



ARCHITECTURE
PLANNING
DESIGN

Creating a Culture of Sustainability Buildings, Neighborhoods & Regions

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Defining Sustainability?

1. Holistic/Integrated Design Approach

2. Sustainable Site Design

3. Water Efficiency

4. Energy & Atmosphere Conservation

5. Materials & Resource Conservation

6. Indoor Environmental Quality

7. Regional Design

8. Measurable Performance



The Pursuit of True Sustainability

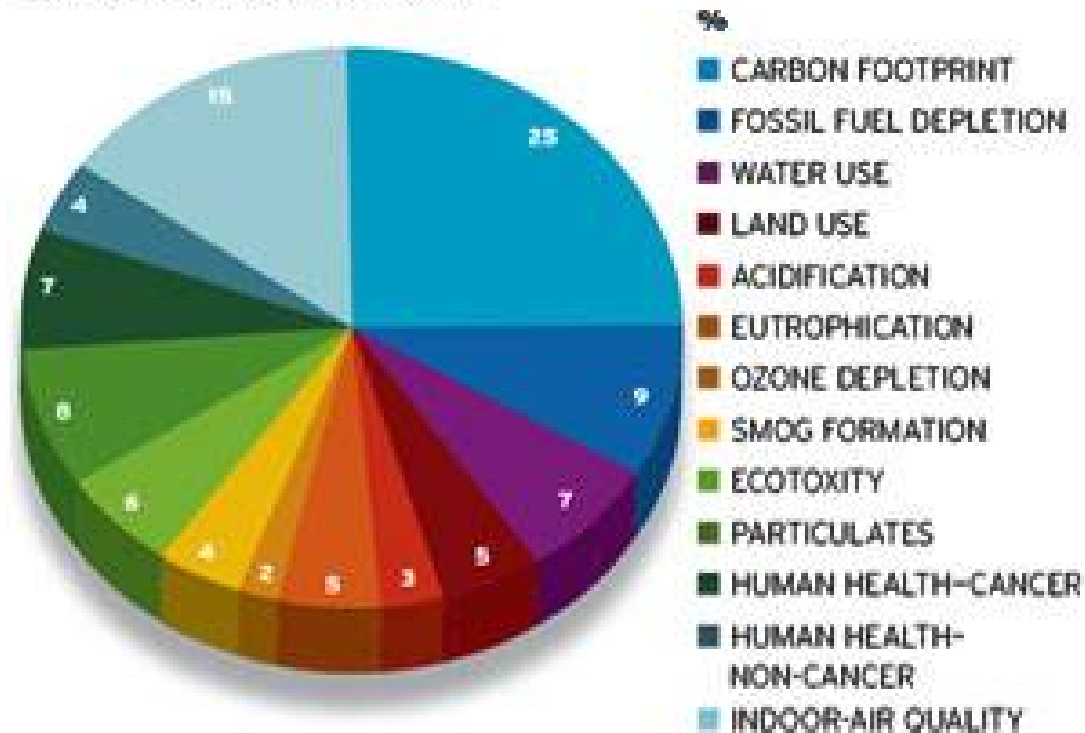


LEED V3 & Climate Change

- **Impact Categories.** impact categories have changed the point structure of individual credits.

