



# **Trade Sale of Nanotechnology Companies – Trends & Opportunities**

**Nanotechnology for Investors**

Zurich, September 11 2006

**Tapesh Yadav**

# Outline

**Nanotechnology – industry's perspective**

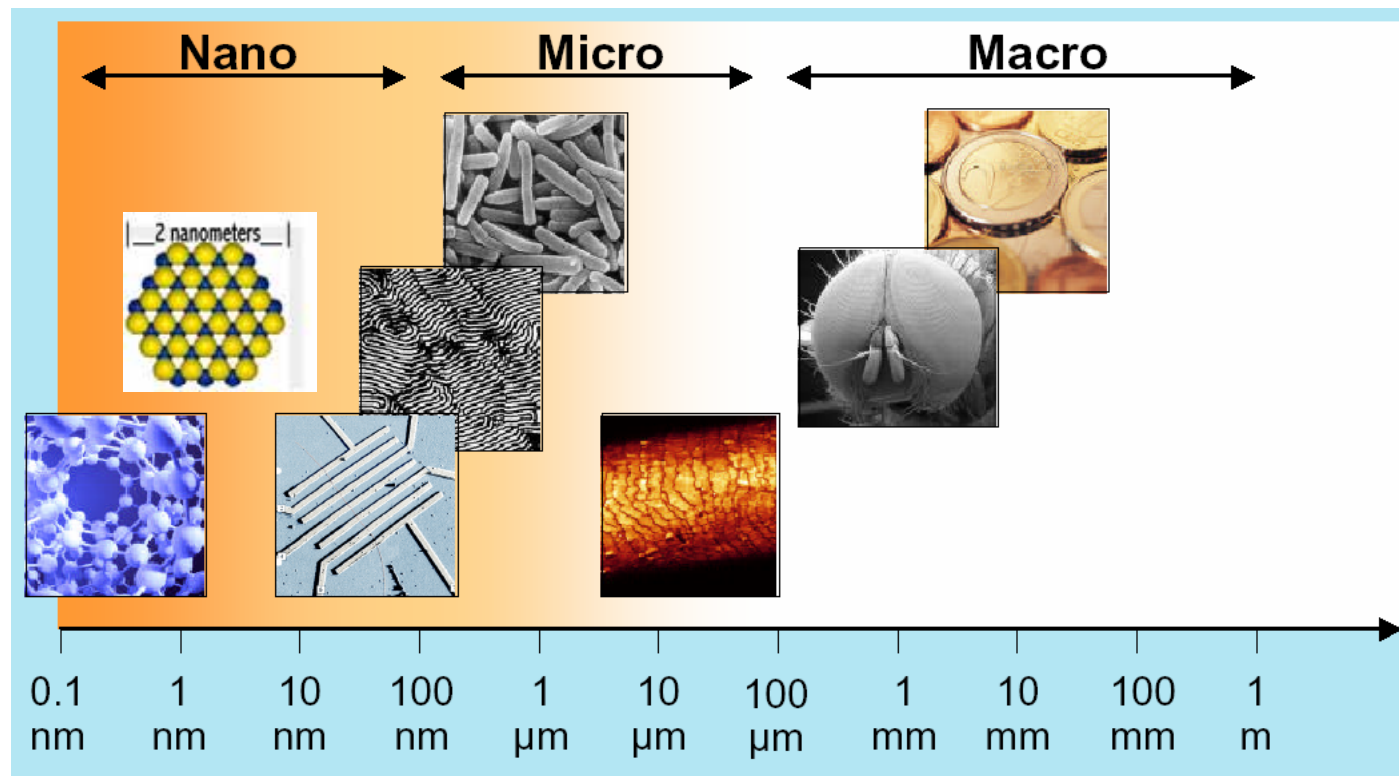
**Emerging Opportunities**

**Trade Sale – Trends & Opportunities**

**Conclusion**

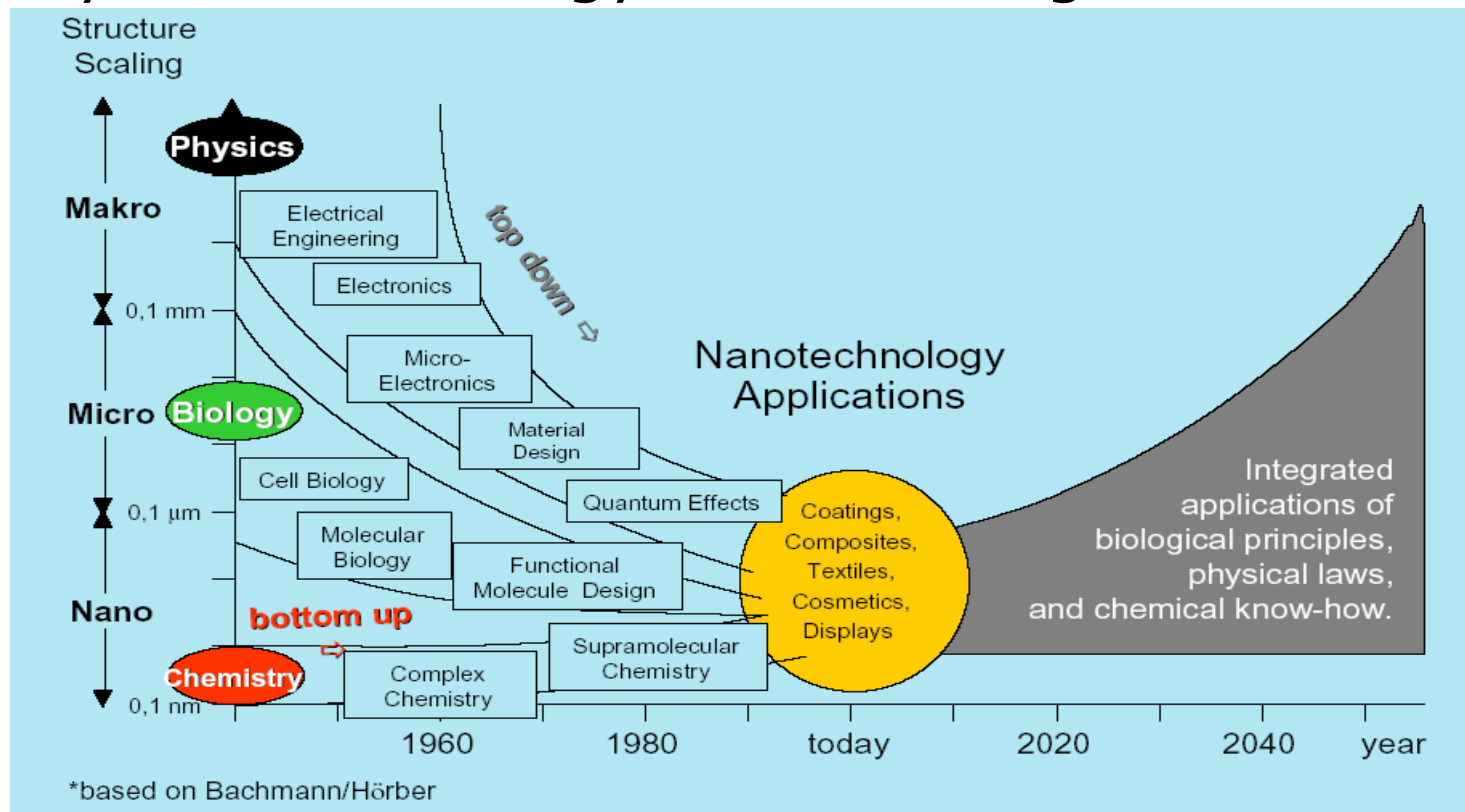
# Nanotechnology – Industry's Perspective

Why nanotechnology is interesting?



# Nanotechnology – Industry's Perspective

## Why nanotechnology is interesting?



Source: Jens Rieger, BASF Presentation

**Convergence of knowledge – novel products, new tools, sustainable solutions**

# Nanotechnology – Industry's Perspective



**Nanotechnology is one of three areas of substantial investment** [for General Electric]... potential for helping develop high-heat resistant blades for gas turbine engines, more efficient MRI contrast agents, and high-strength lightweight components for a variety of products.

- Jeffrey Immelt, General Electric

# Nanotechnology – Industry's Perspective

*Procter&Gamble*

**I expect nanotechnology to be very fruitful area**

- Alan Lafley, Proctor & Gamble

# Nanotechnology – Industry's Perspective

degussa.

