



# CoreTec Ventures

Eleventh Grove Fuel Cell Symposium  
Building on Fuel Cells Industries

**“The Corporate Structure of the European H2&FC  
Industry: the failure to finance independent  
developers”**

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## CoreTec Ventures H2&FC Industry-Facing Activities

	Company		Network			
<b>Network / Company</b>				 Fuel Cell Europe		
<b>Activity</b>	<i>Novel PEM Cathode Developer</i>	<i>Carbon nano-tubes manufacture</i>	<i>Roads2Hycom €4.5m EU-funded project</i>	<i>European Fuel Cell Industry Association</i>	<i>Set up by UK Govt in response to the threat of climate change</i>	<i>Set up by the UK Govt to promote UK Business, Innovation and Skills</i>
<b>Core Tec</b>	<i>Supply chain evaluation; Formal introductions to Core Tec industry contacts</i>	<i>Assessment of potential location in supply chain, Formal introductions to Core Tec industry contacts</i>	<i>Finance partner in this consortium, (29 Partners), which is charged with describing &amp; analysing the EU H2&amp;FC industry</i>	<i>Founding Board Member (2001)</i>	<i>Contracted to support UK companies and universities with their H2&amp;FC activities</i>	<i>Steering committee member of the KTN  Assessor for funding competition</i>

# CoreTec Ventures: Finance Market-Activities

	Private Finance		Stock Market Listings	
Company				
Activity	<i>Novel PEM Cathode Developer</i>	<i>Contract Research Organisation</i>	<i>SOFC System developer</i>	<i>PEMFC System Developer</i>
Core Tec Role	<i>Advice with early-stage capital raising</i>	<i>Advice with a £10m capital raising</i>	<i>Advice and project management of technical due diligence for stock market listing</i>	<i>Advisor on Management Buy-out, project management of technical due diligence leading floatation on London's AIM, Identification of key non-executive director</i>

# CoreTec's Position:

❖ **This presentation is informed by the following:**

1. parts of the H2&FC industry face limited if any scale effects or so-called indivisibilities i.e. do not require huge sums of capital to be developed as is the case with the installation of a new country-wide infrastructure, and
2. at the same time represent disruptive technologies, i.e. technologies that will, on the one hand radically change the way we produce and consume goods across many industries, as did e.g. electrification, gasification & computers, and on the other, enable new, as yet unforeseen products,

**Thus, the probability is that much of the new technology comes from previously non-existing companies. Emerging companies are more flexible, have significantly shorter decision chains and are not captured or trapped by an existing culture, prejudice or business model.**

- ❖ Empirically, one would anticipate the structure of such an emerging industry to be numerically dominated by poorly resourced start-ups and early stage companies as well as universities & research institutes .... and that is exactly what Europe looks like, empirically!
- A. A glance at the public financial instruments made available to promote this industry show that most are of little or no use to micro companies: They have little if any revenues, cannot raise debt, and cannot, in the main benefit from tax breaks. **What they need is equity-based financing.**
  - B. Most corporates that have recognised the risk fuel cells pose have reacted by buying specific risk at huge cost
  - C. Meanwhile, start-ups could do more to help themselves by taking the time to understand what motivates financial investors and what constraints they face

