



The miracles of science™



DuPont Fuel Cells

Accelerating the power of clean energy

Presented to

North Carolina Fuel Cell Alliance

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Paul Tangeman
DuPont Fuel Cells

DuPont at a Glance

2003 Consolidated Sales - \$27 billion

Operations in 70 countries, with more than 50% of sales outside U.S.

Diverse

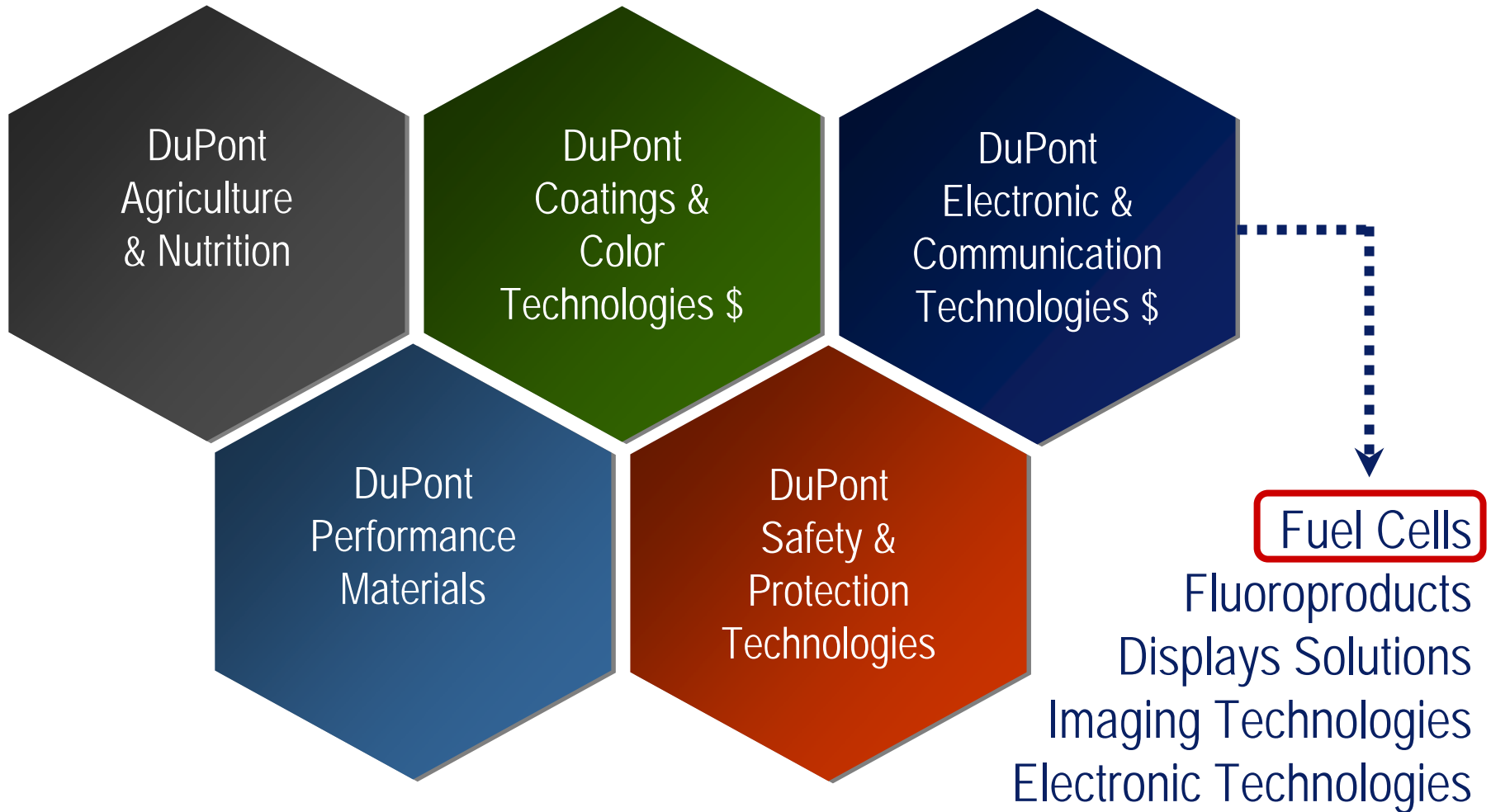
- ***135 manufacturing and processing facilities worldwide***
- ***81,000 employees, 35% outside U.S.***

The Vision of DuPont

To be the world's most dynamic science company, creating sustainable solutions essential to a better, safer, healthier life for people everywhere.