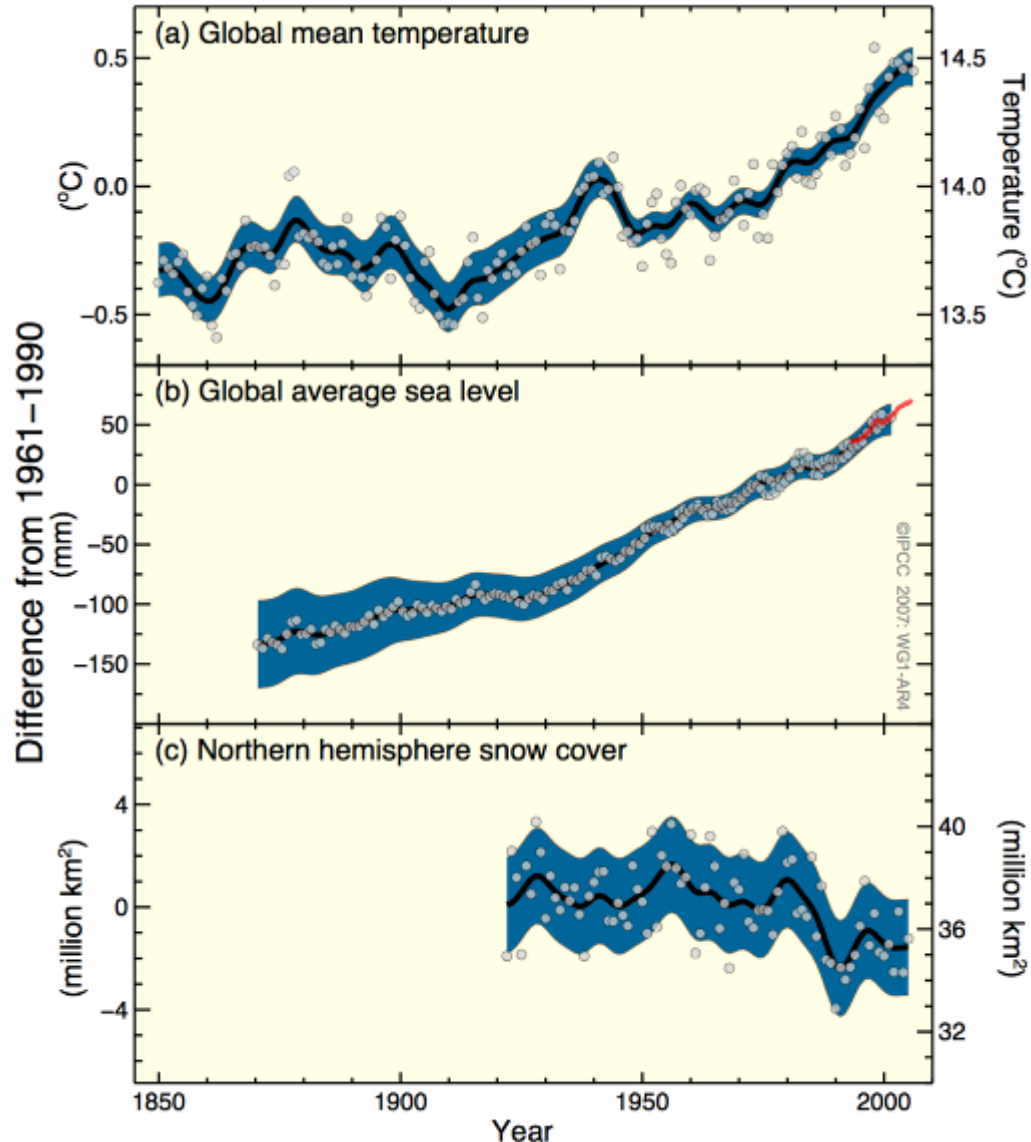
WEIGHING THE CONCERNS

A panel convened by the National Institute of Standards & Technology came up with this assessment of the relative importance of each issue:



Global warming is unequivocally occurring.

