



Advanced Energy Design Guide: Small Office Buildings (ASHRAE SP-102)

Don Colliver, Ph.D., P.E.
Chm, SP-102 Cognizant Committee
Presented by
Bruce D. Hunn
Director of Technology, ASHRAE

Project Participants:



- Volunteer effort
- 11 person steering group
- 13 person writing team (SP-102)
- 5,000+ person-hours to develop



Goal:

- Present *a way, but not the only way* to build energy efficient buildings which use significantly less energy than those built to the minimum code requirements
- 30% energy savings when compared to ANSI/ASHRAE/IESNA Std 90.1-1999
- 50% and 75% documents to be covered later



Scope:

- Small Office Buildings
- Less than 20,000 sq ft using unitary equipment
- Use energy savings as the independent variable vs. cost effectiveness
- Use practical, off-the-shelf technology
- For use in addition to codes & stds - Is not intended to circumvent them



Objectives:

- Content: provide design strategies / choices and specific recommendations that achieve 30% energy savings relative to Std 90.1-1999
- Target market: contractors, design/build firms and designers involved in building small offices
- Format: document should be short, easy to use, and should contain “how-to” guidance
- Publication type: special publication, subject to peer review, not a standard or code
- Produce a useful document in a timely manner

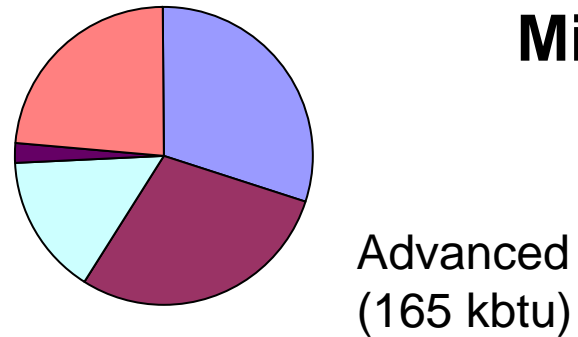
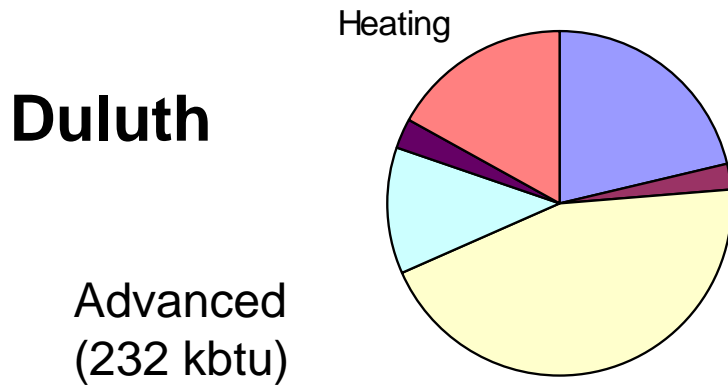
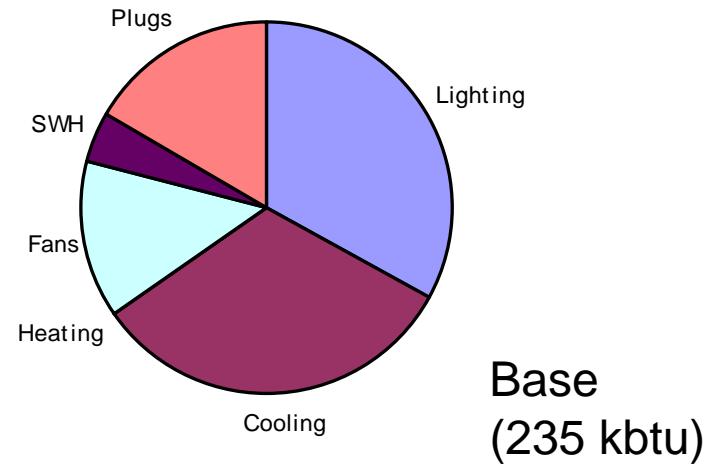
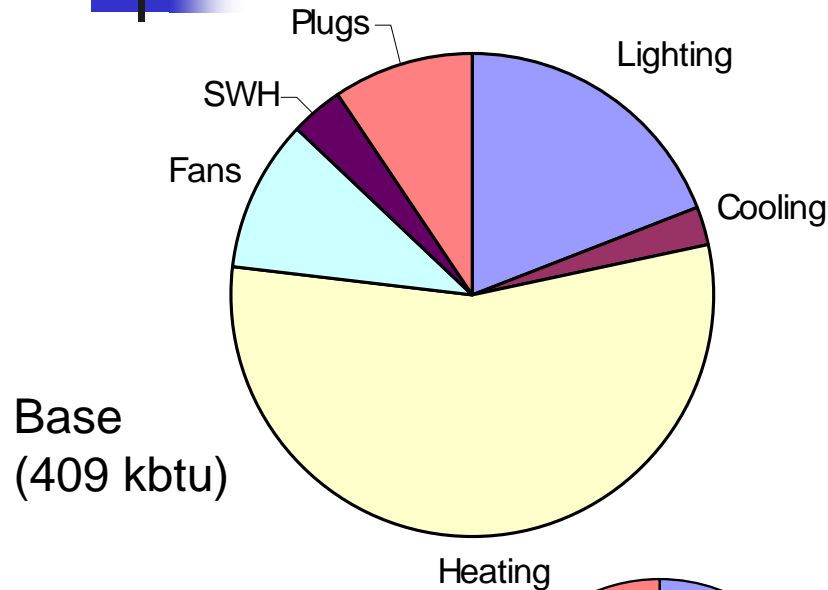


