint venture to make taxis
- **Wulianye Distillery Yibin**
Plans to invest in car manufacturing

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New Players on the Chinese Automotive Market

- AUX Group Co., Ltd.
Privately-owned Home Appliance maker
- Lifan Group Incorporated
China's largest private Motorcycle producer
- Ningbo Bird Co., Ltd
Manufacturer of Electronic communications (mobiles)
- China National Bluestar (Group) Corporation
State-owned conglomerate
- Wulianye Distillery Yibin

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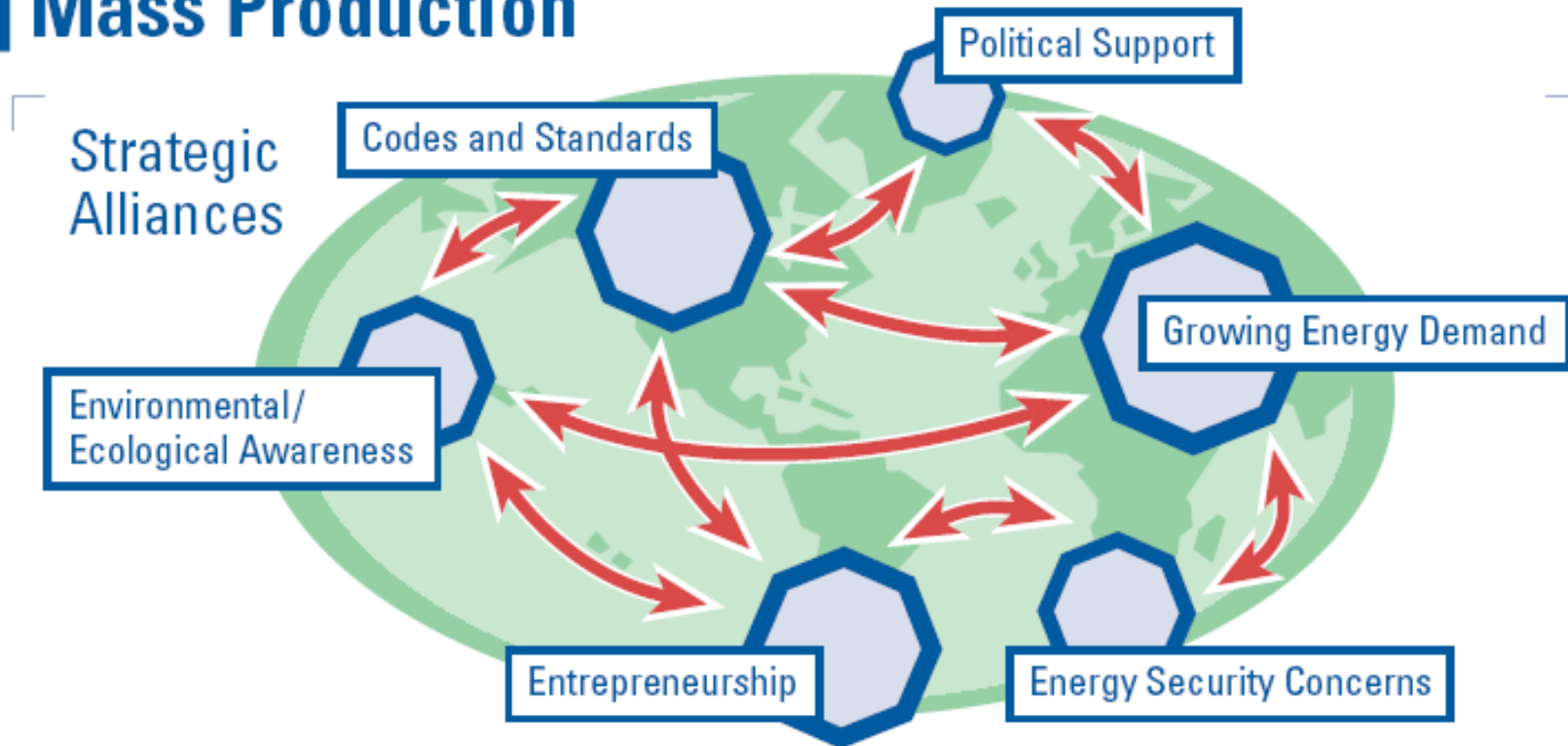
Alcohol producer

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> Necessary Conditions to the final Goal: Mass Production



Commercial products for worldwide commercial markets!