Temperature

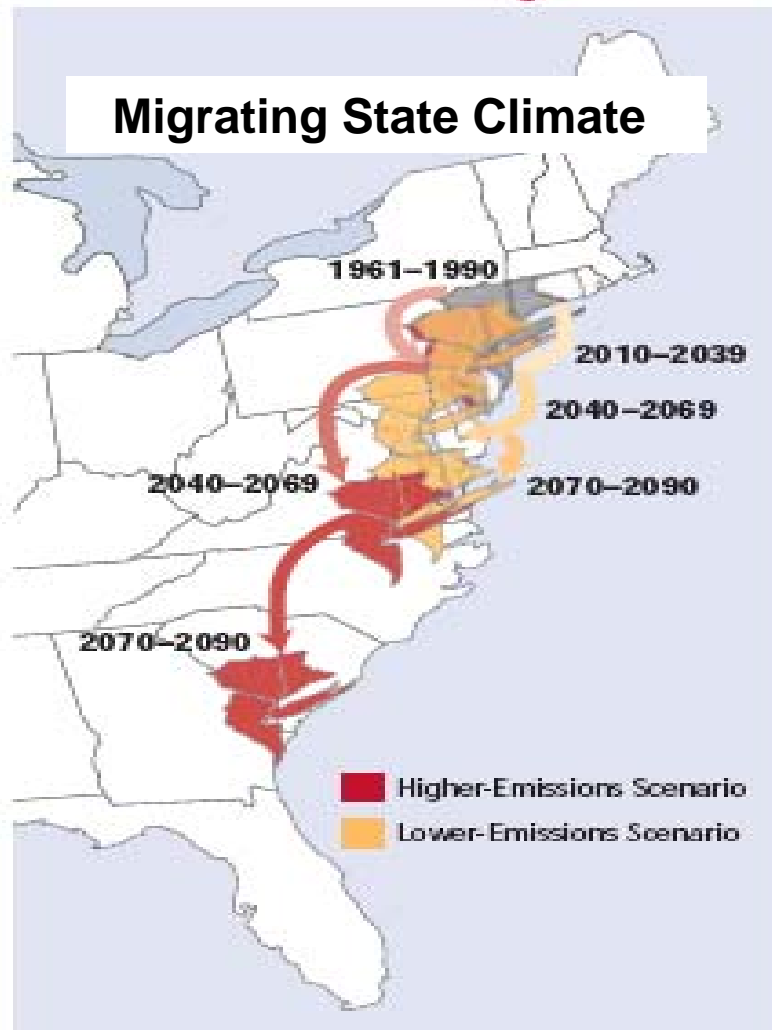


Sea Level

Snow Cover

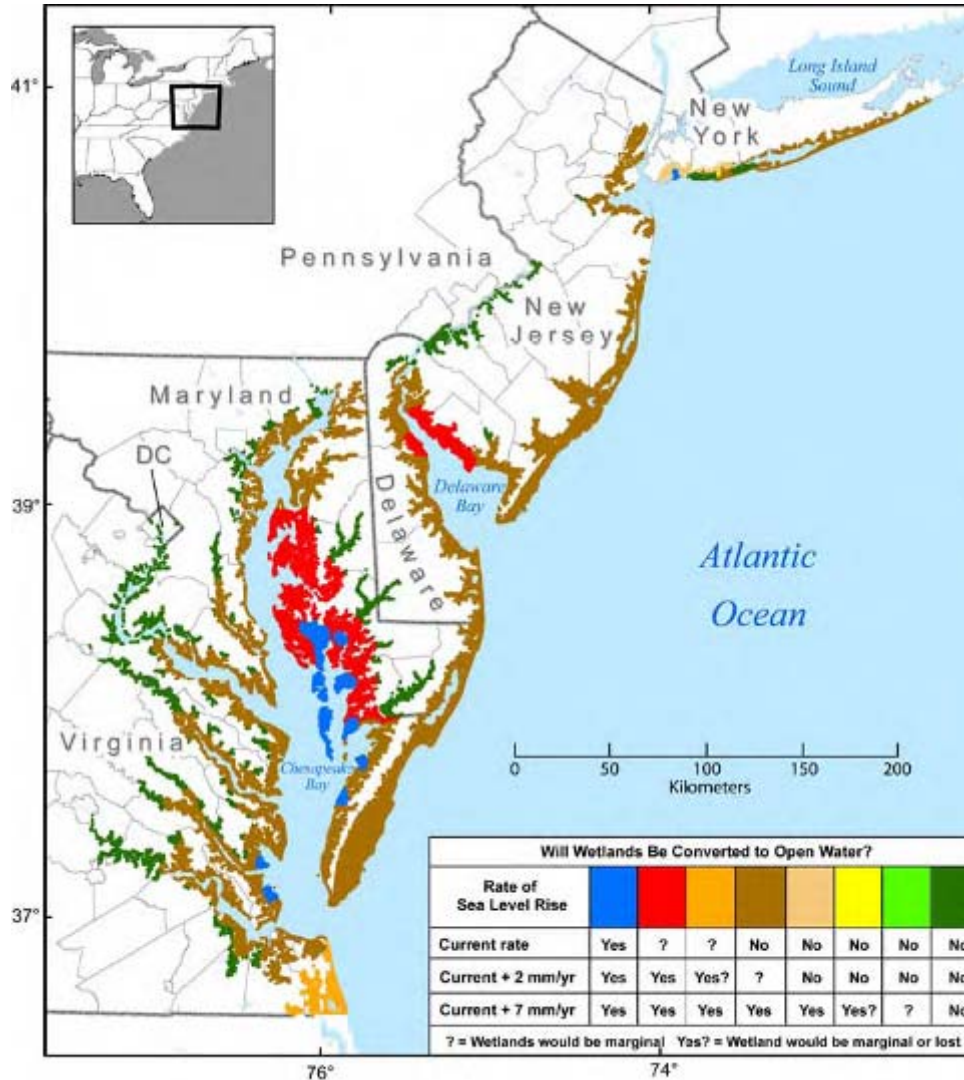
Source: IPCC
The Architectural Group

How much warming is too much?



