



**ARCH 331: Environmental Control Systems**  
**ARCH 431: Environmental Control Principles**

**331 Discussion: Rob Peña**  
Tuesday, 5:30 - 6:20, 115 Smith Hall

**431 Discussions: Kevin van den Wymelenberg**  
Tuesday, 5:30 - 6:20 and 6:30 - 7:20, Gould 440

**431 Discussions: Travis Anderson**  
Thursday, 5:30 - 6:20 and 6:30 - 7:20, Arch 110

**Exams (50%)**  
• **Weekly Quizzes (25%)**  
• **Final Exam (25%)** Friday 6/13, 4:30 to 6:20 pm

**Design Exercises + participation (50%)**  
**Exercise Subjects\***

1. Case Study of Climate Responsive Design
2. Climate Analysis
3. Envelope Heat Transfer
4. Shading Analysis and Design
5. Thermal Optimization
6. Daylight Model Studies

\*Exercises may be revised to coordinate with your studio project(s)

**COURSE WEBSITE**  
<http://courses.washington.edu/arch3431/index.shtml>

**FINAL EXAM**  
**Friday, June 13**  
**4:30 am - 6:20 pm**

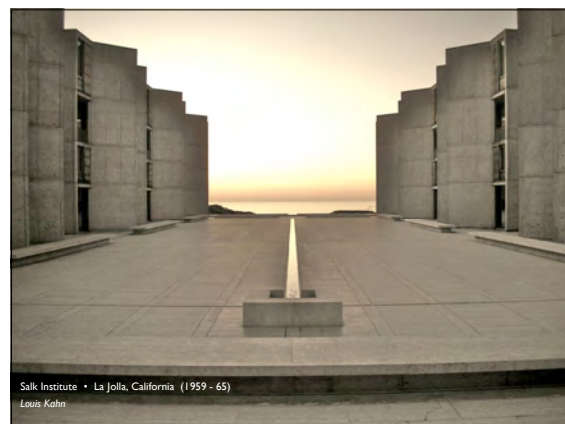
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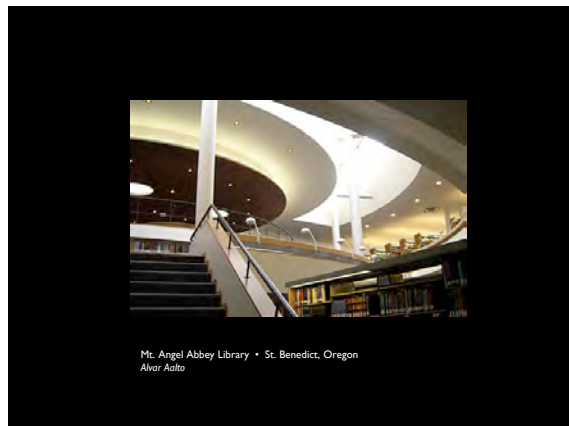
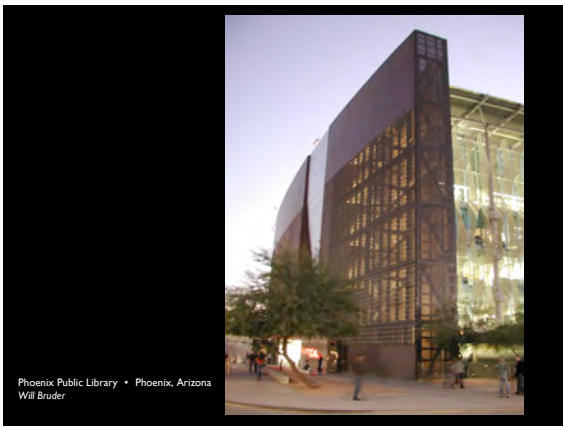
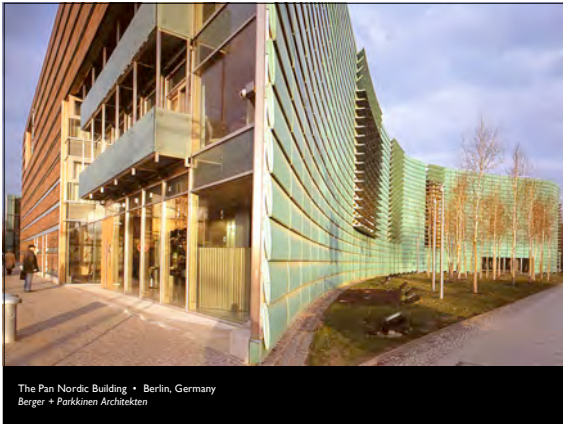
recommended texts

