

## Tales from across the sea.... ASHRAE Dallas 2007

Eur Ing Tim Dwyer BSc(Hons) CEng MIMechE FCIBSE  
Department of Engineering Systems  
London South Bank University  
timdwyer@lsbu.ac.uk



- ASHRAE Technical Meeting
  - 2,634 registered
- AHR Expo
  - 8 acres exhibition space
  - 1800 manufacturers from 32 countries
  - about 28,000 visitors

## AHR Expo

Crowds pour in to the 8 acres



## Expo Crowds

'Hands on' demos



# ASHRAE

'Licence to Chill' Rap

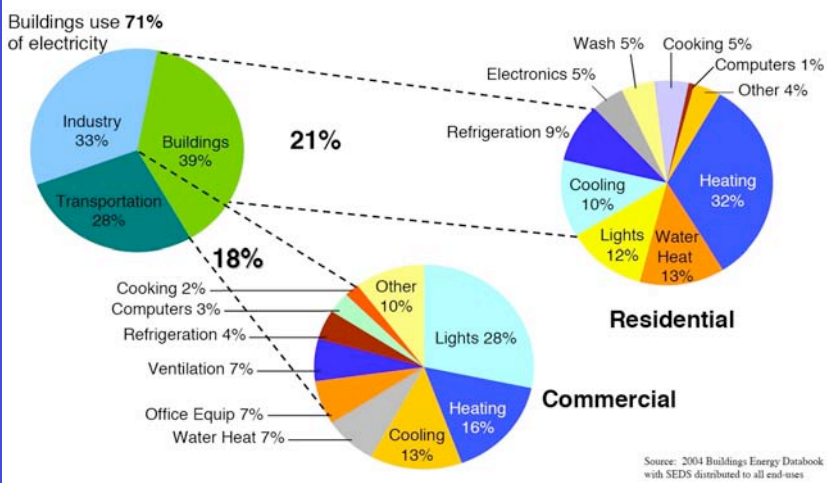


# Jeff Littleton

CEO gets energised



# US Energy Use



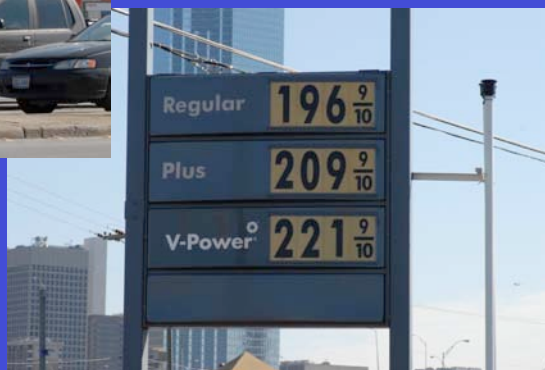
# Fountain Place



## Fountain Place



## The real driver for change?



# Senate unclear on climate bill

By SUDEEP REDDY  
Washington Bureau  
sreddy@dallasnews.com

WASHINGTON — More senators are raising concerns about global warming, but their lack of consensus on legislation was clear Tuesday at the first hearing about the problem in the new Congress.

The split — with lawmakers acknowledging the risks of climate change, but many opposed to forcing restrictions on industry — could impede the momentum Democrats have



Barbara Boxer

tried to build since the November elections.

Tuesday's meeting of the Environment and Public Works Committee brought about a third of the Senate forward to share proposals and views about global warming.

Several lawmakers noted utilities' plans to build 150 coal plants across

the nation, including 11 proposed in Texas by TXU Corp.

Many displayed an uneasy stance about coal, aiming to discourage carbon emissions from the abundant source of fuel, but also noting it's unrealistic to consider cutting off a source of half the nation's electricity.

Sen. Barbara Boxer, D-Calif., the committee's chairwoman who has publicly warned TXU about its plans, said, "We cannot turn our back" on the fuel source.

"We have 250 years of coal in Amer-

ica," Ms. Boxer said.

"We have to make sure the technology steps up and helps us resolve and solve this problem."

The Democrats' takeover of Congress and President Bush's mention of climate change in his State of the Union speech last week — his first use of the phrase in the annual address — have led many supporters of legislation to see new hope after years of gridlock over the issue.

See SENATE Page 5D

3/4 11/15/07 11:00 AM

DallasNews.com

M Sunday, January 28, 2007 Page 11A

## SCIENCE & MEDICINE

# Resistance to action on global warming is melting

**U.S. seeing major political shift toward recognizing problem**

From Wire Reports  
NEW YORK — Maybe it's the weird winter weather, or the newly Democratic Congress.