**Nanotechnology will form the foundation for revolutionary discoveries** and advancements in the decades to come. It will profoundly influence the competitiveness of companies in every relevant industry.

- Herbert Riemenschneider, Degussa Corporation

# Nanotechnology – Industry's Perspective



**For BASF, nanotechnology is an area of great opportunities.** It offers us the possibility to selectively modify material properties as the basis for developing innovative and successful solutions. In the period up to 2008 BASF is investing €180 million in research and development alone [in nanotechnology cluster].

- Dr. Carolin Kranz, BASF Corporation

# Nanotechnology – Industry's Perspective



Bigger memories, quicker-loading batteries, longer-lasting and lighter materials, self-cleaning surfaces, interesting optical effects... **Nanotechnology is bringing numerous new properties to mobile equipment.**

- Tapani Ryhänen, Nokia

# Nanotechnology – Industry's Perspective

**Nanomaterials present a tremendous opportunity to introduce a host of new products** that could energize our economy, solve major societal problems, revitalize existing industries, and create entirely new businesses.

- Nanotechnology Roadmap, Chemical Vision 2020



# Presentation Progress

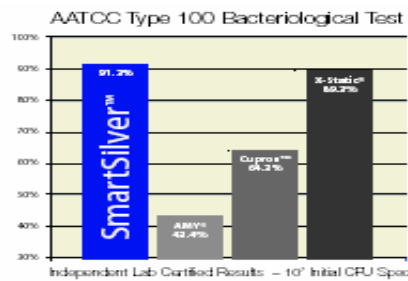
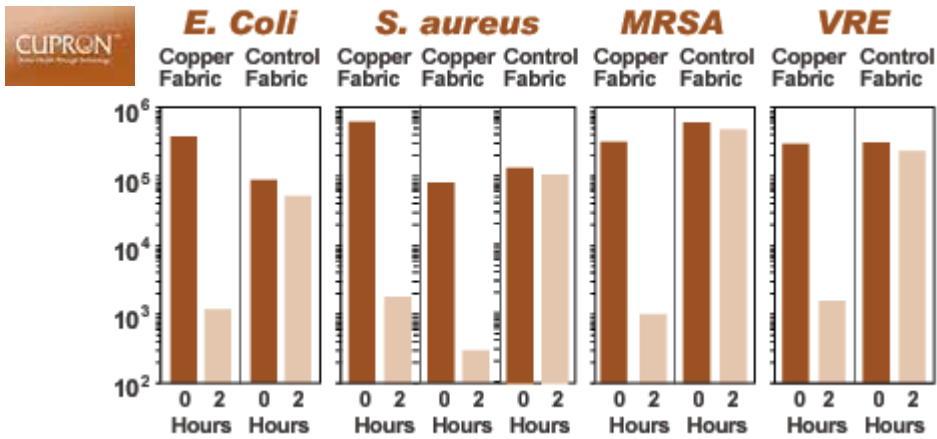
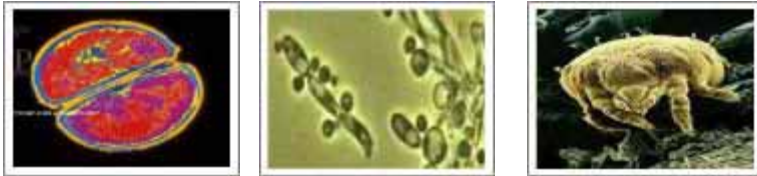
Industry has strong enthusiasm for nanotechnology