Document Contents:

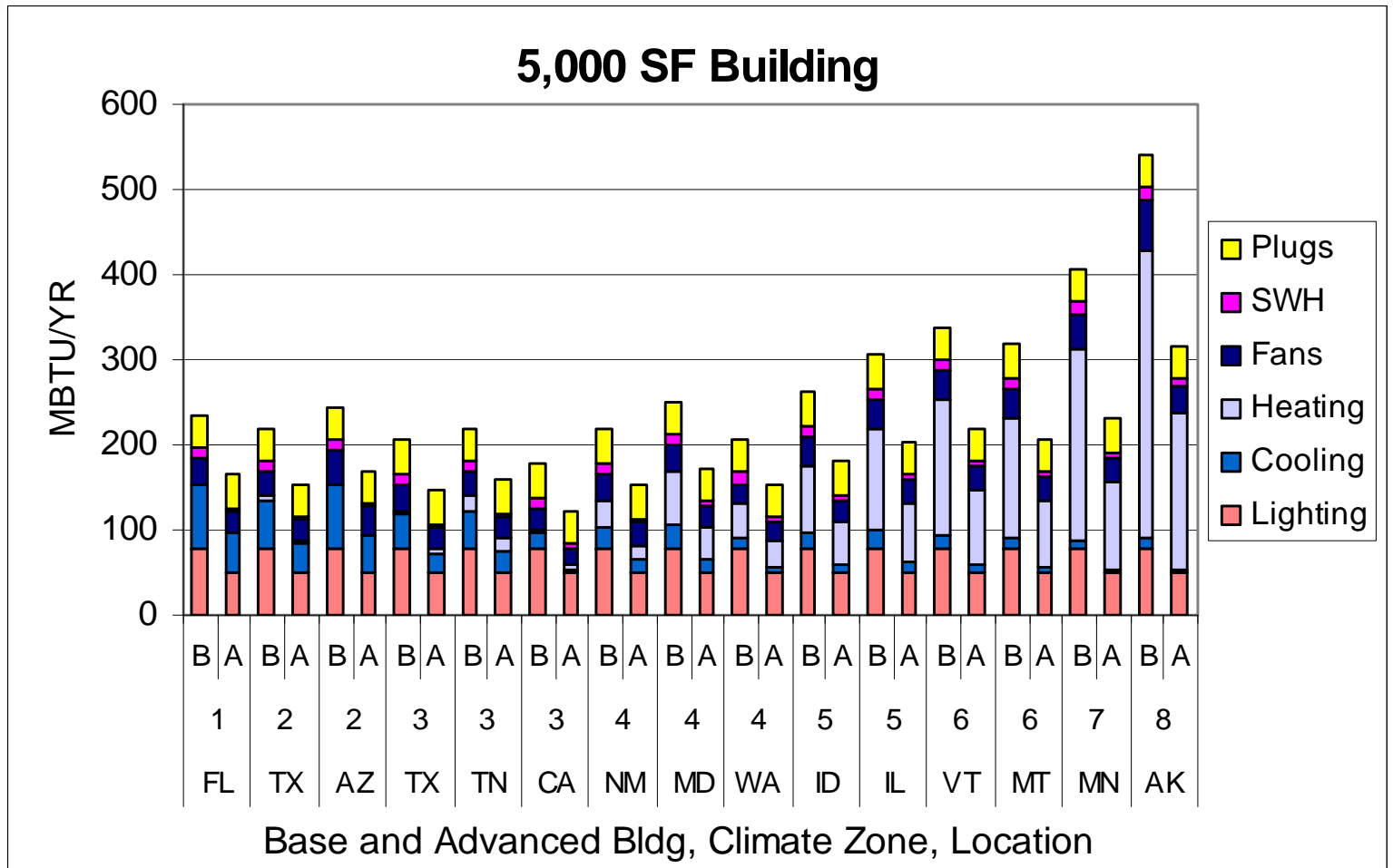
- Introduction
- Integrated Process for Achieving Energy Savings
- Recommendations by Climate
- “How-To” Recommendations



Integrated Design Process:



Integrated Design Process:



