



European Union Teach-In Brussels July 2002

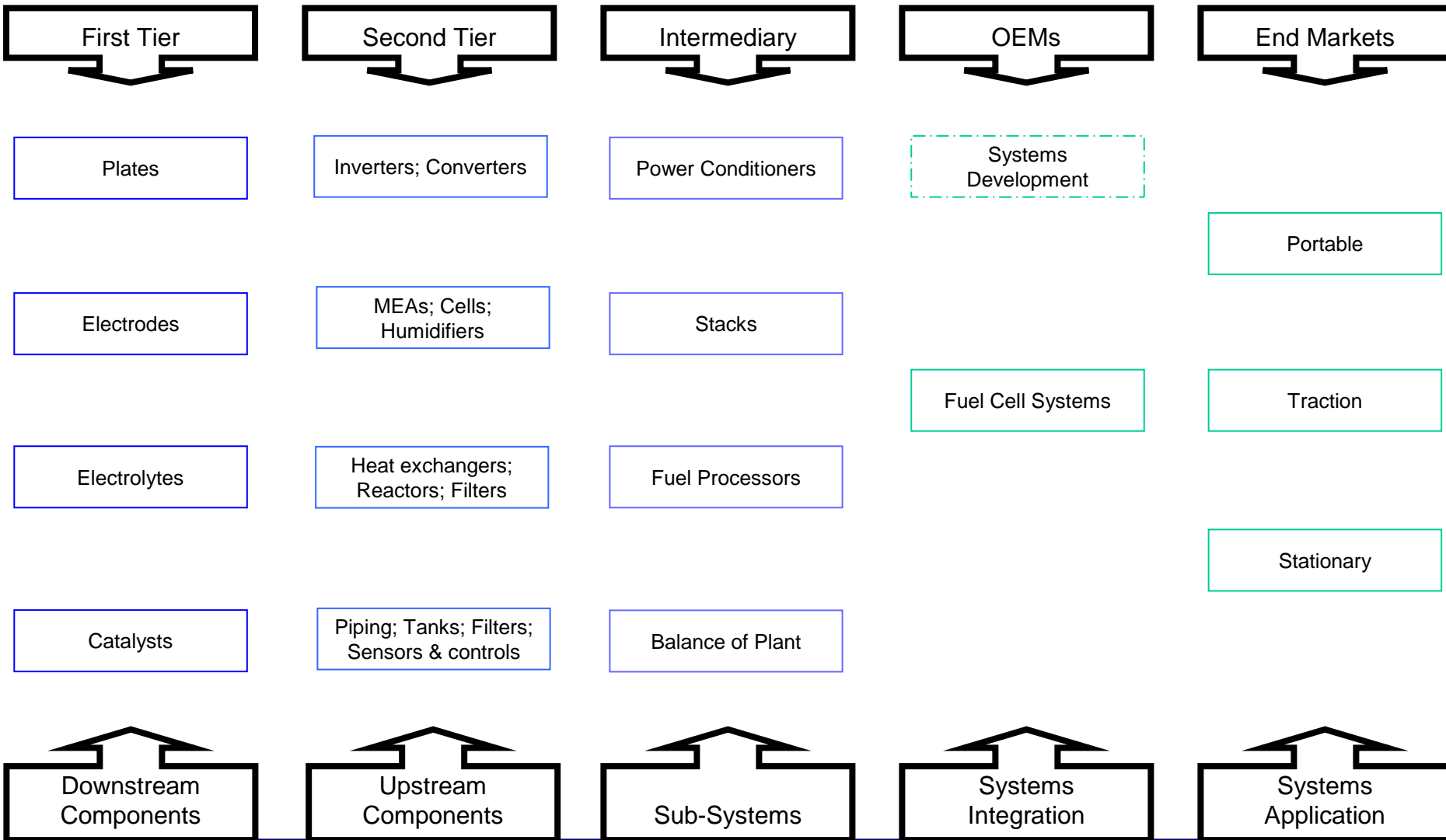
Components – A Strength and Opportunity for Europe

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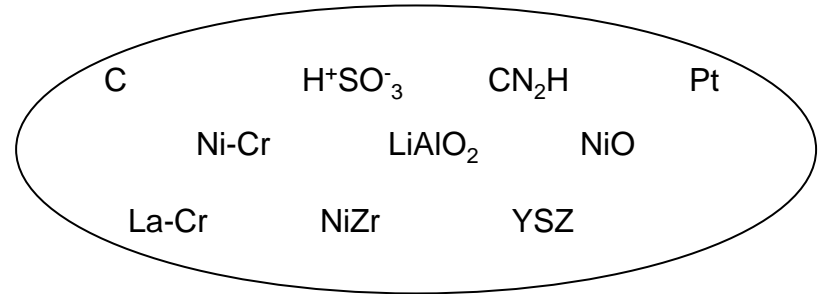
Simplified Fuel Cell Supply Chain



