



INFRASTRUCTURE SECTOR - FACILITIES

Overview



- Progress
- Efficiencies
 - ▣ Technical Efficiency
 - ▣ Systematic Efficiency
 - ▣ Integrated Efficiency
- Next Steps



Progress



- Crisis of Credit
- Geography of a Recession
- Road to Recovery
- Benchmarking Recovery Approaches
 - ▣ Japan, Sweden
- Land Use
 - ▣ Vacancy Rates
 - ▣ Current Trends
 - ▣ Options
- Efficiencies



Benchmarking Follow Up



Household Debt to GDP Ratio

Country	Years	Debt to GDP Ratio
Japan	1991	125%
	1995	95%
US	2007	133%
	2009	130%



Land Use – Vacancy Rates



Residential Vacancy

Number	Vacancy Rates	Total Square Footage
19 million (130 million)	14% (67.3% home ownership)	42.2 billion (median footage: 2,219)



Commercial Vacancy

Category	Vacancy Rates	Total Square Footage
Industrial	9.6%	12.4 billion
Office	14.7%	1.6 billion
Retail	10.2%	2.6 billion
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	TOTAL	58.8 billion



SOURCE: United States Census Bureau Report on Homeownership and Vacancy (as of April 27, 2009; Colliers North American Industrial, Office, and Retail Real Estate Q12009 Highlights (as of March 31, 2009)

Land Options – Current Trends



□ Current Trends

- Used as Temporary Shelters
- Consumed in Fires
- Turned into Squatter Locations
- Demolished
- Reclaimed in Distressed Neighborhoods



Land Options - Approaches



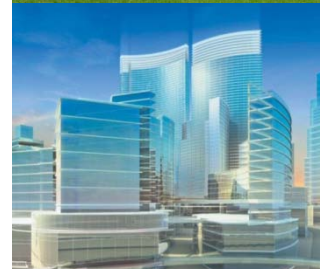
- Land Use Options for Vacant, Foreclosed Land :
 - ▣ Remain Public
 - ▣ Sale to Private
 - ▣ Bank the Land
 - ▣ Do nothing...



Efficiencies – A Framework for Innovation



- **Technical Efficiency**
 - ▣ Efficiency based on the individual components of an infrastructure sector
 - Example: installing no flow/low-flow toilets
- **Systematic Efficiency**
 - ▣ Efficiency based on the entire infrastructure sector
 - Example: determining appropriate energy mixes
- **Integrated Efficiency**
 - ▣ Efficiency based on the synergies found between infrastructure sectors
 - Example: developing decentralized power and water systems



Efficiencies - Technical



□ ENERGY STAR (1992)

- Joint program of the U.S. EPA and U.S. DOE
- Certification: Ensures product meets strict energy efficiency guidelines



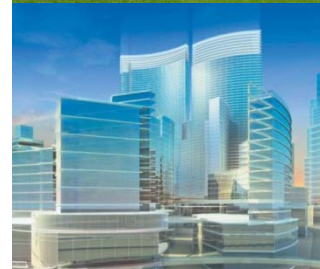
□ WaterSense® (2006)

- Program of the U.S. EPA
- Goal: To encourage water efficiency by encouraging use of specially labeled consumer products



□ Forest Stewardship Council (1993)

- Intergovernmental organization headquartered in Germany
- Certification: Ensures that the most current standards of sustainable forestry are being used in the production of the consumer product.

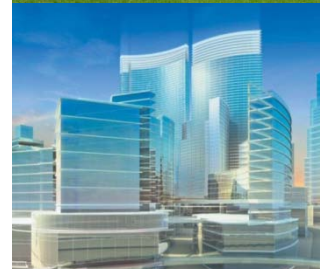


Efficiencies - Technical



□ LEED (1998)

- Leadership in Energy and Environmental Design
- A green building rating system
- Developed by the U.S. Green Building Council (USGBC)



□ EarthCraft House™ (1999)

- Joint program of the Greater Atlanta Home Builders Association and Southface Energy Institute
- Partnered with ENERGYSTAR
- Goal: To educate on resource and energy-efficient construction



