

CleanTech at Michigan: Technology Scope



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University of Michigan College of Engineering

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FOR ENTREPRENEURIAL STUDIES



What is Today's Objective?

1. To introduce the breadth and depth of research and technology within CleanTech at Michigan
2. To introduce current and future business opportunities in the CleanTech space
3. To engage investors in the development of a UM CleanTech pipeline for entrepreneurial opportunity





Context for CleanTech Conference

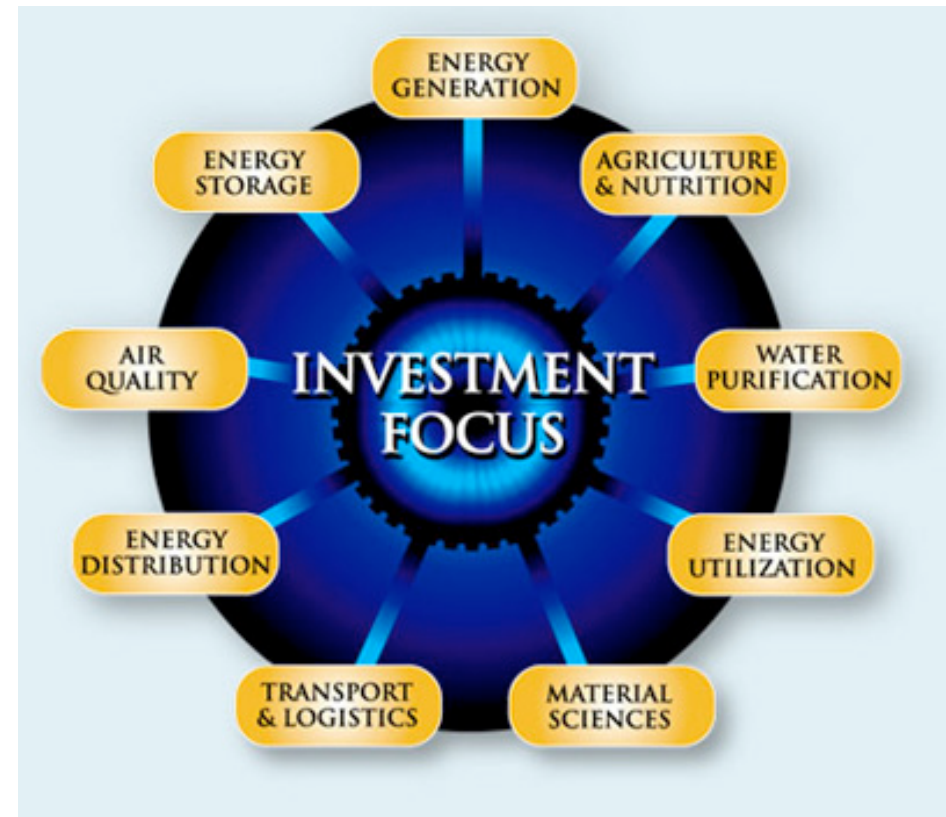
1. How does CleanTech at UM map against investment sectors in this space?
2. How is the Michigan Memorial Phoenix Energy Institute positioned to facilitate a technology pipeline in this space?
3. What are representative business opportunities at UM in CleanTech sectors?
 - Energy storage and generation
 - Smart grids
 - Clean manufacturing
 - Green buildings
4. What are the investment trends in CleanTech, and how can Michigan position itself in this space?