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# Outline

## ❖ **Euro Fuel Cells & the Scarcity of Public Funding for Micro Firms**

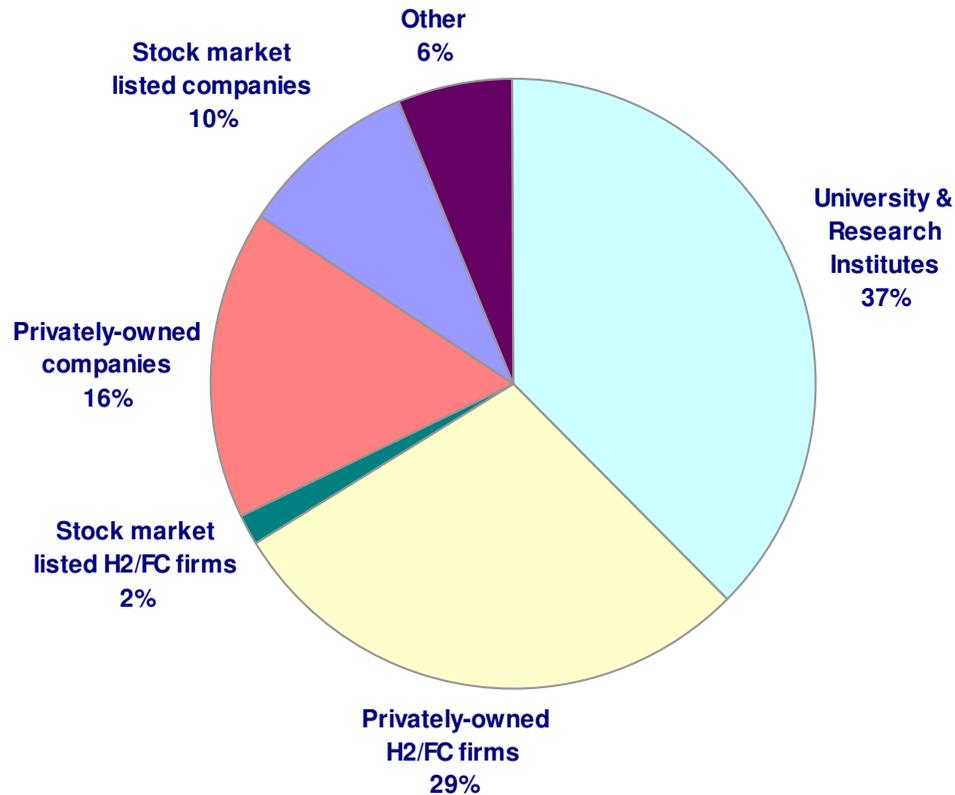
- ❖ Corporate Structure of the European H2&FC Industry
- ❖ Sources of Funds
- ❖ Financing Fuel Cells: Type of Entity & Available Financing Instruments

## ❖ **Corporates, Fuel Cells and Investor Concerns**

- ❖ The Shortcomings of (most) Corporates
- ❖ Hype, the Price Performance of Fuel Cell & Investor Time Horizons
- ❖ New Companies often fail to appreciate ...
- ❖ Investor Requirements of the Management
- ❖ Investor Requirements of the Business Model
- ❖ Closing Remarks