**Emerging Opportunities**

Trade Sale – Trends & Opportunities

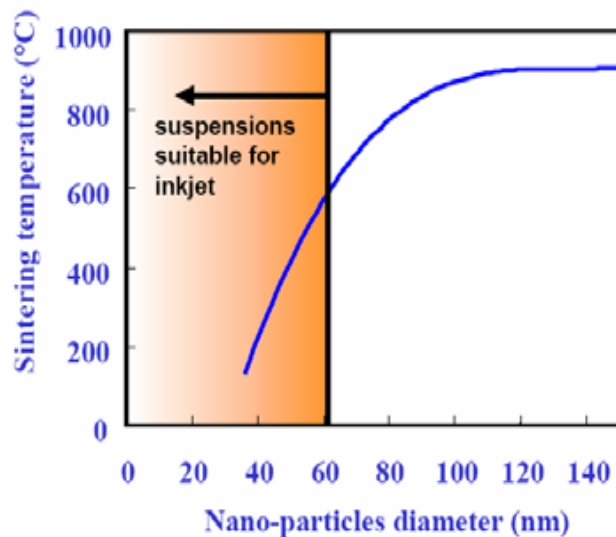
Conclusion

# Emerging Opportunities: Life Sciences - Disease Prevention



**Financial Impact: \$25+ billion/year**

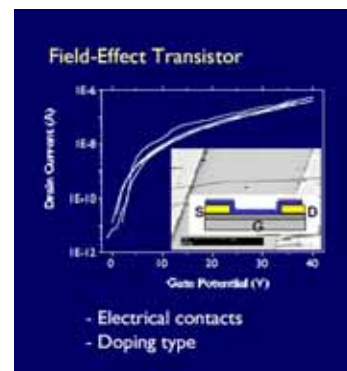
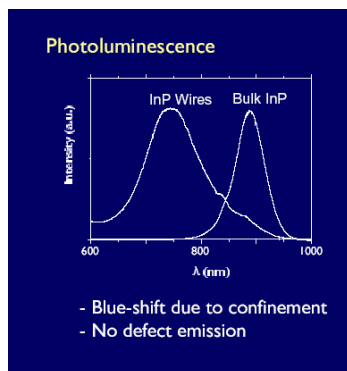
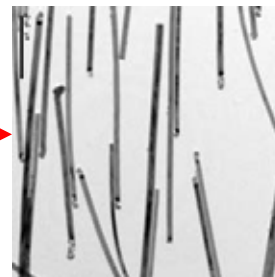
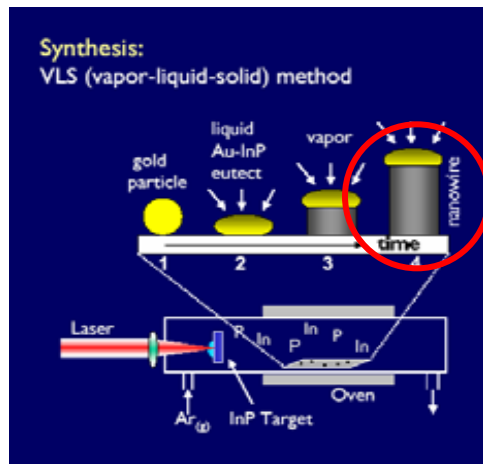
# Emerging Opportunities: Printable Electronics



Source: Cabot Corporation, USA

**Financial Impact: \$10+ billion/year**

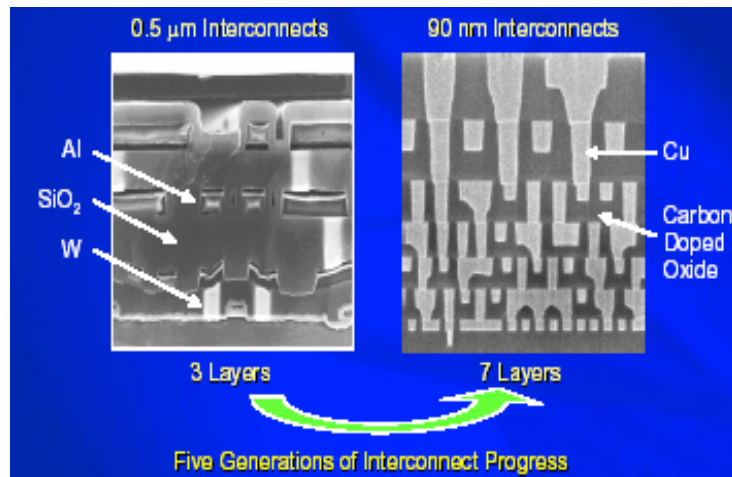
# Emerging Opportunities: NanoLEDs Electronics



Source: Philips, The Netherlands

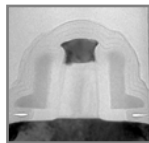
**Financial Impact: \$10+ billion/year**