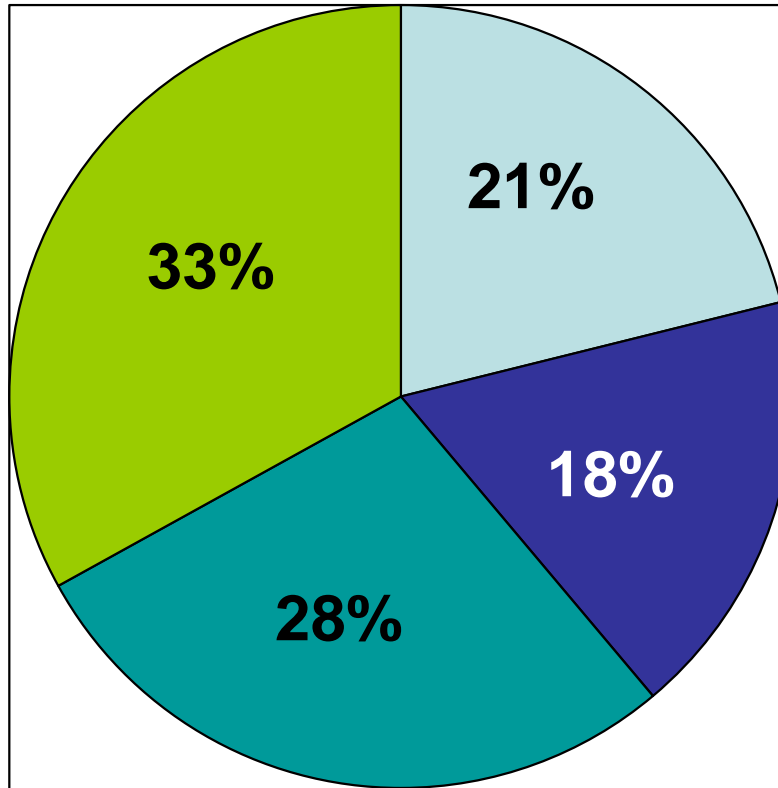
Source: Union of Concerned Scientists: "Confronting climate change in the U.S. Northeast" - July 2007

If we do nothing, coastal communities will flood.



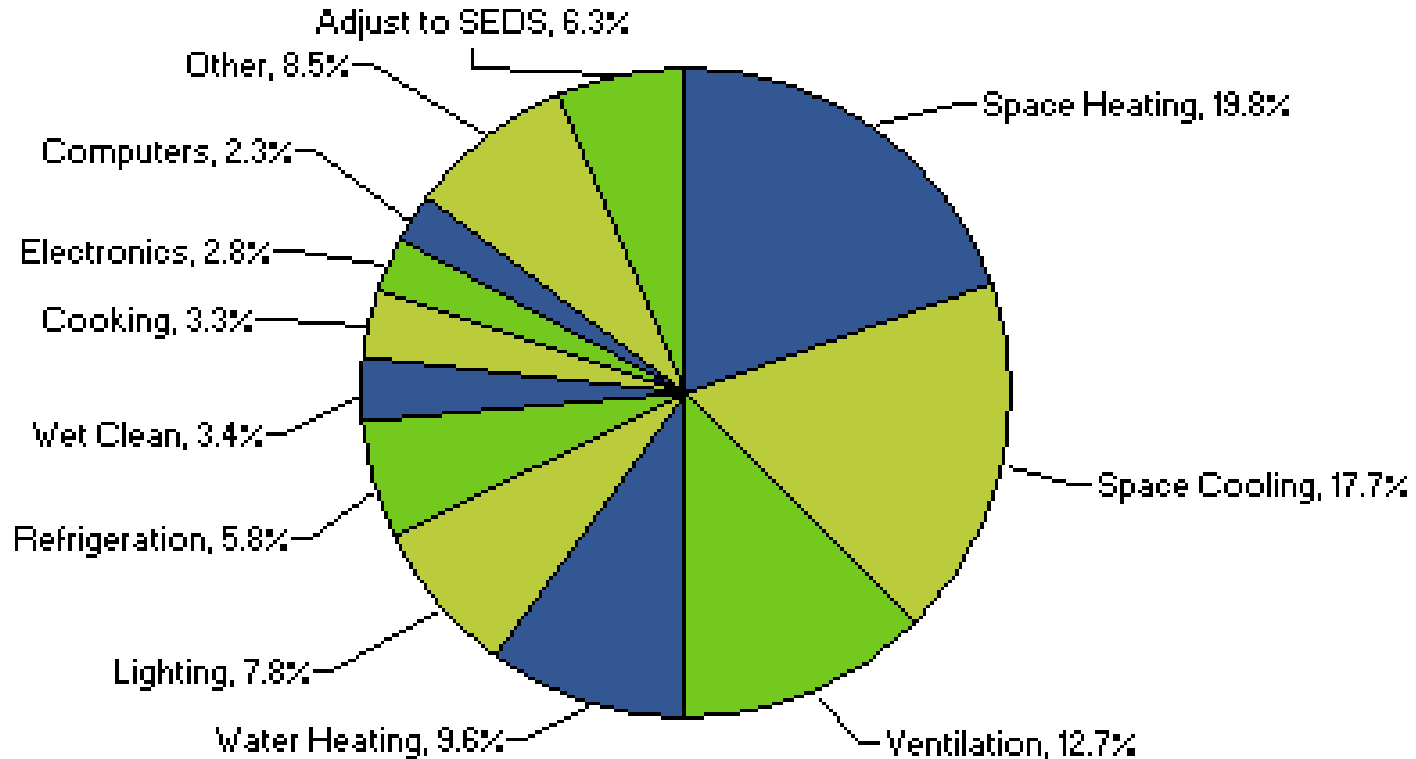
U.S. Environmental Protection Agency, U.S. Geological Survey, National Oceanic and Atmospheric Administration, and U.S. Department of Transportation. "Coastal Sensitivity to Sea Level Rise: A Focus on the Mid-Atlantic Region." *U.S. Climate Change Science Program: Synthesis and Assessment Product 4.1*. January, 2009.