# Corporate Structure of the European H2&FC Industry:

## Data from Roads2HyCom Survey\*

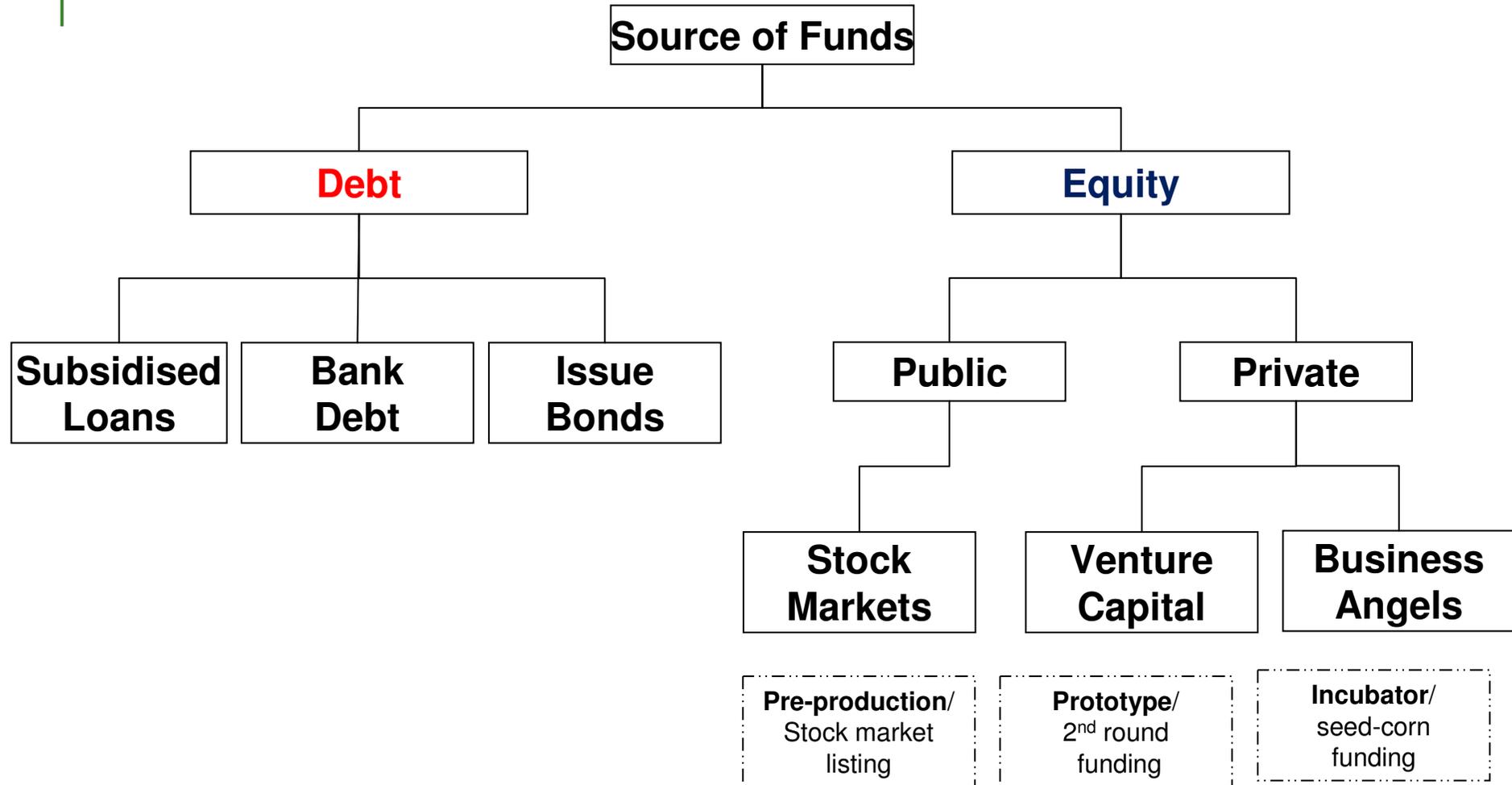


## Nomenclature

- ❖ **“University & Research Institutes”**  
Institutions developing H2&FC technologies, E.g. Fraunhofer, ECN
- ❖ **“H2&FC Firms”**  
‘Micro-firms’, predominantly focused on the development of H2&FC technologies, E.g. Stock mkt listed: CFCL, IdaTech  
E.g. Privately owned: ACAL, Nedstack
- ❖ **“Companies”**  
Well-capitalised, economically successful corporates, whose existence is not dependent on the success of H2&FC  
E.g. Stock mkt listed: JM, SGL Carbon,  
E.g. Privately owned: Schunk, Haldor Topsoe
- ❖ **“Other”**  
Service companies

Europe is dominated by independent (micro) and academic organisations

# Sources of Finance



Newly established companies are essentially limited to seed & early-stage financing

# Financing Fuel Cells: Type of Entity & Available Financing Instruments

	Sources of Funding					
	Retained Profits	National Govt. Tax Breaks	National Govt. & EU Grants	Issue Debt: Loans / bonds	Public Equity Market	Private Equity Market
Stock Mkt listed companies (10%)	✓	✓	✓	✓	✓	
Privately-owned Companies (16%)	✓	✓	✓	✓		
Stock Mkt listed Micro H2&FC firms (2%)			✓	✓	✓	
Privately-owned Micro H2&FC firms (29%)			?			✓
Academic Developers (39%)	Contract Work		✓			

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# Corporates, Fuel Cells and Investor Concerns