# Emerging Opportunities: Manufacturing Process Innovation

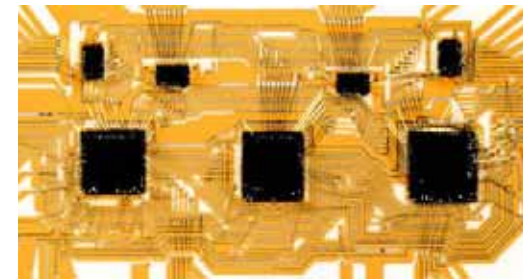
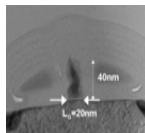


Source: Jack Uppal, Intel Corporation, USA

90nm Node  
2003



45nm Node  
2008



**Financial Impact: \$1+ billion/year**

# Emerging Opportunities: Manufacturing Process Innovation



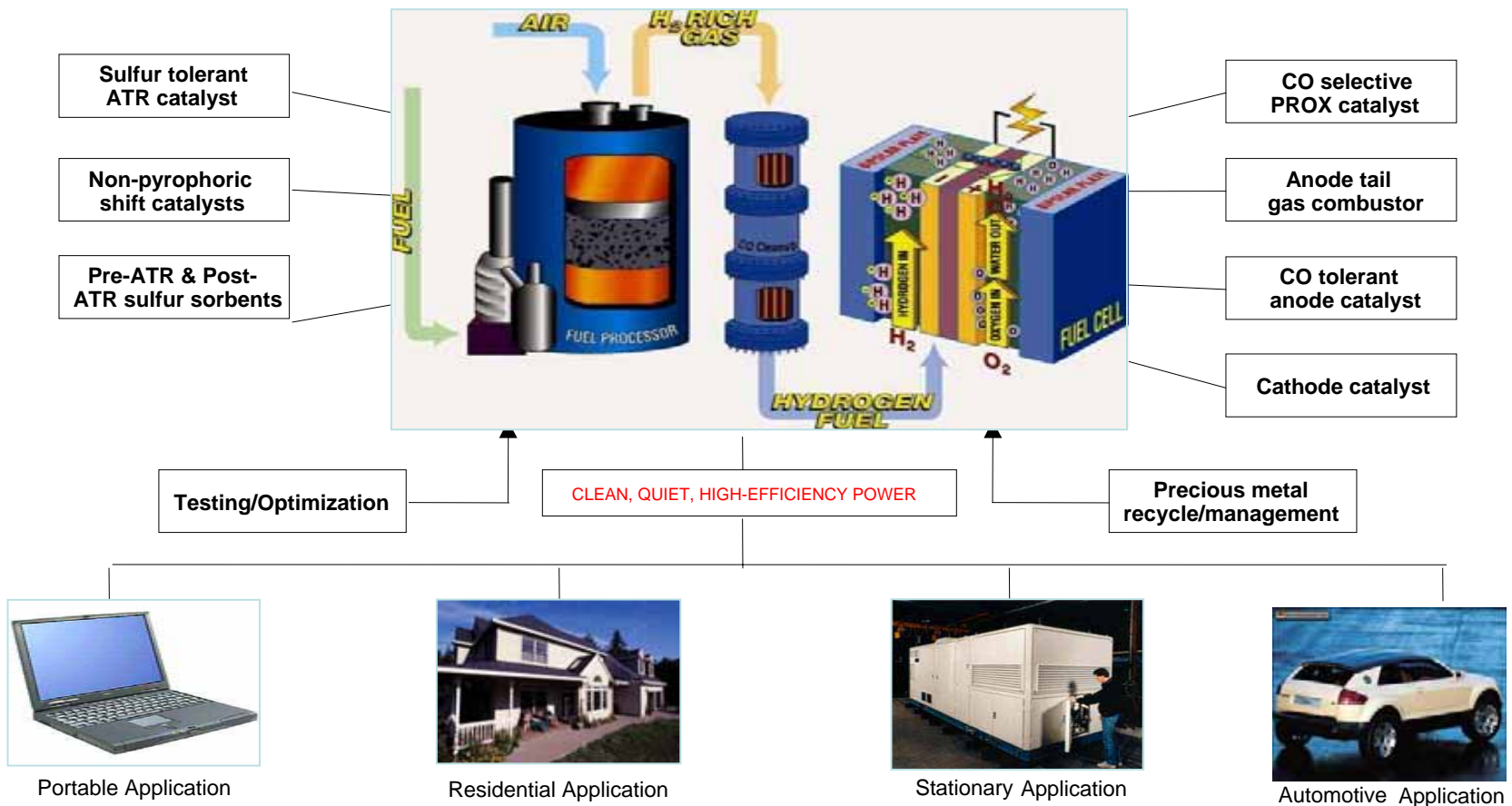
Antenna

Active

Active RF Labels