CO2 Emissions by Sector



Where do Buildings Use Energy?

2006 U.S. Buildings Energy End-Use Splits



Buildings Energy Data Book

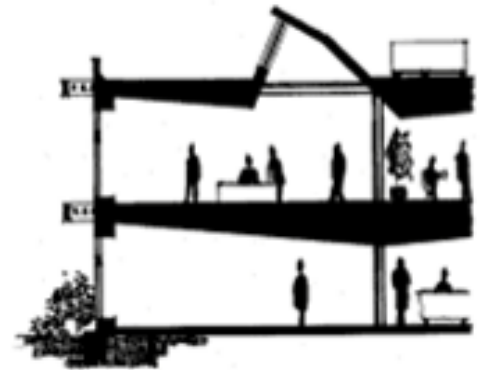
Cost Effective Green Building: Identify synergies in design

FACT: HVAC & lighting account for 75% of building energy use.

- Orientation.
- Renewable energy.
- Daylighting design and automatic lighting control systems integration.
- Better building envelope (windows, insulation/wall construction)
- High efficiency HVAC/lighting/controls.
- Waste recycling.



Building Integrated Photovoltaic (BIPV) Shingles



NET ZERO

LEED Silver Certified

On a building scale: Holmes-Rulli Residence

Size: 2,500sf w/ half basement

Cost: \$500,000

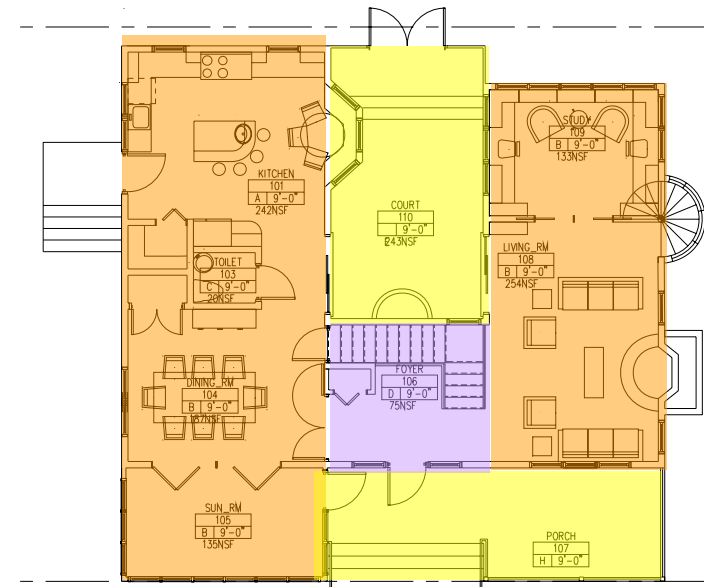
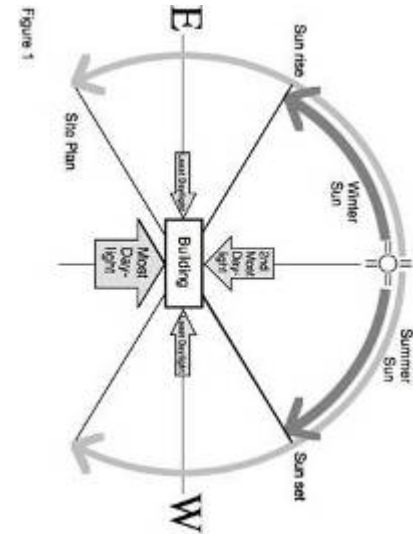
Location: Manchester, NJ