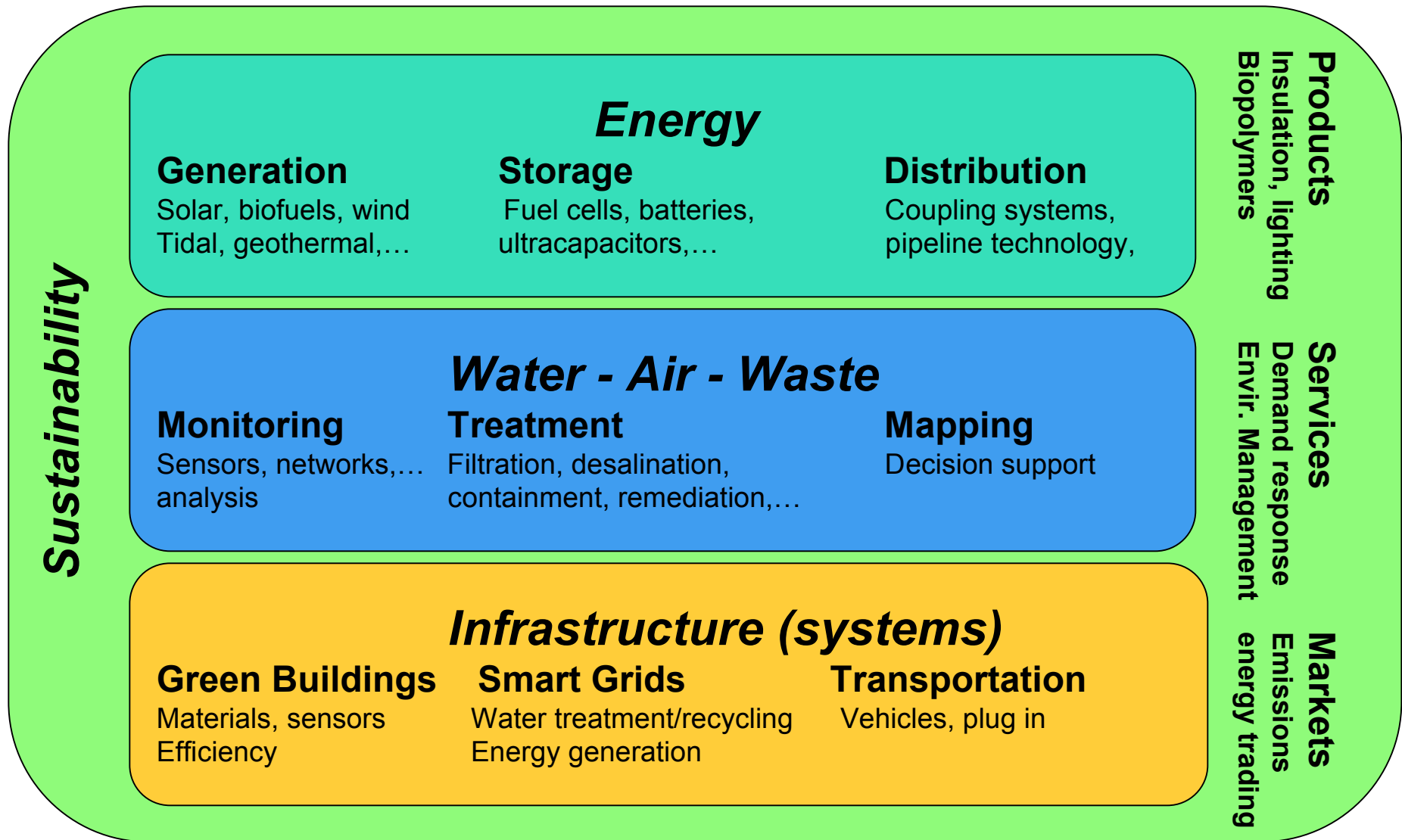
What is CleanTech?

Innovative technologies specifically designed to:

1. Optimize the use of natural resources and reduce environmental impact
2. Cut or eliminate pollution and toxic wastes
3. Deliver equal or superior performance compared with conventional offerings
4. Provide investors, companies and customers with the promise of increased returns, reduced costs and lower prices



Technology Segmentation



Strategic Opportunity Drivers



1. Cost of scaling going down - fossil fuel costs going up
2. Influx of private capital
3. Governments compete to build regional economies and develop high-paying jobs
4. Shift of regulatory and financial support to more efficient technologies
5. Explosive demand for energy and water infrastructure in China, India, and other developing nations
6. Consumer demand for cleaner products and services
7. Certainty of climate change drives business innovation





*GreenTech could be the largest economic opportunity of the 21st century
(John Doerr, Kleiner, Perkins, Caufield & Byers)*