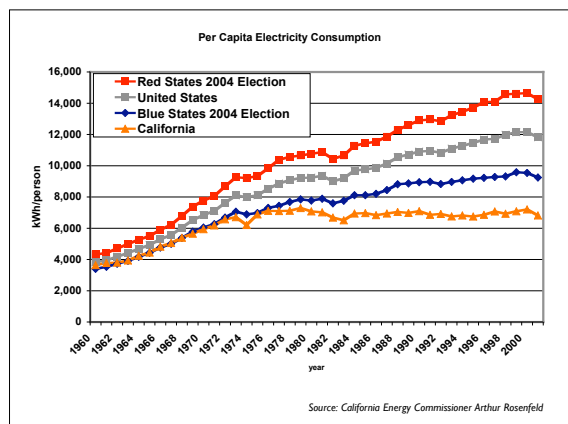
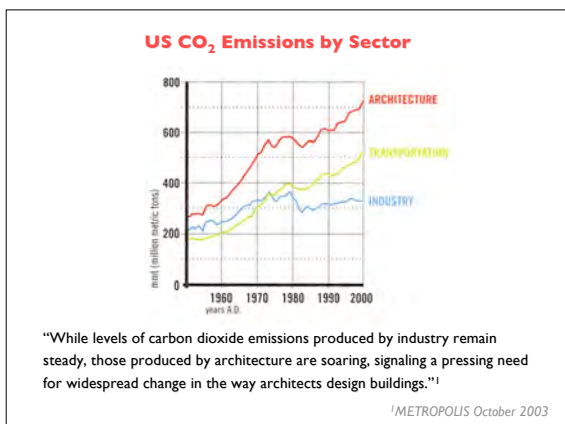
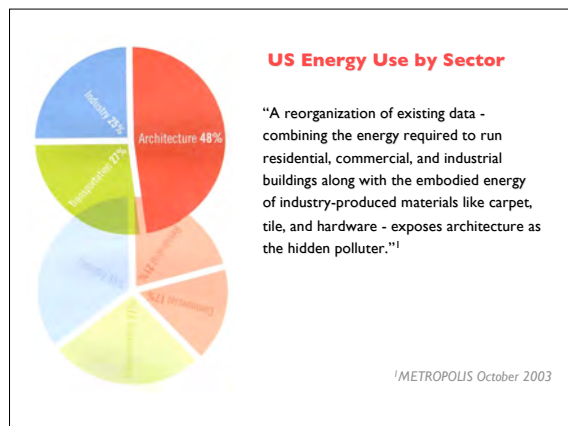
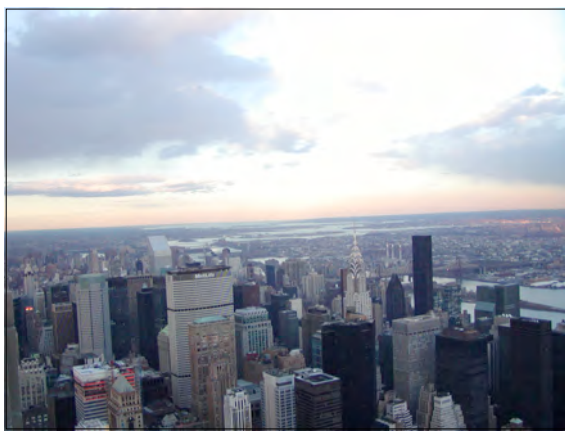
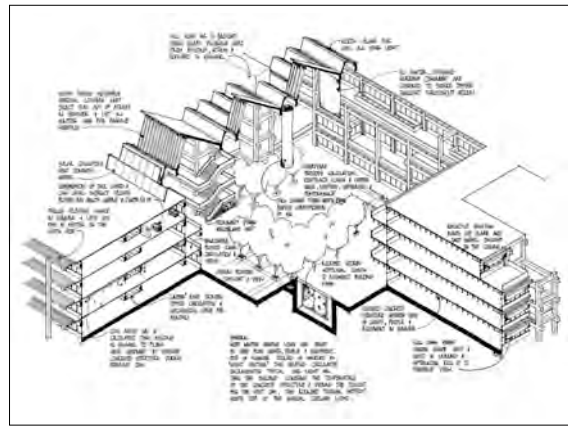
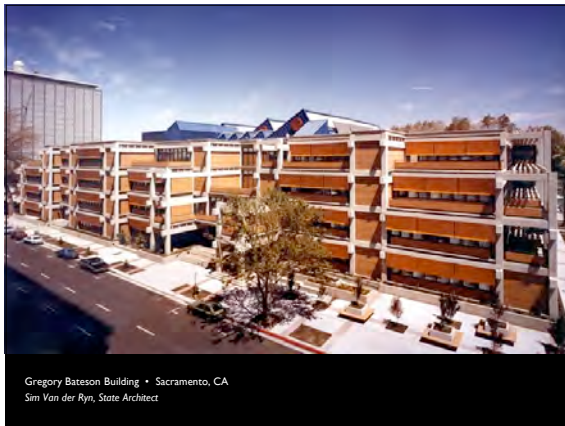
First Reading Assignment for Thursday, 4/3:  
*Sun, Wind & Light (SWL):*  
Sections 38, 43, 46-47, 49