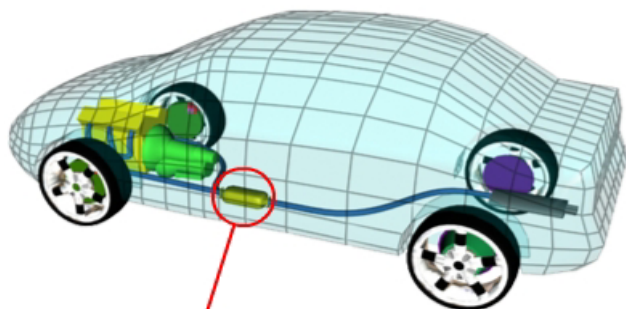
Financial Impact: \$20+ billion/year

# Emerging Opportunities: Sustainable Energy



**Financial Impact: \$25+ billion/year**

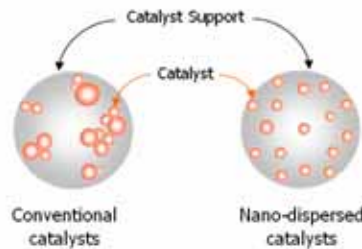
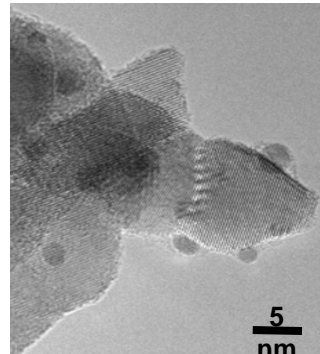
# Emerging Opportunities: Cleantech



**Catalytic Converter**

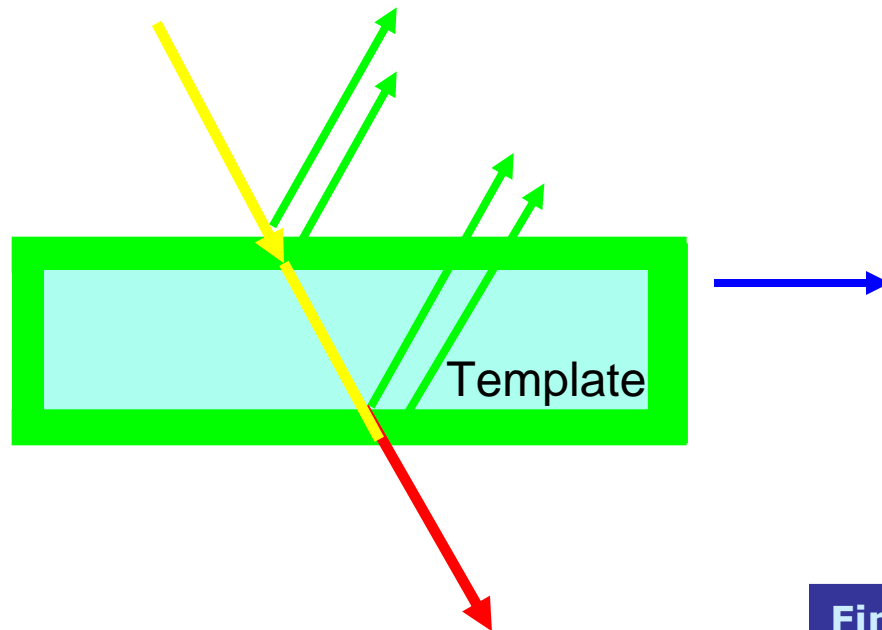
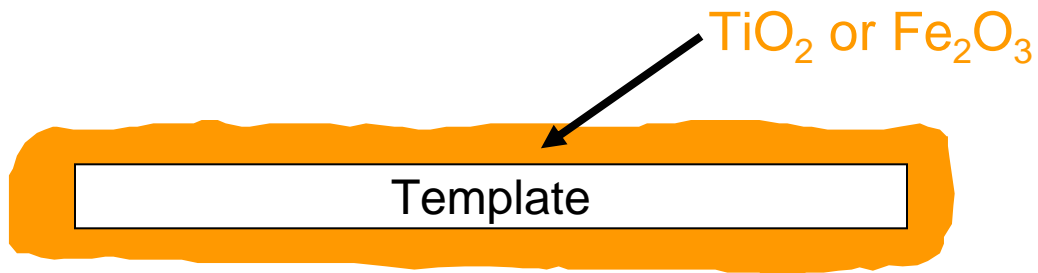