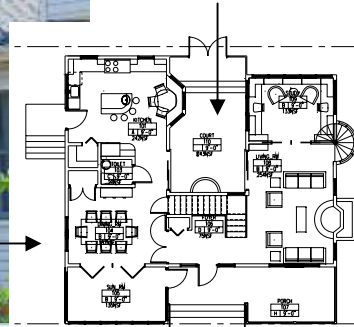
Architect: Jason Kliwinski, AIA, LEEDap

Description: New custom residence

Sustainable Features:

- Orientation for Daylighting
- Natural ventilation
- Super-insulated 2x6 envelope w/ spray foam insulation
- Energy star rated windows, and appliances
- Radiant flooring
- On-Demand water heating







Rainwater Catchment for Irrigation
Native Plantings
Waterless urinal & Dual Flush Toilet
Low flow sinks, showers, & dishwasher
Reduced well and septic needs

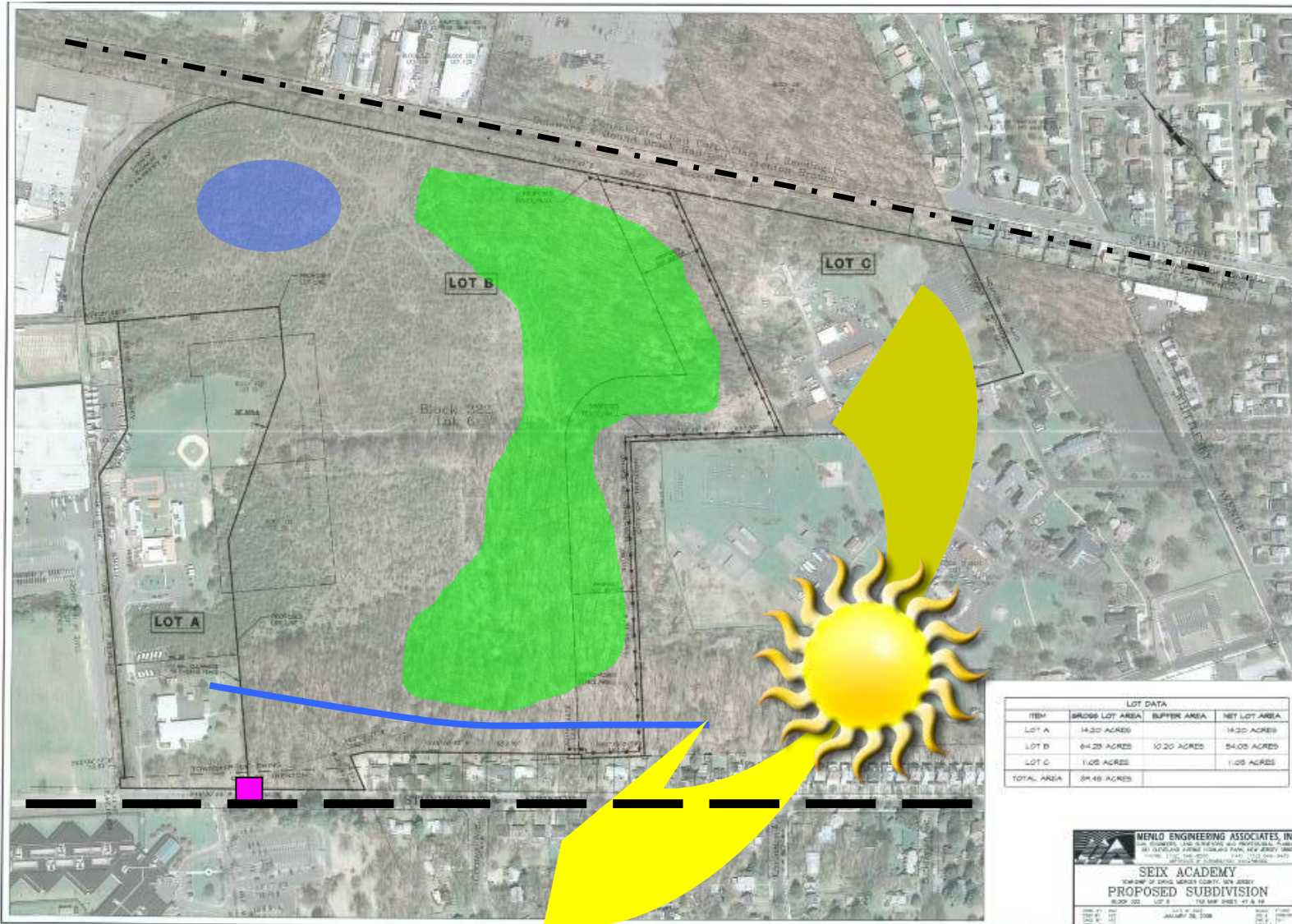
Offset Remaining use



9KW Solar Panel System

- Offsets 100% of annual power usage
- Produces 9,900kwh annually from clean energy
- Provides \$5,400 revenue from NJ SRECs
- Partially funded with \$30,000 grant from NJCEP
- Less than 8 year payback at today's rates