Five Growth Platforms of DuPont



DuPont Fuel Cells - Business Mission

Become the leading global supplier of PEM fuel cell membranes and components.

- ***Membranes, Dispersions, and Membrane Electrode Assemblies.***
- ***Multi-Fuel Solutions for H₂, Reformate and DMFC.***
- ***Drive improved performance, lower cost, and supply reliability.***
- ***Support early commercial projects.***

“Powered by DuPont”

A comprehensive portfolio of high performance PEM fuel cell products.

DuPont Fuel Cells - History & Milestones

- 2000** - Dupont Fuel Cells launched, Director named
 - Integrated Business team from several separate thrusts
- 2001** - Accelerated efforts in Product / Process Development
 - Hydrogen MEAs and Conductive Plates
- 2002** - DMFC equity partners
 - Films and Dispersions - "Pipeline" of improvements
- 2003** - Achieve commercial status with MEA3 and MEA5
- 2004** - First Fruits from increased PEMFC durability efforts

PEMFC - Excellent Fit for DuPont

- Nafion[®] PEMFC Technology and Future Volume / Price Capability
- Polymer Science
- Catalysis
- Analytical Science
- Fabrication Techniques
- Manufacturing Scale and Quality
- Supply Reliability
- Application Engineering and Development
- Global Reach