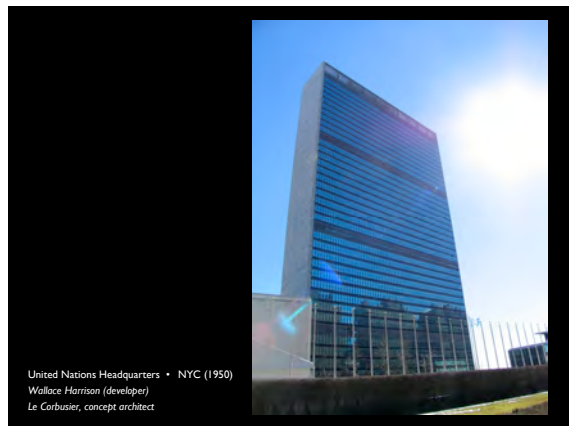
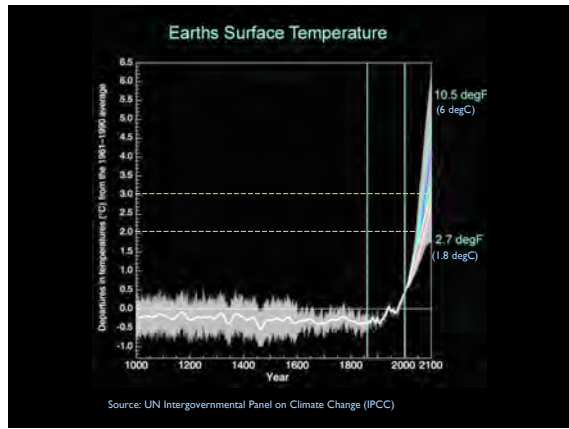
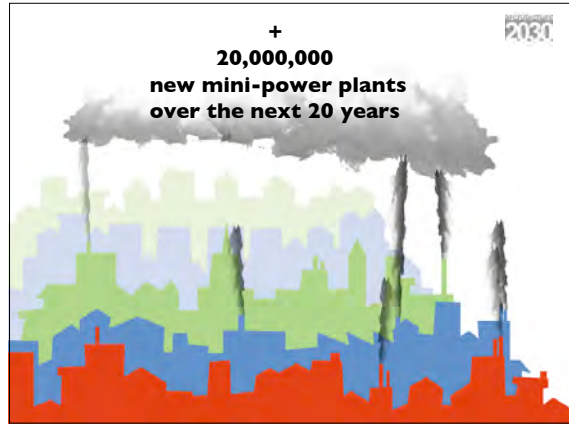
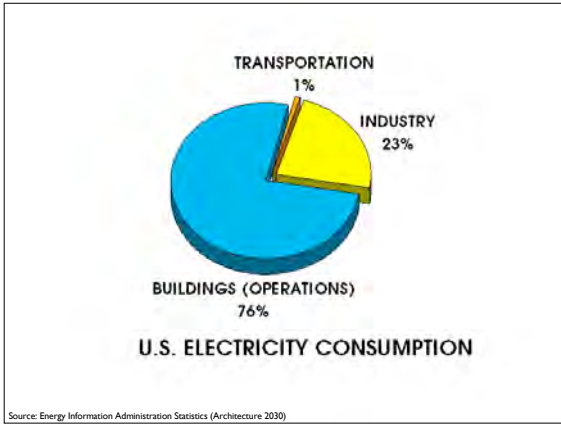
Reading Set 1 (course website):

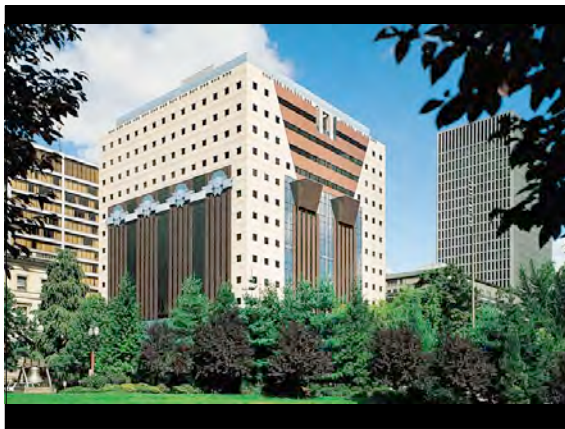
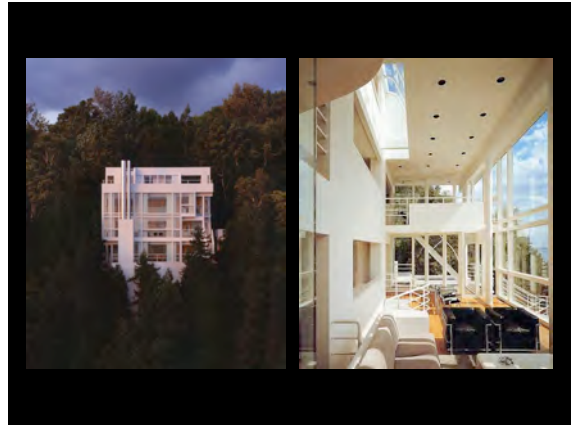
- 1.1 It's the Architecture Stupid, Ed Mazria
- 1.2 The New Red, White & Blue, Thomas Friedman
- 1.3 Blueprint for Disaster, Tom Folger
- 1.4 State of Energy, NY Times Editorial
- 1.5 Letter to the USGBC, Ed Mazria