**“In every industry, large companies promote safe,  
predictable bureaucrats”**

**Economist Survey of Emerging Technologies, Oct 1993**

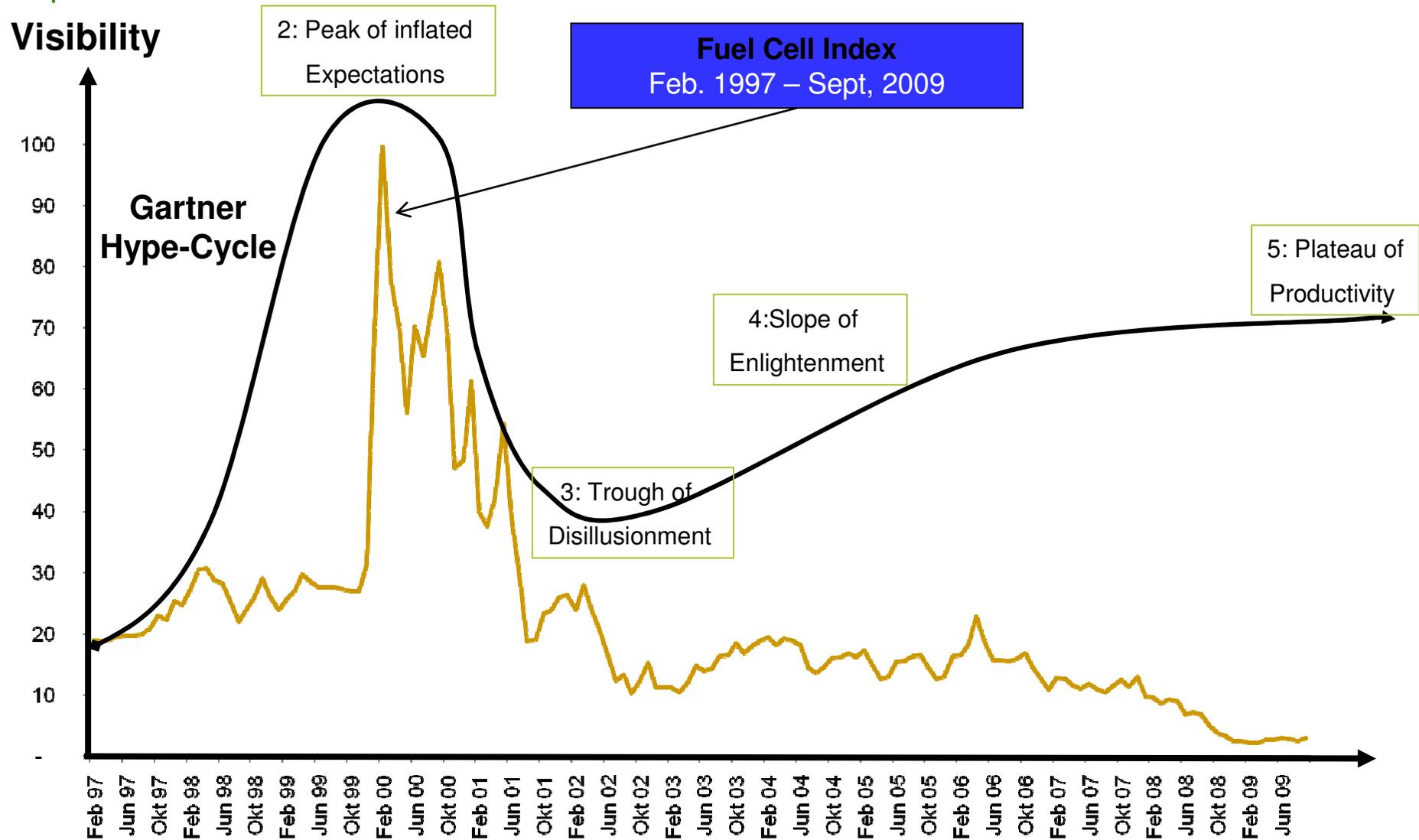
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## The Shortcomings of (most) Corporates

- ❖ Fuel cells present a risk to many corporates across a wide range of industries, e.g. the power, automotive, consumer electronics, chemicals and components industries
- ❖ Suppliers of materials and components, for example – may lose out if they have not acquired enough “coalface” experience to make the relevant strategic and capital commitments
- ❖ Equally, suppliers of conventional energy systems – could lose out should they fail to acquire direct and relevant experience of H2&FC industries as they unfold
- ❖ A failure to manage the risk adequately that fuel cells represent could damage future commercial prospects, or even put the company out of business in the long run. The problem is how best to manage the risk and what price to pay in the process
- ❖ Our experience indicates that, with a few notable exceptions, most EU companies have either not reacted at all, or have sought to manage their risk by acquiring specific risk, i.e. have bought into individual fuel cell companies. But the acquisition of specific risk, i.e. putting all your eggs in one basket, is a poor insurance policy.
- ❖ In our view, corporates would be well advised to diversify their risk by the adoption of a portfolio approach i.e. by pooling resources with other corporates and financial investors outside the confines of a corporate culture. A portfolio approach spreads risks by the acquisition of stakes in a range of companies and technologies