On a neighborhood scale: Seix Academy



On a neighborhood scale: Seix Academy

Size: 60 Acres

Cost: TBD

Location: Ewing, NJ

Architect: Spiezle

Description: New residential campus for troubled K-8 students

Sustainable Features:

- Site LEED ND Designed
- Buildings LEED Homes & School
- Wetland Conservation
- Tree Protection & Restoration
- Low-Impact Development
- Large scale solar panel system & Geothermal Heating & Cooling
- Environmental Center & Onsite food production



On a Campus Scale: Carbon Neutrality at The College of New Jersey

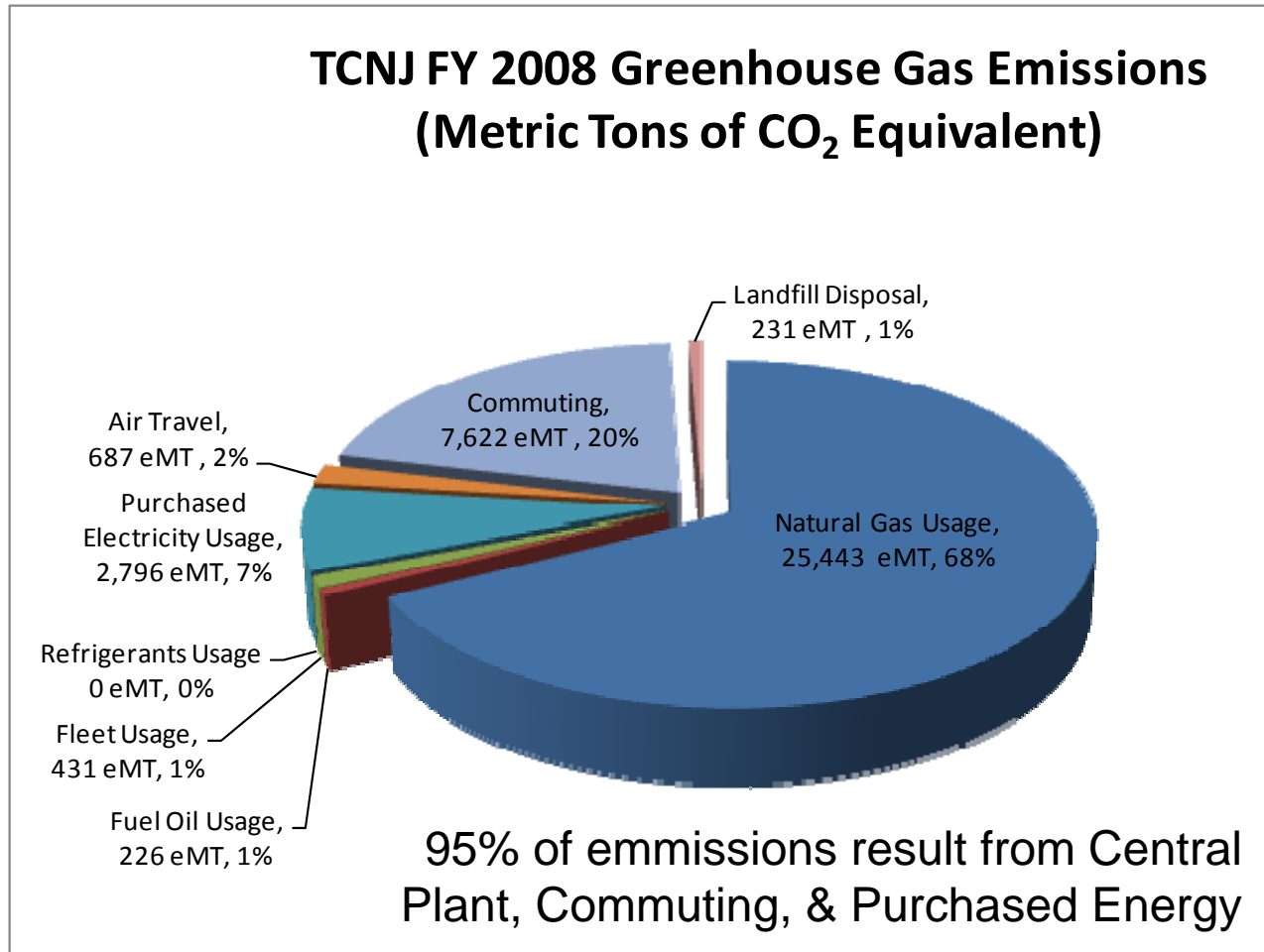
Size: 300 Acres
Location: Ewing, NJ
Architect: Spiezle
Description: Carbon Neutral Campus Plan

