



U.S. Department of Energy  
Energy Efficiency and Renewable Energy

## DOE Clean & Sustainable Energy Programs

James Quinn  
Industrial Technologies Program  
Office of Energy Efficiency and Renewable Energy  
U.S. Department of Energy  
October 2007



**Save  
ENERGY  
Now**



U.S. Department of Energy  
Energy Efficiency and Renewable Energy  
Bringing you a prosperous future where energy is clean, abundant, reliable, and affordable

### Basic Energy Sciences



**Materials Sciences and Engineering**



**Chemical Sciences, Geosciences, Biosciences**



**Scientific User Facilities**

[www.sc.doe.gov/bes/](http://www.sc.doe.gov/bes/)

### Fossil Energy

#### **Carbon Sequestration**

Developing technologies to capture and permanently store greenhouse gases.

**FutureGen Initiative:** Billion-dollar project to build first coal-fueled prototype power plant to incorporate carbon sequestration technologies.

<http://fossil.energy.gov/sequestration/>



## Advanced Energy Initiative

- **Changing the way we fuel our vehicles:** Expand fuels from biomass and develop fuel cells that use hydrogen from domestic feedstocks
- **Changing the way we power our homes and businesses:** Generate more electricity from clean coal, advanced nuclear power, and renewable resources (biofuels, wind power, solar power, and hydrogen and fuel cells)

### Wind:

Goal : Derive 20% of electric power from wind.

### Solar:

Goal: Make solar energy cost-competitive with conventional forms of electricity by 2015.



## Biofuels

**Goal:** Reduce U.S. gasoline consumption by 20% over the next 10 years

**Benefits:** When produced from renewables, cellulosic ethanol emits 86% less GHG than reformulated gasoline

- Advanced R&D on biochemical and thermochemical conversion pathways
- Cost-shared development of six integrated biorefineries across the nation.
- Two new Bioenergy Research Centers



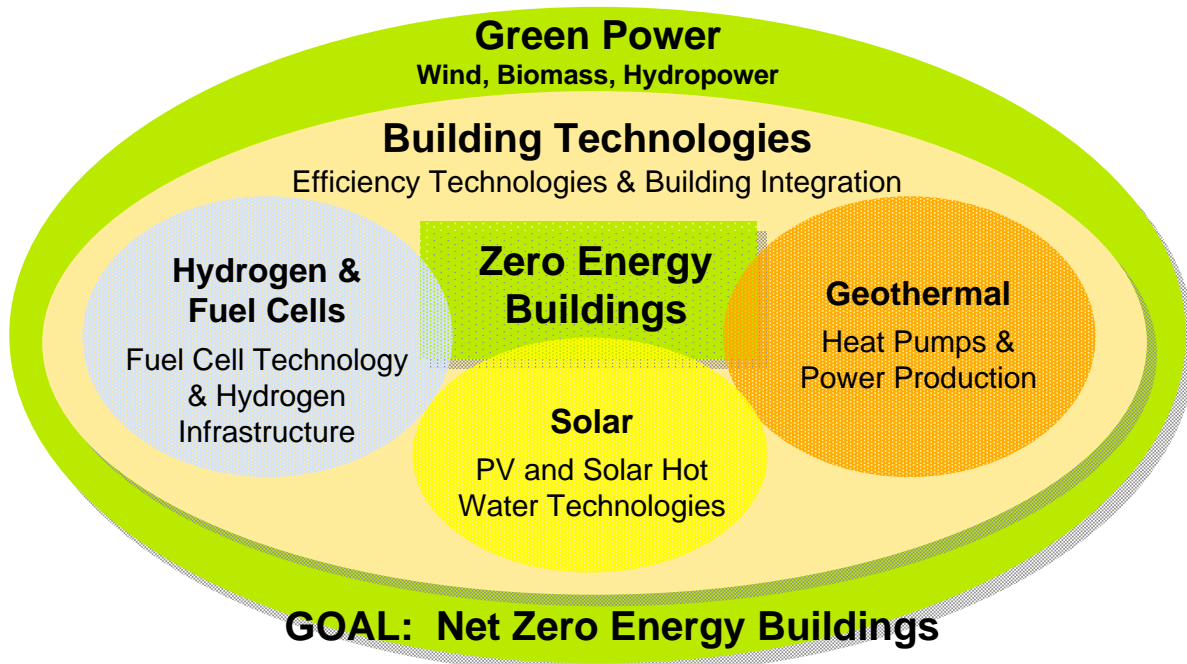


## Commercial Buildings

- **Solid State Lighting**
- **Next-Generation Windows**
- **Building Energy Codes**
- **EnergyPLUS**



## Buildings: Platform for Integration





# Industrial Technologies: Save Energy Now

Major initiative to reduce industry's energy intensity 25% by 2016



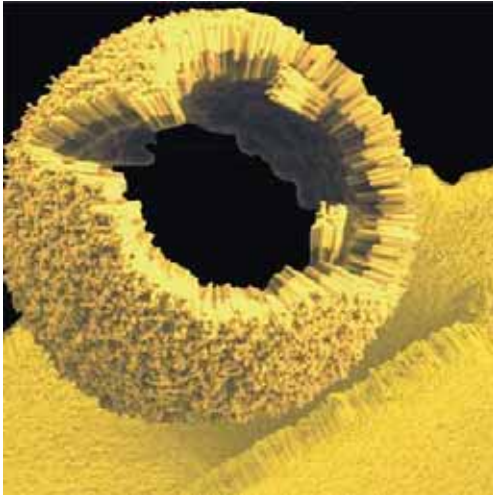
## Save Energy Now Plant Assessments 2006-2007

- Results of 294 assessments of large plants completed
- Identified energy savings: 65 TBtu/\$630 million
- Total potential carbon dioxide (CO<sub>2</sub>) emissions reduction: 4.8 million metric tons
- Follow-ups show about 60-70% of savings being implemented



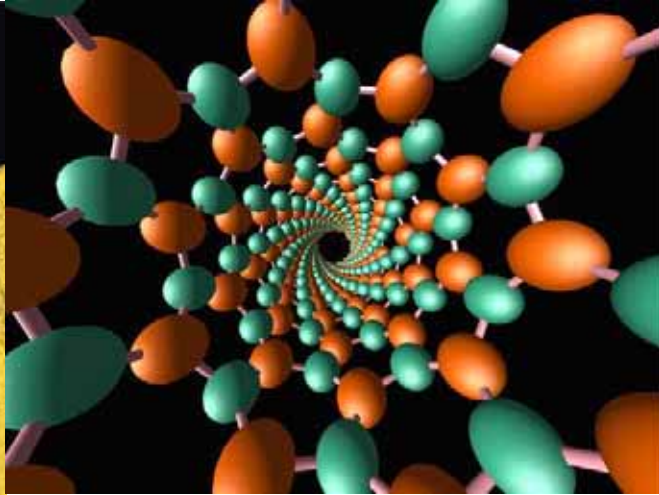


## Nanotechnology for Industry



The self-assembly of polymer nanorods results in a curved structure.

Credit: Chad Mirkin, Northwestern University



View down middle of a boron nitride nanotube.

Credit: © Vin Crespi, Penn State Physics. Distributed under the Creative Commons license