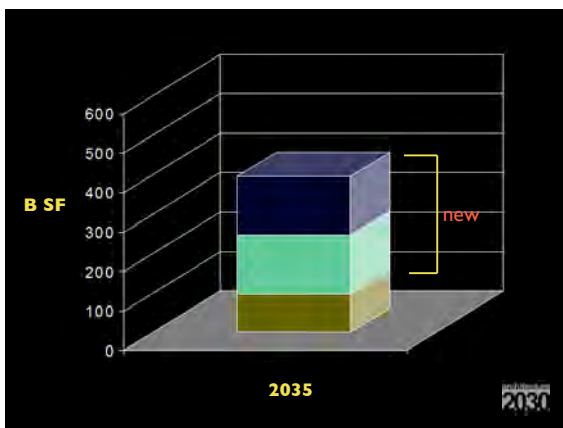
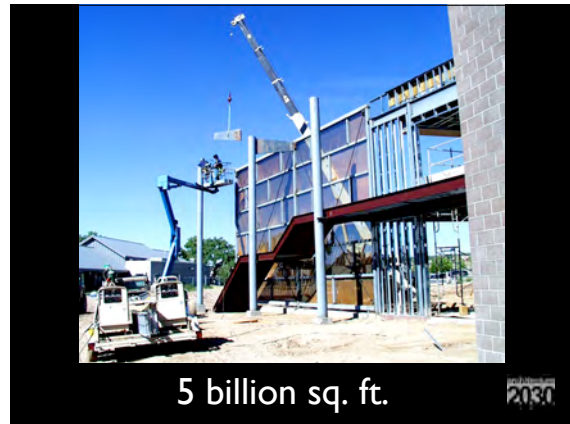












2030 <sup>0</sup>Challenge

<http://www.architecture2030.org>

1. New building project, development and major renovation meet a fossil fuel energy-consumption performance standard of 50% of the regional (or country) average for that building type.


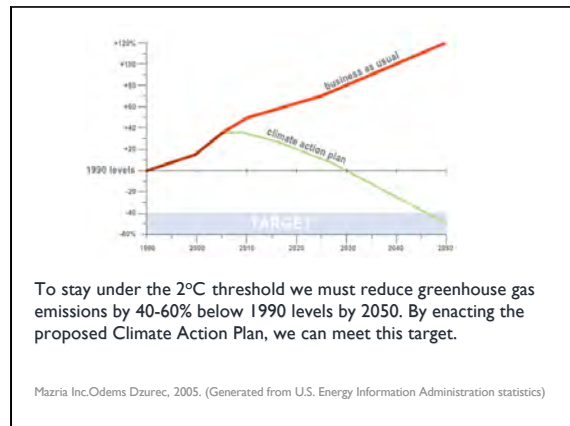
<http://www.architecture2030.org>

2. That at a minimum an equal amount of existing building area be renovated to use 50% of the fossil fuel energy they currently consume.


<http://www.architecture2030.org>

3. New Buildings - 50%  
 2010 – 60%  
 2015 – 70%  
 2020 – 80%  
 2025 – 90%  
 2030 - Carbon Neutral  
 (no fossil fuel energy to operate)

<http://www.architecture2030.org>

How can we meet the  
 2030 °C challenge?



1. design & innovation

- passive solar heating
- passive cooling
- daylighting
- siting
- building shape, color and orientation
- fenestration location, size and shape
- shading
- natural ventilation
- materials / properties
- building type / density / smart growth
- pedestrian and transit oriented development
- landscaping / microclimate



2. add technology

- solar hot water
- solar photovoltaics
- wind microturbines
- geothermal
- biomass
- moveable insulation
- mechanized shading
- high efficiency systems & appliances
- energy management systems



3. Purchase green renewable energy or certified green renewable energy credits (1/5 max.)

- wind
- solar
- geothermal
- biomass