Sustainable Features:

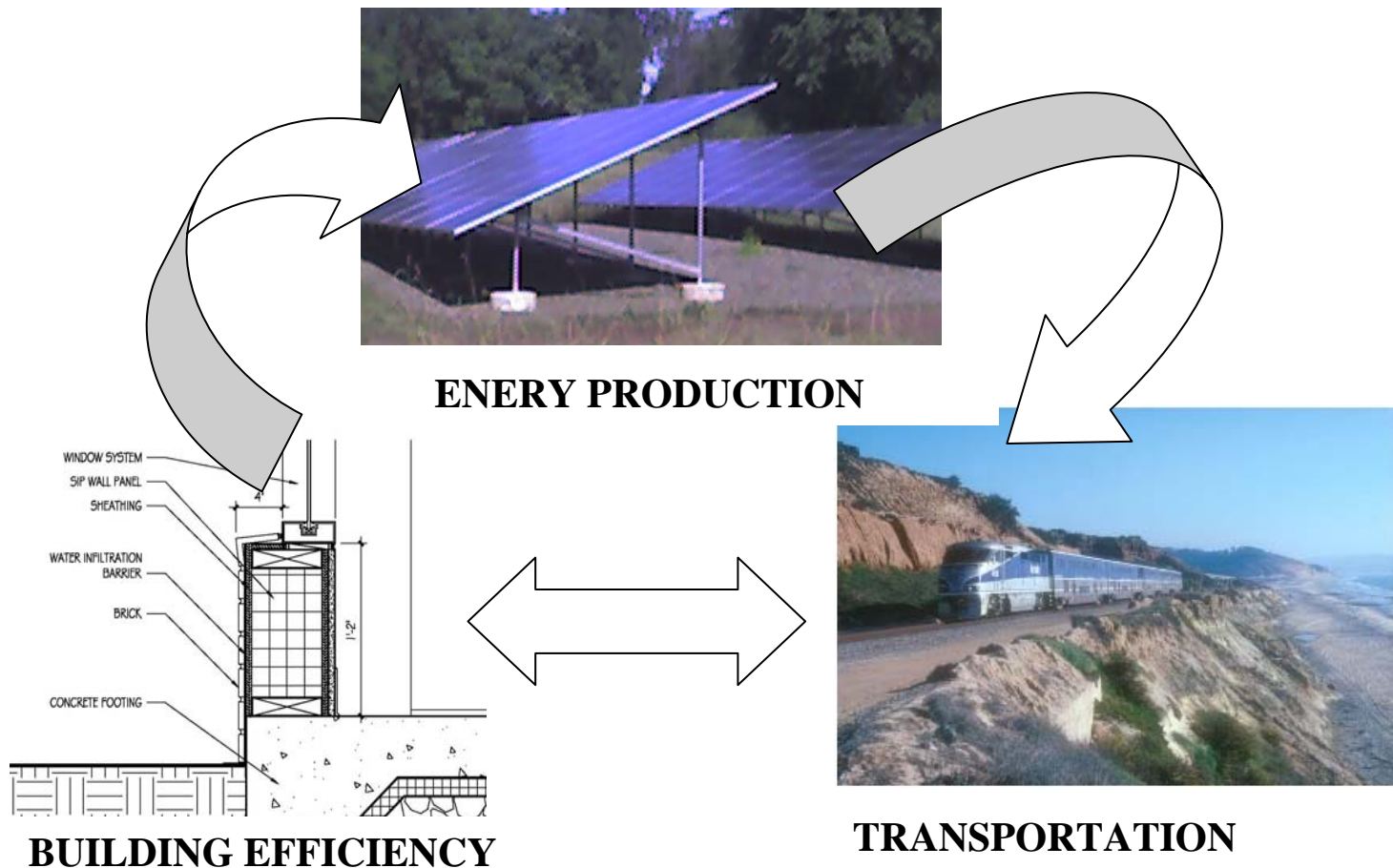
- Energy Efficiency
- Renewable Energy
- Forest Management
- Alternate Transportation
- Waste Recycling
- LEED Construction
- Geothermal Energy



TCNJ Sources of GHG Emissions



Path to Harmony and Balance: Carbon Neutrality is three prong



thank you

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LEED™ *ap*

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