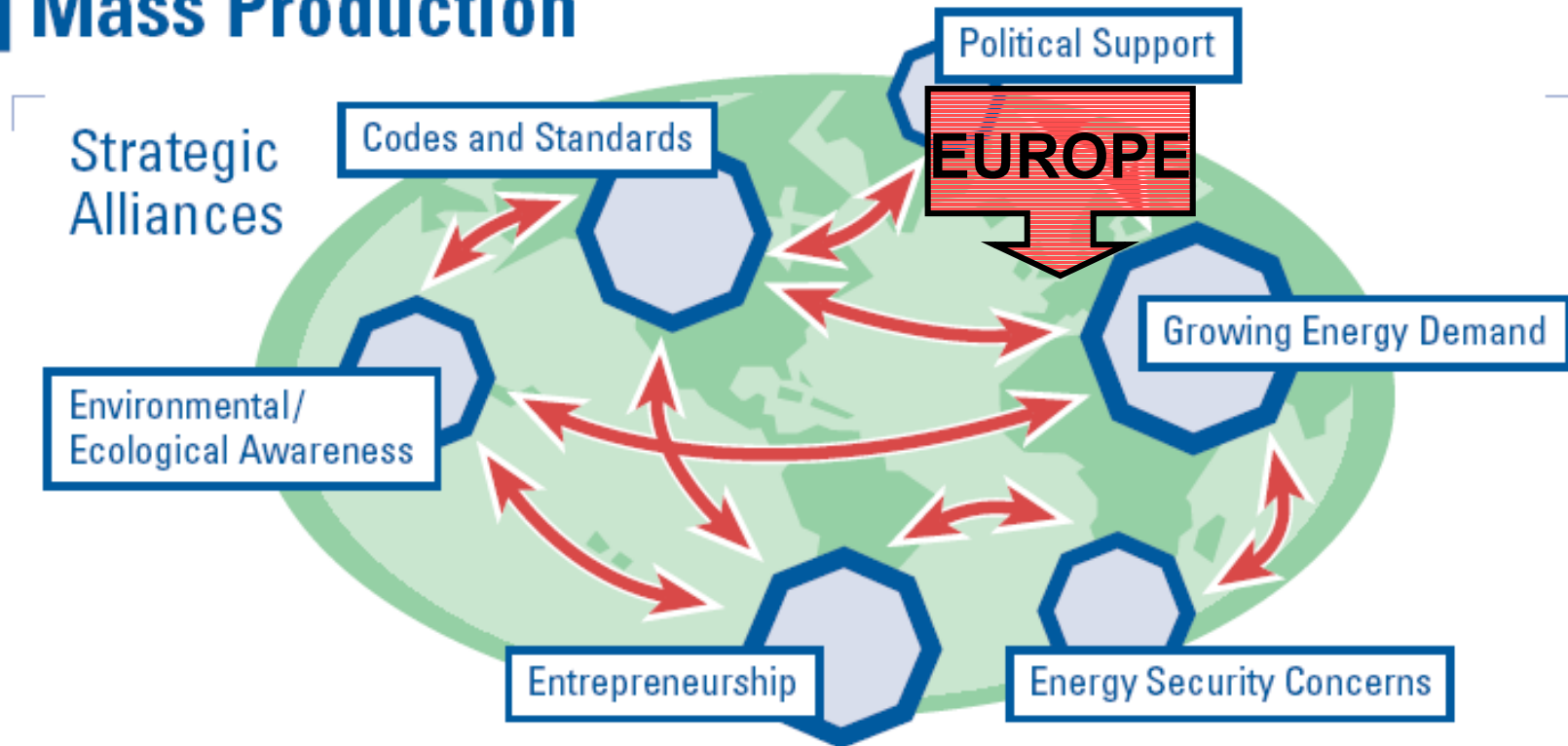
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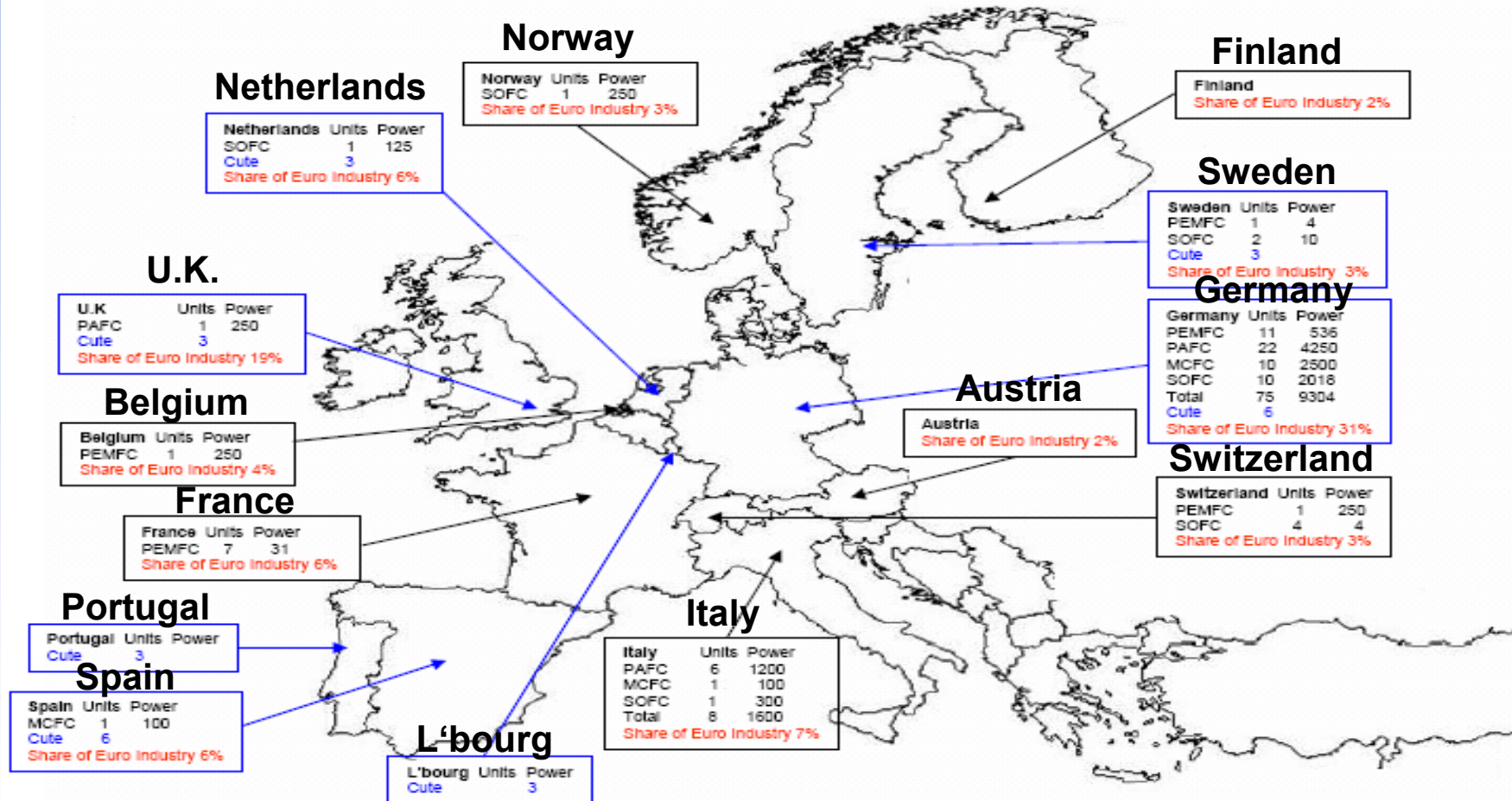
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European Map: 12MW Stationary, 27 Buses