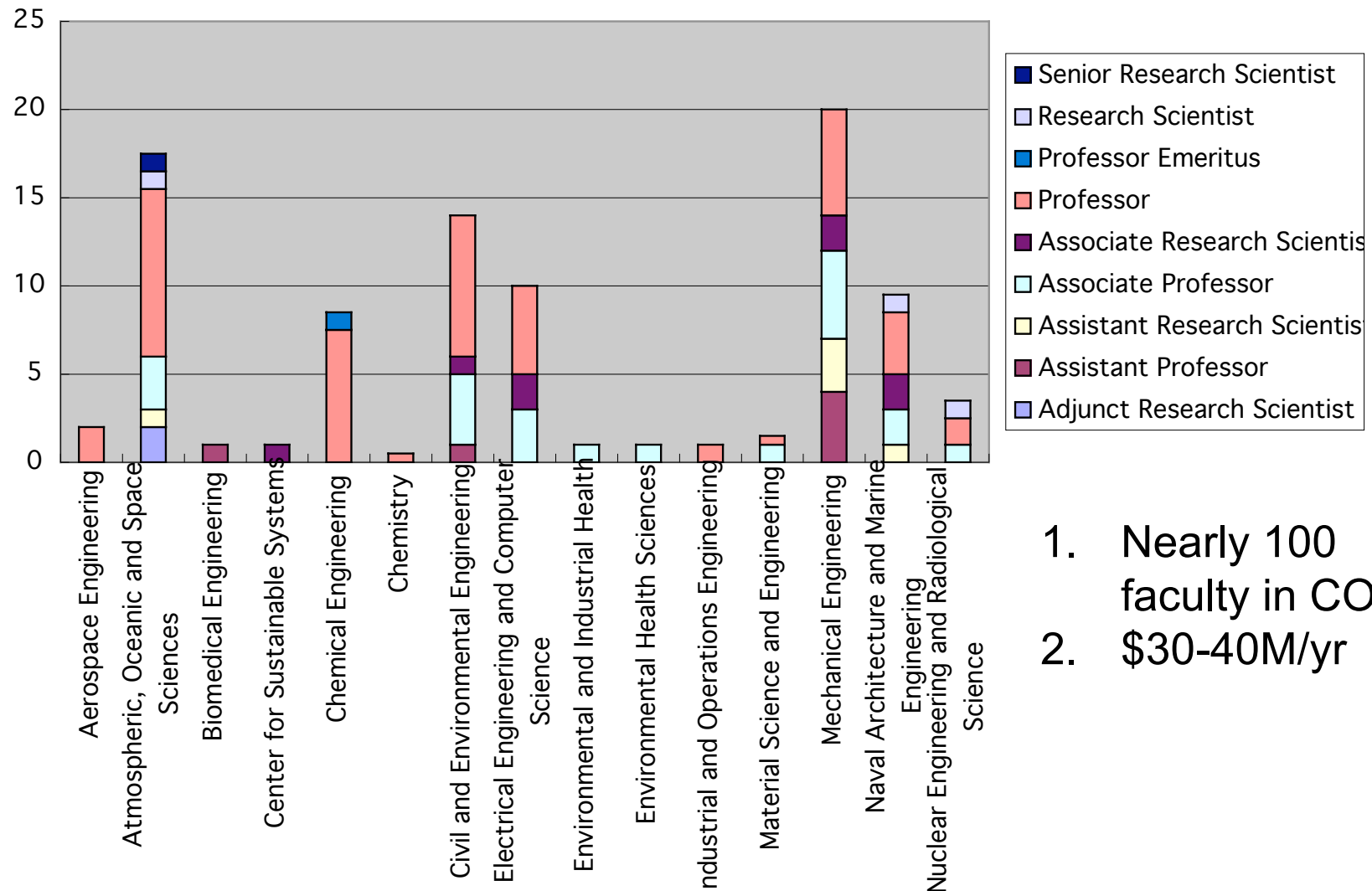




CleanTech by Numbers

1. Startups: 1,500 (global); **1,020** in the US
energy (930), air (45), water (90), waste management (120), sustainability (315)
2. VC funding: **23%** (mostly in US)
3. IPOs (2006): **30 (\$4.4 bn.)**:
mostly energy
4. M&A (2006): **59 (\$4.2 bn.)**:
energy (43%), waste (32%), water (17%), sustainability (8%), and air (1%)
5. Patents in CleanTech: **>4,000**