**Supported  
Metal  
Catalyst**



**Financial Impact: \$10+ billion/year**

# Emerging Opportunities: Luxury Products



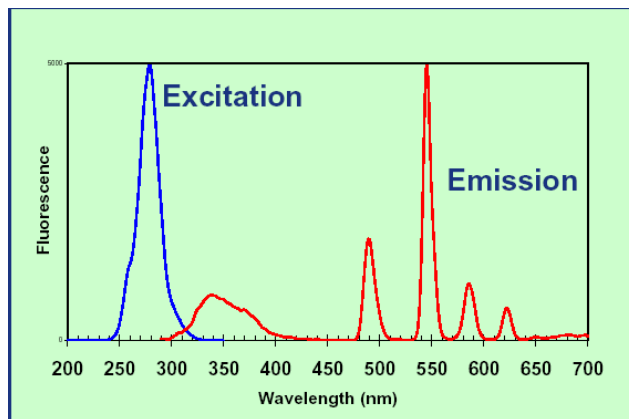
**Financial Impact: \$500+ million/year**

# Emerging Opportunities: Luxury Products

## Brand Authenticity

■ Host lattice elements  
■ Activator and emitter elements

H																	He	
Li	Be											B	C	N	O	F	Ne	
Na	Mg											Al	Si	P	S	Cl	Ar	
K	Ca	Sc	Ti	V	Cr	Mn	Fe	Co	Ni	Cu	Zn	Ga	Ge	As	Se	Br	Kr	
Rb	Sr	Y	Zr	Nb	Mo	Tc	Ru	Rh	Pd	Ag	Cd	In	Sn	Sb	Te	I	Xe	
Cs	Ba	La	Hf	Ta	W	Re	Os	Ir	Pt	Au	Hg	Tl	Pb	Bi	Po	At	Rn	
Fr	Ra	Ac																
			Ce	Pr	Nd	Pm	Sm	Eu	Gd	Tb	Dy	Ho	Er	Tm	Yb	Lu		
			Th	Pa	U	Np	Pu	Am	Cm	Bk	Cf	Es	Fm	Md	No	Lr		



Financial Impact: \$5+ billion/year

# Presentation Progress

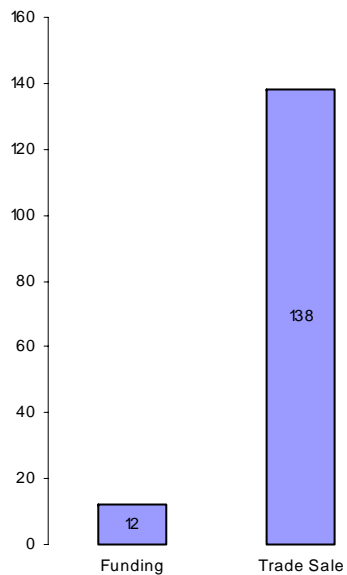
Industry has strong enthusiasm for nanotechnology