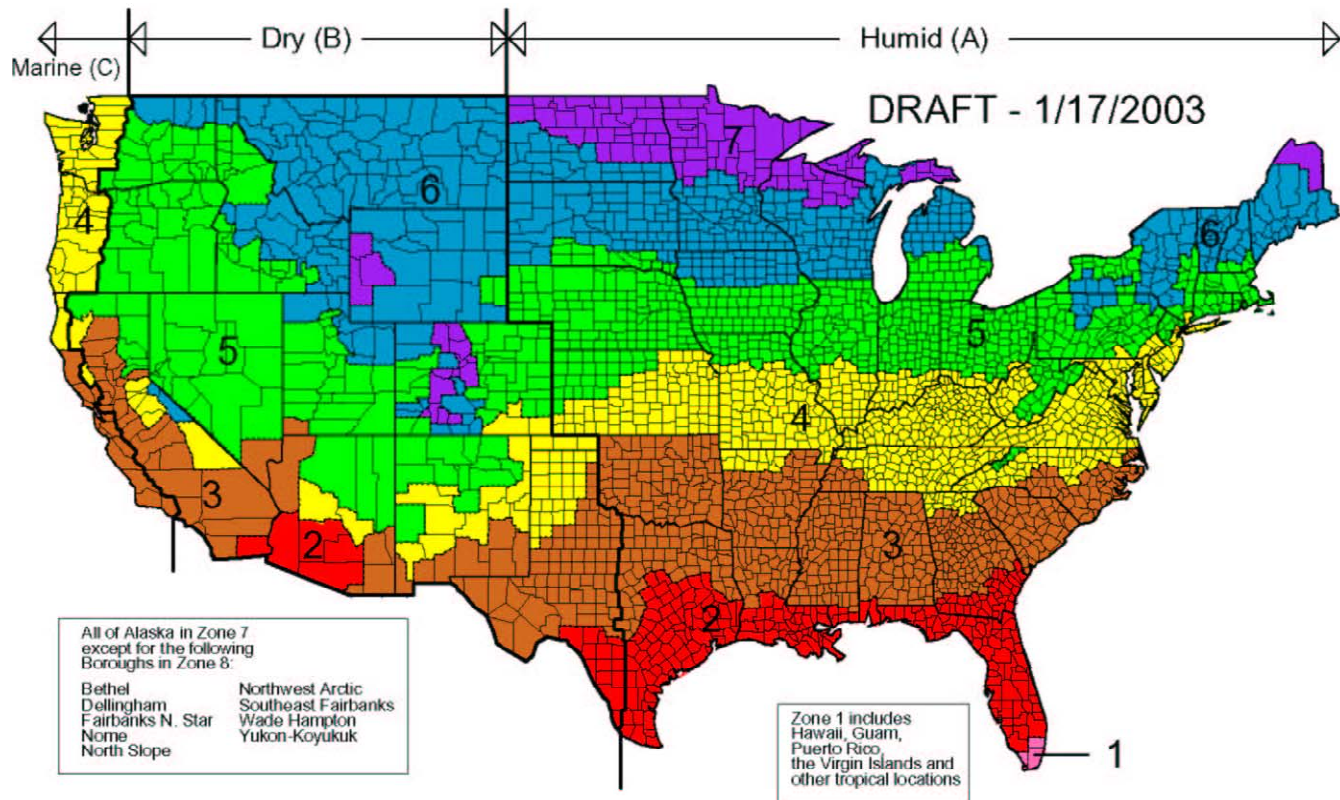


Recommendations Tables

- Given by climate zone
- Combined energy savings based on “systems approach” where all recommendations are used
- Recommendations based upon many DOE2 simulations

Recommendations Tables

(Given by 8 climate zones)





Items Covered in Prescriptive Recommendations:

- Roof
- Walls
- Floors
- Slabs
- Doors
- Vertical Glazing
- Skylights
- Interior Lighting
- HVAC
- Ventilation
- Ducts
- Service Water Heating



“How-To” Recommendations

- Gives Good Design Practice – i.e. The “rules-of-thumb” and “should consider”
- Envelope
 - Opaque Envelope Components
 - Vertical Glazing
 - Window Design Guidelines
 - for thermal conditions
 - for daylighting
- Lighting
 - Daylighting
 - Daylighting Controls
 - Electric Lighting Design - Interior & Exterior



“How-To” Recommendations

- HVAC
 - Loads
 - Humidity Control
 - Energy Recovery
 - Equipment Efficiency
 - Ventilation & Exhaust Air
 - Ductwork
- Service Water Heating
- Plug Loads
- Quality Assurance



Publication Schedule:

- Initial Steering Group Meeting, Aug 2003
- Initial Working Meeting, Oct 2003
- Technical Content Approved, June 2004
- User's Group Review, June / July 2004
- Final Publication Now Available
- ASHRAE Journal Paper, Mar 2005



Additional AEDGs

- Additional 30% Advanced Energy Design Guides (AEDGs) for other building types are being planned
 - Retail/mercantile
 - Low-rise motel/hotel
 - Warehousing
 - Low-rise multifamily
- Other 50% and 75% Guides are also being planned



Summary Remarks:

- There is a demand for recommendations going beyond codes
- Need for giving guidance rather than requirements (i.e. “should” rather than “shall”)
- Performance vs Prescriptive
 - Complex interactions
 - Multiple ways to achieve goal