CleanTech Faculty at UM



1. Nearly 100 faculty in COE
2. \$30-40M/yr

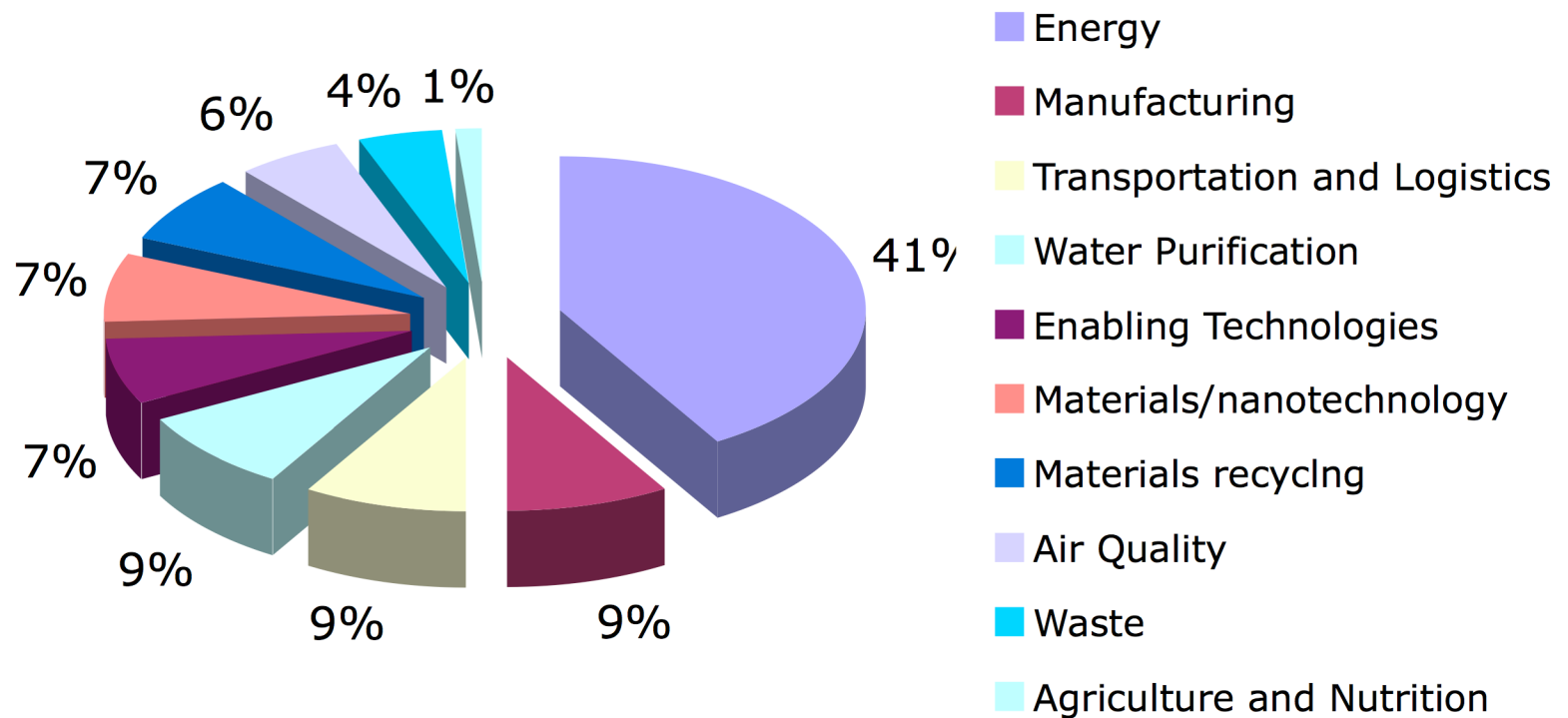
CleanTech Sectors at UM



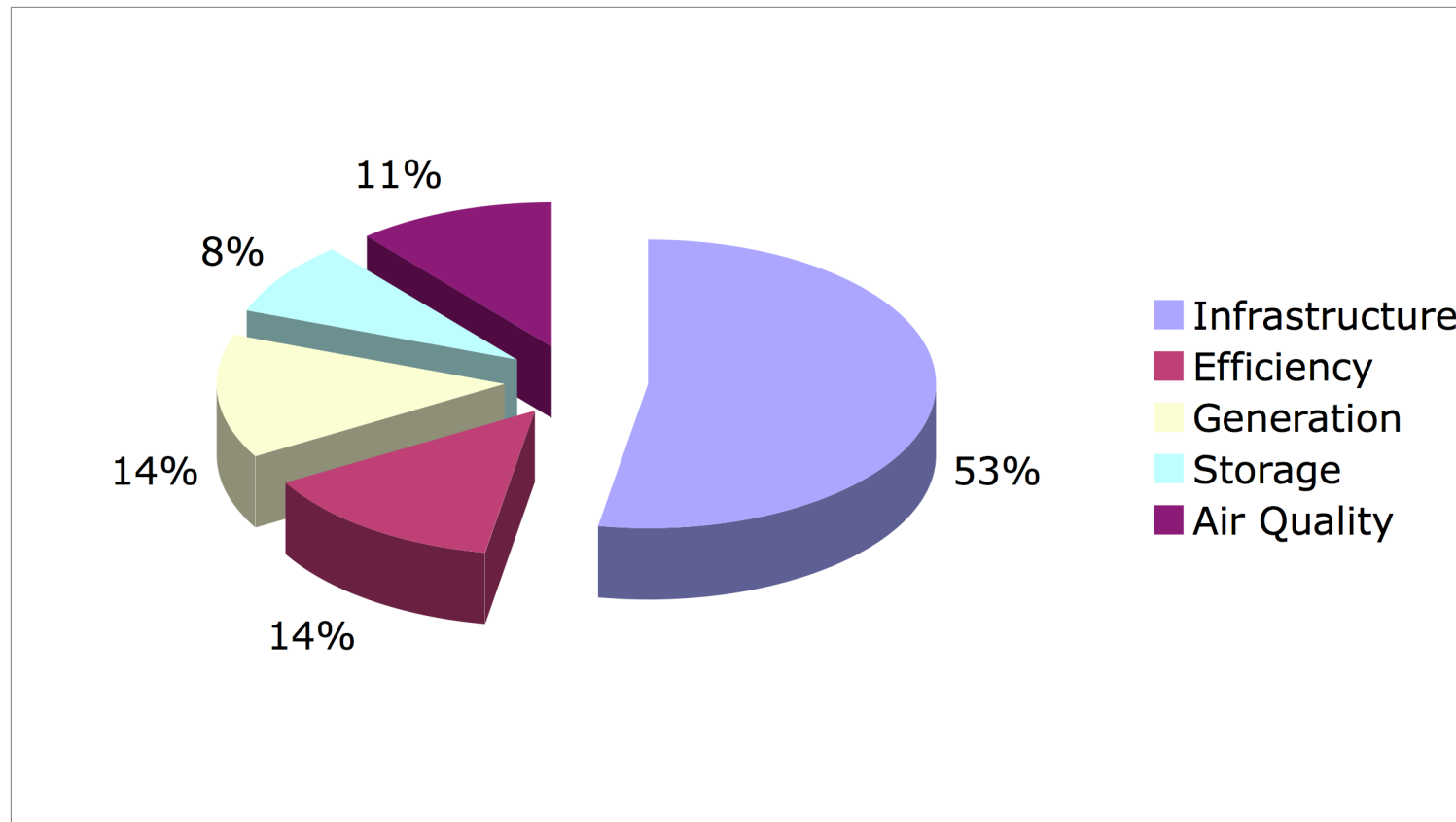
Catalysis for Innovations
Research themes
Curriculum development
Industrial interactions



Research foci - CleanTech Segmentation



Research Foci - Energy Sector Segmentation





Technology Access (out of 116)