Efficiencies - Systematic



- Systematic Efficiency
 - ▣ Mixed-Use Development



- ▣ Livable Centers/Communities Initiatives



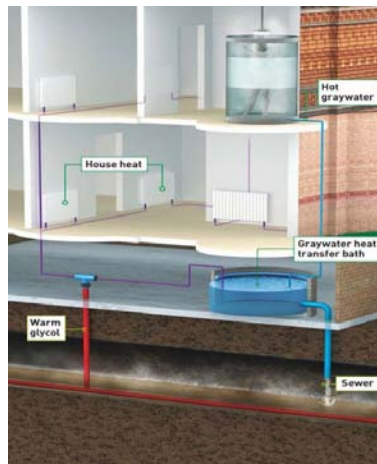
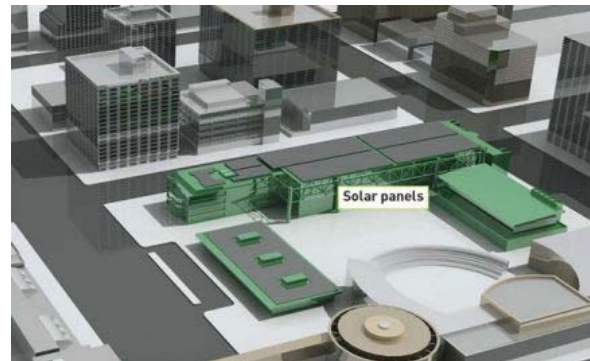
Efficiencies - Integrated



□ Integrated Efficiency

▣ Integrated City/ Development Planning

Case Study: Turn unused roof space into power supply



Case Study:
Use wastewater to heat homes



Efficiencies – Facilities



- Technical Efficiency
 - ▣ ENERGY STAR, WaterSense[®], EarthCraft Homes[™], Forest Stewardship Council, LEED
- Systematic Efficiency
 - ▣ Mixed-Use Development, Livable Centers/Communities Initiatives
- Integrated Efficiency
 - ▣ Integrated City/Integrated Developing Planning



Home Energy Use Consumption



	Consumption*	Expenditures*
Total U.S. Residential	10.55 Quadrillion Btu	\$201.07 Billion
Per Household	94.9 Million Btu	\$1,810
Per Household Member	37.0 Million Btu	\$705
Per Square Foot	43.7 Thousand Btu	\$0.83