Fuel Cell Applications



Industrial



Stationary



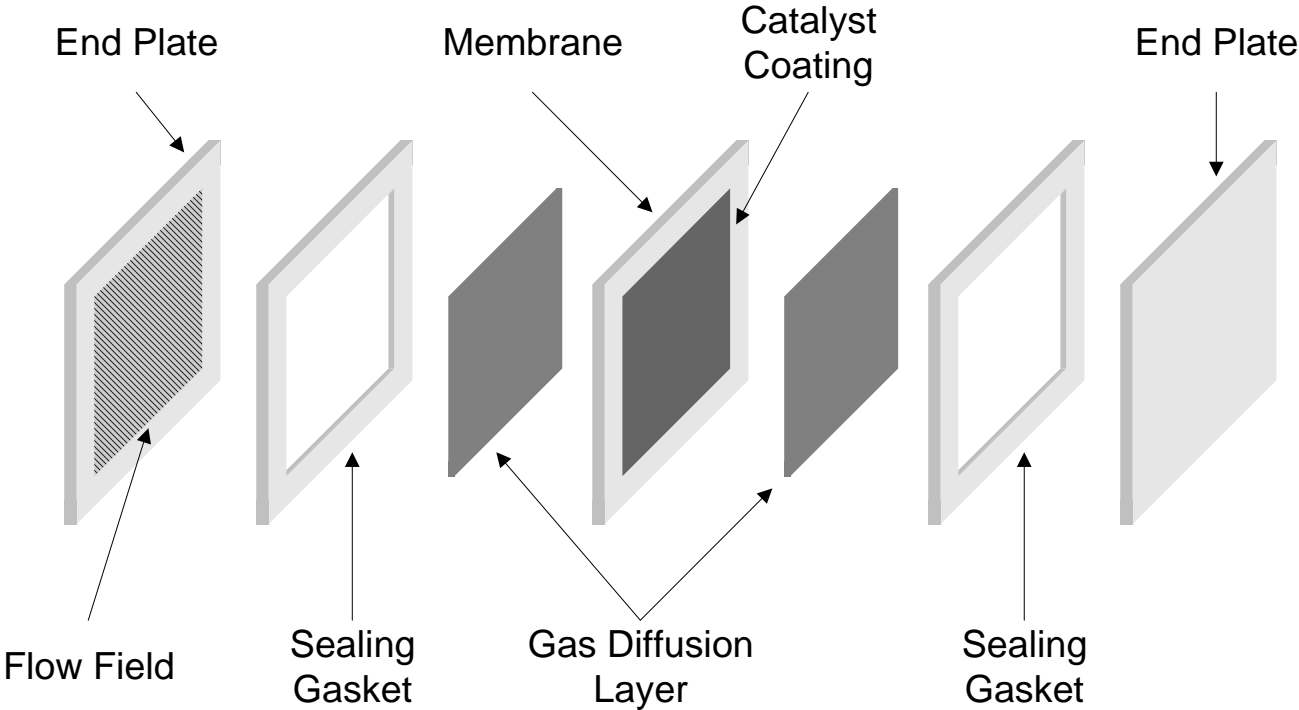
Portable



Transportation

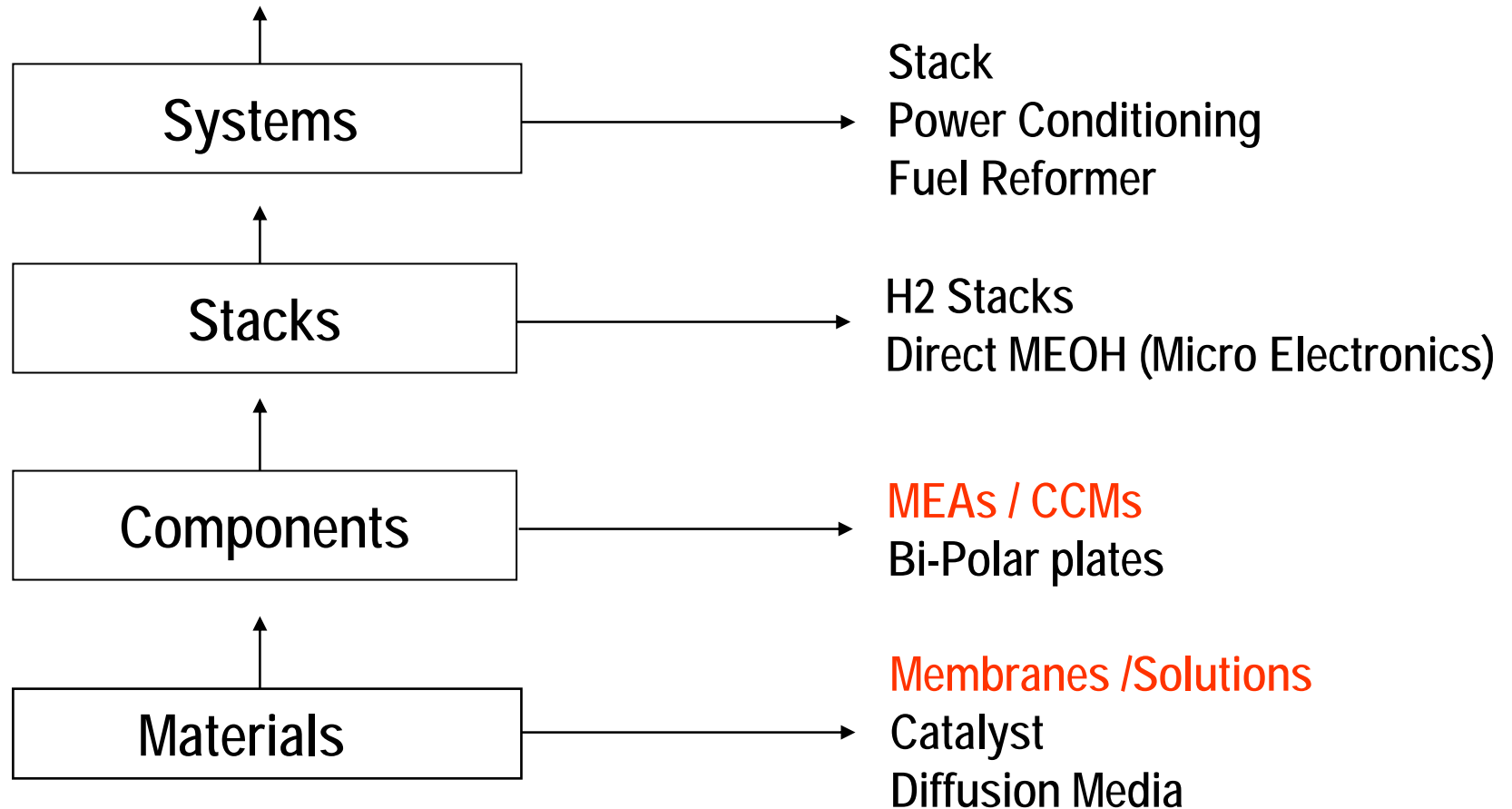


Fuel Cell Components

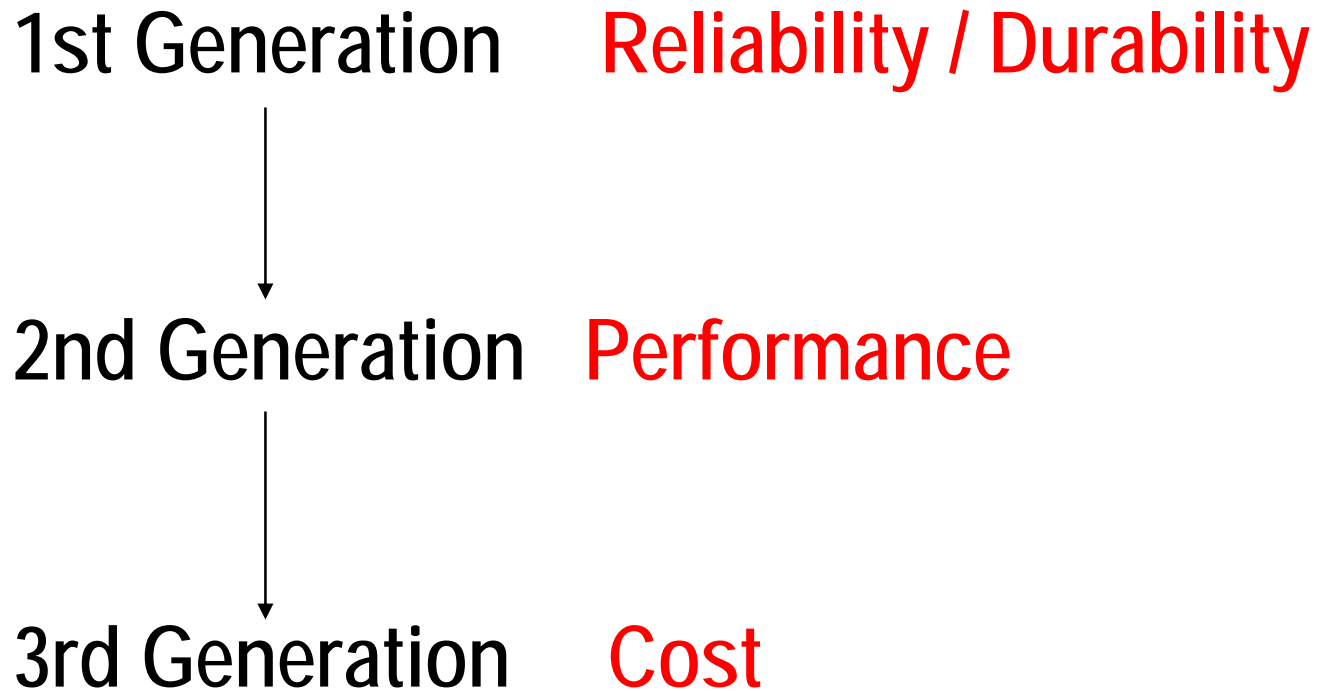


PEM Fuel Cell Industry Value Chain

End-Use Product Applications



PEM Fuel Cells Technology & Product Development



DuPont - Current Technology Focus Areas

Membrane Chemical Stability

Membrane Mechanical Durability

Catalyst Performance and Stability

Electrode Design

MEA Design

Fuel Cell Markets

Application	<u>Portable</u>	<u>Stationary</u>	<u>Transportation</u>
2015 Mkt Potential	\$1 Billion	\$5 Billion	\$ 10 Billion +
Power Range	25w - 5 kw	1 - 10,000 kw	50 - 250 kw 67 - 335 hp
Substitute Application	Battery/ICE Engine	Grid	ICE Engine
End-Market	Cell Phones, Laptops, Power Tools, Back-up Generators for telecom,	Industrial sites Commercial sites, Residential homes	Cars, buses, boats, submarines, 2-wheel bikes & scooters
Challenges	Cost, Fuel	Durability	Cost, Fuel, Performance



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