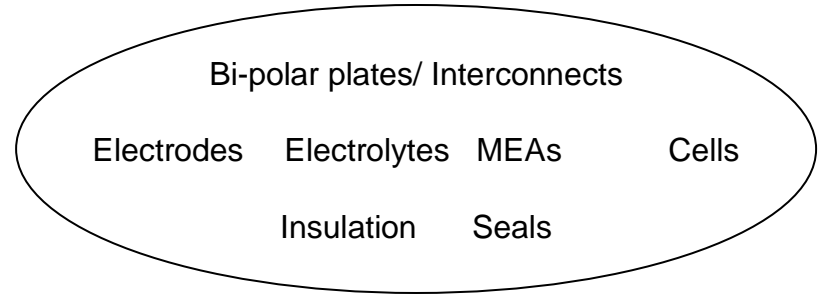


A Global Supply Chain

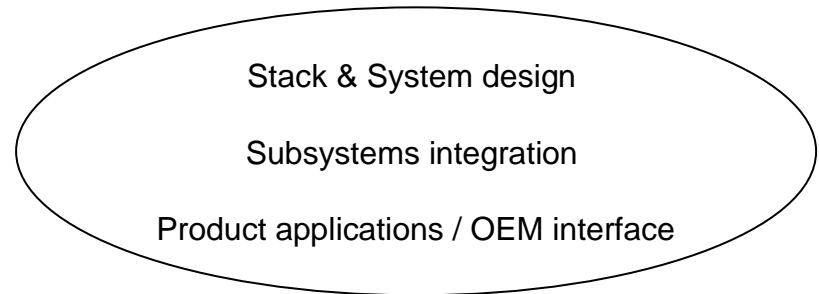
If basic materials form the letters



And components form the words



Then systems developers write the text





Fuel Cell Systems Developers

N. America	Control	Public/ Private	Market* Cap. (\$m)	Europe	Control	Public/ Private
Astris Energi Inc	Core	Public	n.a.	HelioCentris	Core	Private
Ballard Power Systems	Core	Public	1,677	H-Tec	Core	Private
DCH Technology	Core	Public	3*	Helion	Core	Govt.
Energy Visions	Core	Public	4	Intelligent Energy	Core	Private
Fuel Cell Energy	Core.	Public	358	Nedstack	Core	Private
Global Thermoelectric	Core	Public	78	Nuvera	Core	Private
H-Power	Core.	Public	42	Proton Motor	Core	Private
Hydrogenics	Core.	Public	159			
Manhattan Scientifics	Core.	Public	19			
Millennium Cell	Core	Public	75			
Plug Power	Core	Public	383			
Proton Energy	Core	Public	103			
ECD	Core	Public	334			
Core Market Capitalisation			\$3,235	Core Market Capitalisation		ZERO
Acumentrics	Core	Private				
Nuvera	Core	Private				
Avista Labs	Subsidiary	Public		Alstom	Subsidiary	Public
General Motors	Subsidiary	Public		Ansaldo	Subsidiary	??
Maxwell Technologies	Subsidiary	Public		DaimlerChrysler	Subsidiary	Public
Mechanical Technology	Subsidiary	Public		Regenesys	Subsidiary	Public
Motorola Labs	Subsidiary	Public		Rolls Royce	Subsidiary	Public
Siemens Westinghouse	Subsidiary	Public		Siemens	Subsidiary	Public
UTC	Subsidiary	Public		Rolls Royce	Subsidiary	Public
				Sulzer Hexis	Subsidiary	Public

*Prices As of Tuesday July 9th 2002.



Conclusions

- The potential size of the fuel cell industry is huge implying huge investment requirements and corresponding job opportunities
- The fuel cell supply chain has many links and is still being developed
- The component suppliers that make up the chain are constrained by the basic R&D on the one side and by the system developers on the other
- Europe has an abundance of component players and a relative shortage of system developers
- In the next few years component suppliers will make investment decisions based on where fuel cell markets are likely to emerge first
- Given the fiscal, financial and regulatory incentives on offer in the US as well as the number of North American system developers, the US will probably attract most fuel cell capital. The danger for Europe is that its components players will export both capital and jobs to the US
- The fact that European fuel cell companies have little or no access to private finance, a disadvantage exacerbated by the collapse in investor confidence, only contributes to Europe's relative weakness