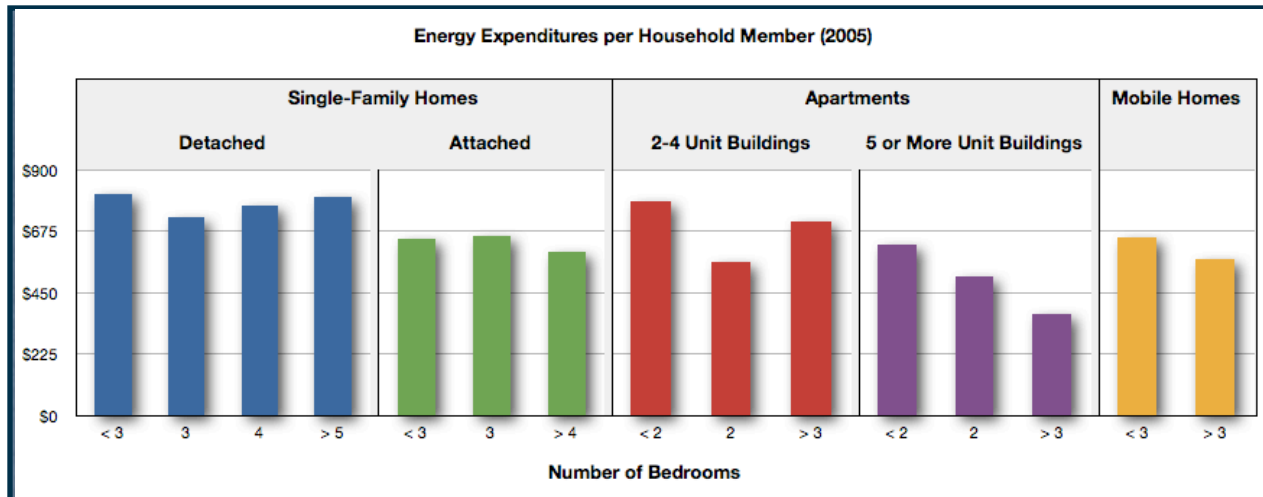


SOURCE: 2005 Residential Energy Consumption Survey conducted by the Energy Information Administration (http://www.eia.goe.gov/emeu/recs/recs2005/c&e/detailed_tables2005c&e.html)

Energy Expenditures by Type of Housing Unit



Type of Home		% of Population
Homes	Detached	68.9%
	Attached	6.6%
Apartments	2 to 4 Unit Building	6.6%
	5 or More Unit Building	11.9%
Mobile Homes		6.0%

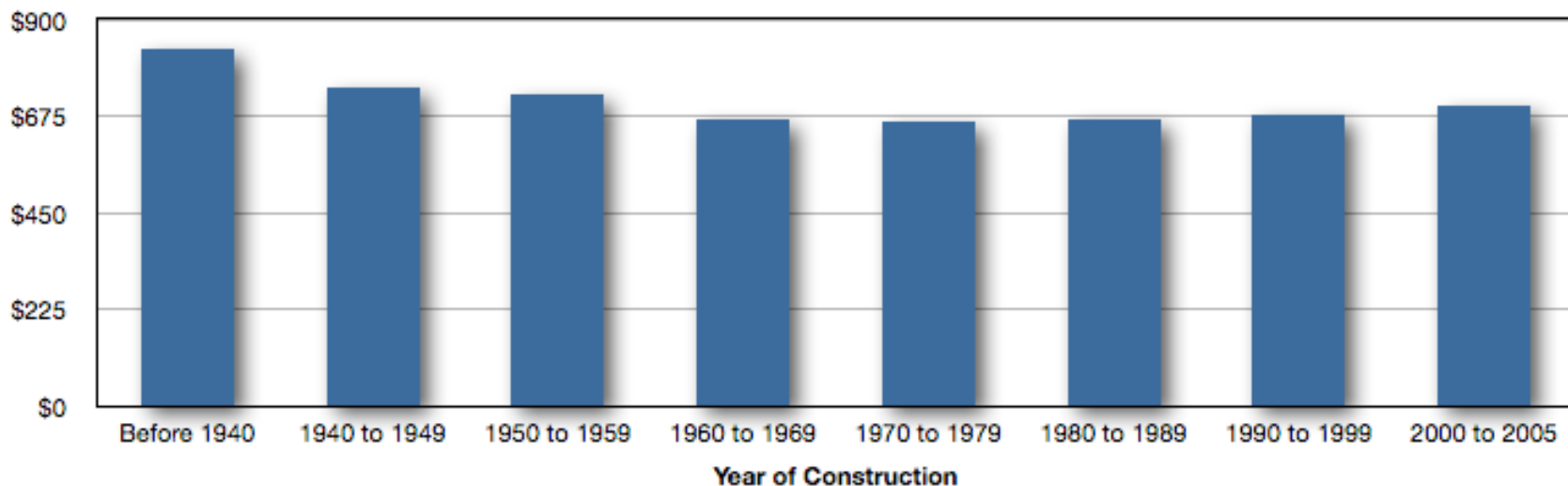


SOURCE: 2005 Residential Energy Consumption Survey conducted by the Energy Information Administration (http://www.eia.gov/emeu/recs/recs2005/c&e/detailed_tables2005c&e.html)

Energy Expenditures by Year of Construction



Energy Expenditures per Household Member



SOURCE: 2005 Residential Energy Consumption Survey conducted by the Energy Information Administration (http://www.eia.gov/emeu/recs/recs2005/c&e/detailed_tables2005c&e.html)