Emerging Opportunities are of high value

**Trade Sale – Trends & Opportunities**

Conclusion

# Trade Sale Case Studies: NanoSystems

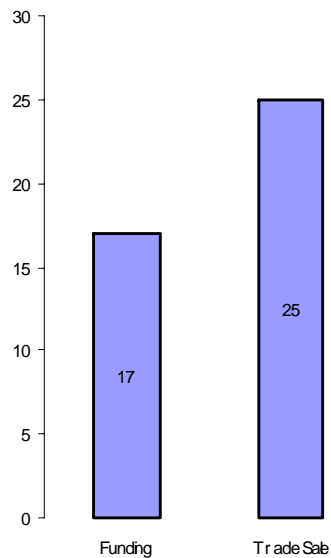


**Investment & Exit, \$ MM**



**Drug Delivery  
(Solubilize drugs)**

# Trade Sale Case Studies: Arryx Inc.

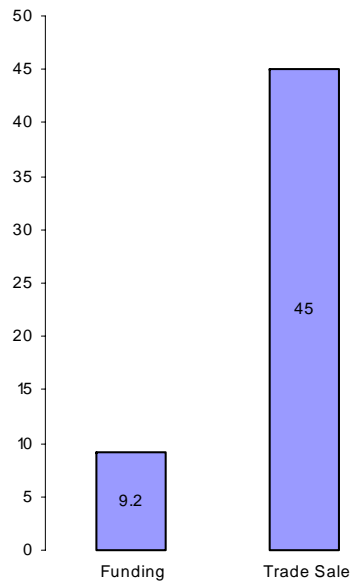


Investment & Exit, \$ MM

HAEMONETICS®

Blood processing technology  
for life science applications

# Trade Sale Case Studies: NanoGram Devices



**Investment & Exit, \$ MM**



**Energy Devices for life  
science applications**

# Trade Sale Case Studies: NanoProducts

- Manufacture & sell nanomaterials
- 90+ patents
- Attracted 10+ MM in corporate investments
- Key customers
  
- Round-the-clock, ISO 9001 certified operations
- Expansion capital necessary
  
- Considered IPO, Trade Sale
- Five trade sale offers
- Transaction completed in January 2006



**KOCH INDUSTRIES, INC.**

**Building blocks of  
nanotechnology**

# Trade Sale of VC funded company

## What facilitates company's exit?

- Distinctive product
- Innovation that threatens status-quo
- Capability that creates new markets
- Customers enthusiastic
  
- World-class quality
- Audited, cGMP, Responsible care
- A team that will provide continuity
- Strong financials
  
- Strong competitive acquirers

# Trade Sale Prospects

<b>Nanotech Application</b>	<b>Emerging Opportunities</b>	<b>Possible Acquirers</b>	<b>3 to 7 year M&amp;A Opportunity</b>
<b>Life Sciences</b>	<b>Bioimpants, Devices, Disease prevention, Drug Delivery, Consumer products, Pharma, Diagnostics</b>	<b>Zimmer, Medtronic, Boston Scientific, J&amp;J, 3M, Smith &amp; Nephew, Pfizer, Merck, Astra Zeneca, Novartis, Roche, etc.</b>	<b>\$ 5 – 15 billions</b>
<b>Electronics</b>	<b>Chips, Photonics, Displays, Sensors, Non-volatile Memory, Embedded electronics, RFID, LEDs, Flexible Electronics</b>	<b>Intel, AMD, HP, IBM, TI, Hitachi, Sharp, Samsung, Motorola, Nokia, Siemens, Philips, Sony, SanDisk, Cisco, Alcatel, etc.</b>	<b>\$ 1 – 10 billions</b>
<b>Energy</b>	<b>Fuel Cells, Catalysts, Batteries, Supercap, Photovoltaics</b>	<b>BP, ChevronTexaco, ExxonMobil, Shell, Total, Sony, Sanyo, etc.</b>	<b>\$ 0.5 – 5 billions</b>
<b>Others</b>	<b>Authenticate, Consumer products, Coatings, Composites, Textiles</b>	<b>P&amp;G, Unilever, DuPont, Dow, PPG, Akzo Nobel, Bayer, BASF, Degussa, R&amp;H, Altana, GE, etc.</b>	<b>\$ 1 – 10 billions</b>

# Conclusion

**Industry has strong enthusiasm for nanotech**

**Emerging Opportunities are of high value**

**Trade sales have begun in nanotech**

**Properly nurtured companies can provide exit**

**Thank you.**



A graduate of the Massachusetts Institute of Technology, Tapesh is a successful serial entrepreneur with over 15 years of nanotechnology experience. In 2005, he was named as the world's most prolific inventor in nanotechnology. He has founded, built and sold successful, world-class quality companies with nanotechnology products. NanoProducts – a company that he nurtured as Chairman & CEO – attracted multiple acquisition and investment interests from some of the world's largest and most successful companies. Tapesh presently lives part time in Colorado, USA and part time in Zurich, Switzerland. He is currently Venture Partner with NanoDimension Management Ltd.