Source: Phil Doran, Core Technology Ventures LLP

CORE TECHNOLOGY VENTURES LLP

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EUROPE: Some EU policy actions

- Action Plan on energy efficiency
 - Improving Energy Efficiency: +18% from 1995 to 2010
 - Increasing the Share of Co-generation: 12% of EU-15 electricity by 2010
- White Paper on Renewable Energies
 - Doubling the Share of Renewable Energies from 6 to 12% of final energy
- Communication on Alternative Fuels
 - Hydrogen: 5% of road transport fuel by 2020
visit http://europa.eu.int/comm/energy_transport/en/ga_en.html

Source: Dr. William Borthwick, DG Research – Energy Production and Distribution



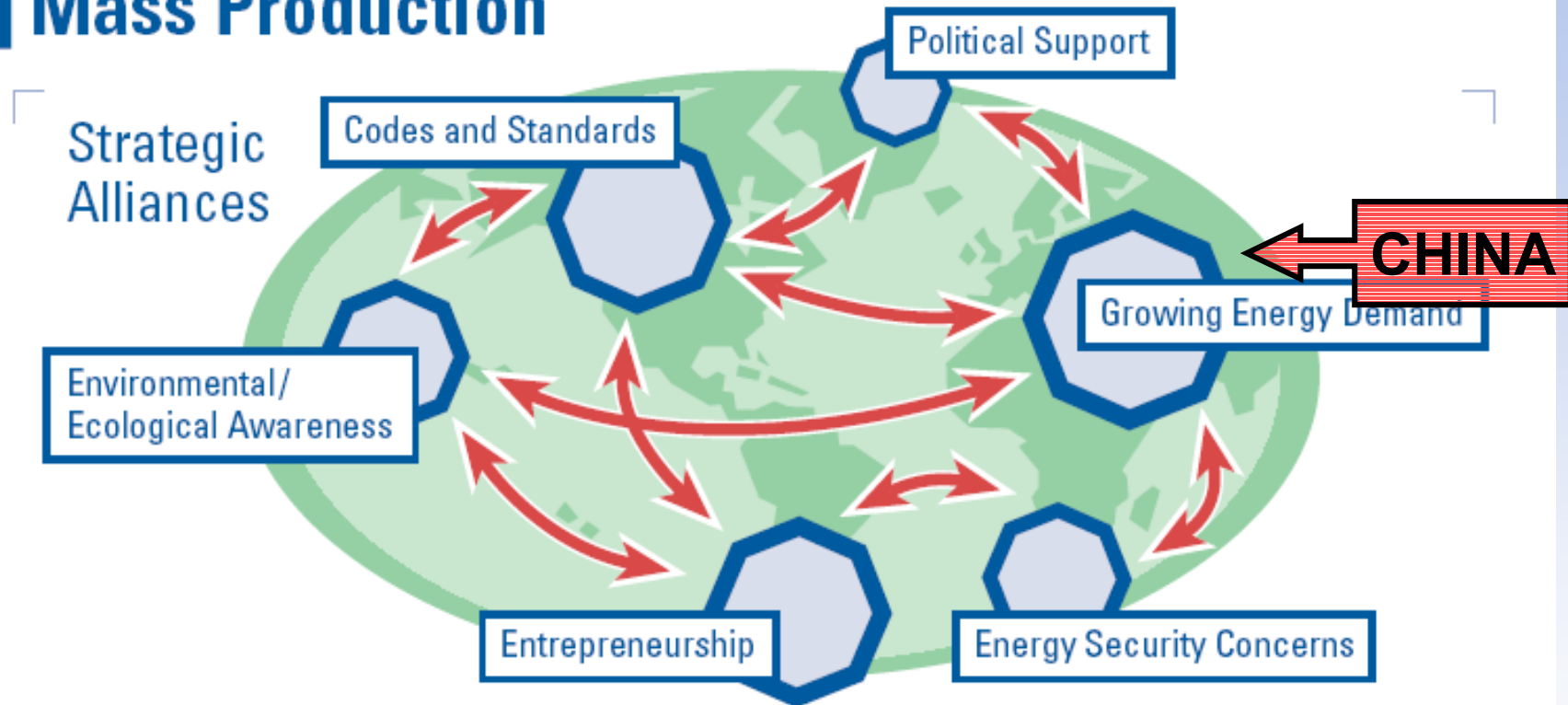
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> Necessary Conditions to the final Goal: Mass Production



Commercial products for worldwide commercial markets!

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CHINA: 10th Five-Year Plan (2001-2005)

- “863 High Technology Project”
 - Key Project
 - Fuel Cell Vehicle for Car and Bus
 - 33 million EURO
 - Fuel Cell Key Material Project
 - Membrane, Bipolar Plate
 - Future Energy Project
 - DMFC, MCFC and SOFC

Source: Dr. Honymei Yu, Dalian Institute of Chemical Physics, Chinese Academy of Sciences



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CHINA: 10th Five-Year Plan (2001-2005)

- “973 Project”
 - Hydrogen Energy (including Fuel Cells)
- National Natural Scientific Foundation (NSFC)
 - New Material, New Concept in Fuel Cells
- Chinese Academy of Sciences Key Project
 - Fuel Cell Engine and Hydrogen Technology
- Industry
 - Hydrogen Production from Natural Gas, Methanol and Gasoline

Source: Dr. Hony mei Yu, Dalian Institute of Chemical Physics, Chinese Academy of Sciences



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Necessary Conditions to reach the final Goal:

Mass Demand will drive Mass Production

- Many circumstances have to be added:

Which one is most important?