# Gartner, Fuel Cell Performance & Investor Time Horizons



1: Technology  
Trigger

# New Companies often fail to appreciate ...

- ❖ The Fact that investors interests are limited by relatively short time periods
  - ❖ Governments are driven by long term economic growth (Welfare / Employment)
  - ❖ Corporations are driven by long-term survival
  - ❖ Financial investors are driven by short to medium term cash flows
  - ❖
- ❖ The Fact that H2&FC Companies are not Ordinary Equity Investments
  - ❖ Investment outcome is potentially binary i.e. many H2&FC businesses face huge success or catastrophic failure
- ❖ The Need to provide evidence of real 3rd party risk sharing such as
  - ❖ Partnerships in R&D, marketing and product development
- ❖ An Appreciation of the Risk Concerns of the Investor, including:
  - ❖ Regulatory risk (e.g. Policy shifts)
  - ❖ Technical risk and crucially
  - ❖ Management
  - ❖
- ❖ That the Returns on early stage investments on Average Result in:
  - ❖ 34% total loss
  - ❖ 13% partial loss or breakeven
  - ❖ 17% returns greater than 25%
  - ❖ 13% returns between 25 – 49%
  - ❖ 23% returns greater than 50%

(Source C. Mason; R. Harrison)

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# Investor Requirements of the Management

- ❖ High level of personal commitment (often evidenced by earlier financial commitment)
- ❖ Understand the technology and its potential commercial applications
- ❖ Focussed on product not technology (Sales = Products). This translates into the realisation that “commercial” implies that the residual of Sales less Costs is positive (Profits)
- ❖ Willingness to engage and delegate responsibilities to appropriately qualified staff
- ❖ Willingness to share profits – with staff and shareholders
- ❖ Willingness to relinquish control

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# Investor Requirements of the Business Model

- ❖ Protected technology (preferably utilised in application-specific development) and/or technological lead over competitors
- ❖ Transparent 'unique selling point' – what problem is solved
- ❖ Technology addresses large and/ or strongly growing markets
- ❖ Scalable business plan (i.e. The ability to grow revenues faster than costs – falling average fixed costs)
- ❖ Realistic manufacturing strategy
- ❖ Supported by well-defined development and financial milestones
- ❖ Transparent exit strategy for investors, through either stock market listing or trade sale

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# Closing Remarks

**Large increases in cost with questionable increase in performance can be tolerated only for race horses and fancy spouses.”**  
**Lord Kelvin (1824 – 1907)**

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# Closing Remarks I

- ❖ We now know that the European fuel cell sector is dominated by micro companies and academics, as might be expected with a disruptive technology with minimal scale effects
- ❖ Potential academic spin-outs and emerging companies are essentially limited to seed & early-stage financing, i.e. Risk capital, or in other words Equity-based financing
- ❖ Despite the fact that fuel cells are disruptive and offer the prospect of simultaneously meeting a number of government policies, the vast majority of government financial support within Europe is wholly unsuited to the development of an industry with these characteristics

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# Closing Remarks II

## ❖ Governments

- ❖ Most government efforts are centred on subsidies devoted to resident companies and are unsuited to the promotion of independent developers
  - ❖ On the one hand the Member States should look to build on and expand the UK Carbon Trust and NESTA models of providing equity directly
  - ❖ Member States could promote accredited practical financial training, i.e. not micro-economics, for science students through to PhD level and offer similar free or at least low cost courses to independent developers
  - ❖ The EU could provide equity financing directly by establishing a European Trust Fund for future generations, which would have the advantage of prompting the best in Europe

## ❖ Corporates:

- ❖ Those corporates that have woken up to the (positive &/or negative) risks fuel cells pose are managing their wider risk exposure by buying specific risk at huge cost
  - ❖ Corporates would be well served by establishing a portfolio approach in collaboration with other corporates and expert financial investors free of the company's culture
  - ❖ This approach reduces risks, lowers the cost of knowledge acquisition and provides long-term due diligence on an emerging industry

## ❖ Fuel Cell Developers

- ❖ Finance is fundamental to the development and commercialisation process; While it is no guarantee of success, its absence is a guarantee of failure
  - ❖ Micro companies would enhance the probability of raising funds by taking the time to understand the motivations of financial investors and the constraints they face

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## References

1. Roads2HyCom, January 2009: Deliverable 6.2.2, 'Socio-Economic Conditions for Fuel Cell & Hydrogen Technology Development: Section 2 – Finance and Business Development'. Document Number R2H6036PU.1.  
Available at [www.roads2hy.com](http://www.roads2hy.com)
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4. K Campbell 2003 Smarter Ventures: a Survivor's Guide to Venture Capital Through the New Cycle (Prentice Hall).