- Activation of First-Movers
- Growing Energy Demand
- Environmental / Ecological Awareness
- (Private) Entrepreneurship
- Energy Security Concerns
- and (less, please!!!) Political Support

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Group Exhibit Hydrogen + Fuel Cells HANNOVER FAIR

- The annual Group Exhibit has developed to be the biggest of its kind in the world since 1995.
- 100+ companies from 20 countries showed their latest developments in 2004
- HANNOVER FAIR 2004, April 19-24 celebrated our 10th anniversary

Go to www.fair-pr.com to check out all the onsite activities, photos and statements

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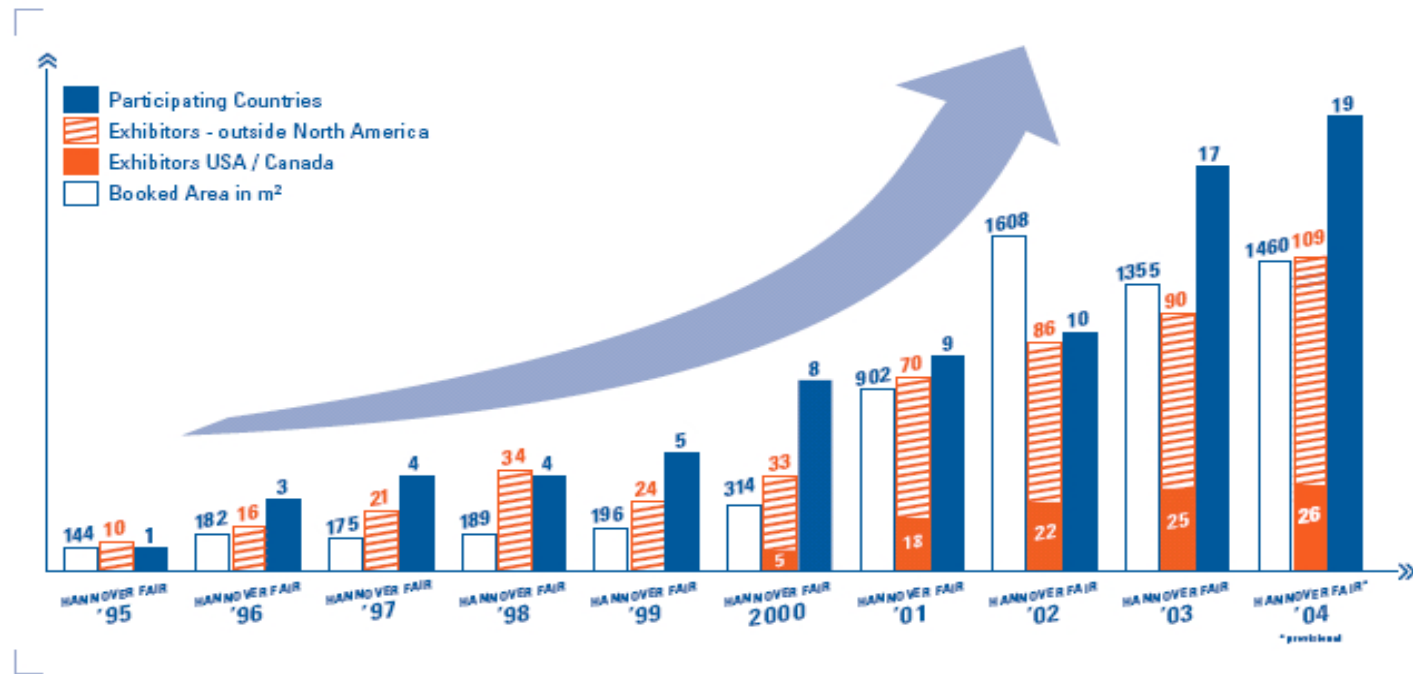
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Group Exhibits on Hydrogen + Fuel Cells
at the HANNOVER FAIR 1995 – 2004 ... more to come ...



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Arno A. Evers FAIR-PR - Microsoft Internet Explorer

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Google pace international Web-Suche Site-Suche PageRank Seiten-Info Aufwärts Hervorheben pace international



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GROUP X EXHIBIT
Hydrogen + Fuel Cells
April 07-12
HANNOVER FAIR '03

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Hydrogen + Fuel Cells
at HANNOVER FAIR '04
April 19-24**
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Orientation

- ▶ Preliminary Floorplan '04
- ▶ Artist Impression Forum Area
- ▶ Layout Hall 13
- ▶ Hannover Fair Ground
- ▶ Facts HANNOVER FAIR '04


[Special Meeting Room available](#)

[Forum Program](#)

[The H2/FC VIP Meeting Point](#)

[Exhibitors'03 by Branch](#)

10th Anniversary Special



picture shows **HANNOVER FAIR 2003**

Welcome to the Group Exhibit
Hydrogen + Fuel Cells

Internet

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