Maybe it's the news reports about starving polar bears, or the Oscar nomination for Al Gore's global warming film, *An Inconvenient Truth*.

Whatever the reason, years of resistance to the reality of climate change are suddenly melting away like the soon-to-be-history snows of Kilimanjaro.

Now even President Bush says

control and prevention, NASA, Harvard and other institutions.

There is still plenty of opposition to action on global warming in the evangelical and business communities, but the tide is clearly turning.

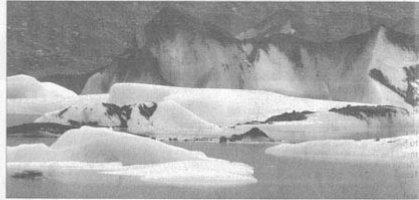
"You're seeing a major political shift that is fairly broad-based," said Robert Watson, a scientist at the World Bank and former chairman of the United Nations' scientific panel responsible for evaluating the threat of climate change.

Scientists have been at the vanguard of the climate change issue for decades. As early as 1965 a scientific advisory board to President Lyndon B. Johnson warned that increasing atmospheric carbon dioxide could lead to "marked

In 1988, the United Nations created the Intergovernmental Panel on Climate Change. Every five or six years since 1990, the panel has released an updated assessment of the environmental threat posed by global warming.

The scientists who will gather in Paris this coming week to complete the first section of this year's report are not allowed to talk about the early drafts that have been circulating in recent months.

But there is little doubt that when the report is released Friday it will include references to some of the specific environmental effects of global warming that have already been observed, and an even stronger statement about the imminent threat.



As evidence of global warming, analysts point to the melting of a glacier in Iceland's Þorsmork. FILE 2006/Associated Press

**The Dallas Morning News**  
 Dallas, Texas, Tuesday, January 30, 2007  
 DallasNews.com 50 cents

**A quiet return**  
 Norah Jones reclaims soulful ballads on her latest album, released today.  
 #GUIDELIVE, 1E

**FOR HIRE?**  
 Hall of Fame linebacker and current 49ers assistant coach Mike Singletary will interview today with the Cowboys.  
 #SPORTSDAY, 1C

Cloudy, windy  
 High: 45 Low: 32  
 Metro, Back Page  
 Meet possible  
 his week  
 temperatures are  
 pected to dip this  
 week, creating a possi-  
 bility for sleet in the  
 Dallas area Wednesday.  
 w. 12B

**Utilities leaning on lobbyists**

**Energy firms shell out more than any other industry this year**  
 By EMILY RAMSHAW  
 Health Business  
 eramshaw@dallasnews.com

AUSTIN — Texas utility companies are poised to spend more than any other industry to lobby lawmakers this year, state records show, as the firms seek to keep permits for coal-fired power plants on track and stave off hard-nosed environmental standards and new controls on prices.

Energy companies have signed off on more than 350 lobbying contracts for 2007 and intend to spend between \$10 million and \$20 million protecting their interests this session, according to a Dallas Morning News analysis of state lobbying reports.

That's more lobbying money than has been earmarked for any other field, including health care, special interest groups and municipal governments — which have more lobbying contracts. And the utilities have hired some of the state's best-known lobbyists.

The energy companies say they need the help as the Legislature considers changes that could affect their business plans for years to come.

But the extra-large lobbying effort spells bad news for competitive electric rates, said Tom "Stubby" Smith, director of the watchdog group Public Citizen.

"TXU and the other big energy companies have enough lobbyists to beat both arms and one leg of the entire Senate and the key committees of the House simultaneously," Mr. Smith said. "What it means is that the average citizen's voice is drowned out."

See UTILITIES Page 84

**BIG SPENDERS**  
 Here's what top interests and industries are poised to spend on lobbying the Legislature this year.

Sectors	Millions of dollars
Energy	18
Municipal	12
Special/religious interests	10
Health care	8
Financial	6
Communications	4

Note: State law requires that the value of contracts be reported only in broad ranges, not precise amounts.  
 SOURCE: Dallas Morning News analysis of lobbying contracts

**Terry Townsend**  
 ASHRAE President



*"It is now our time to carry the fire of the ASHRAE Promise of a sustainable future"*



## PV Panels





## Biofuel Boilers



## Water Reclamation

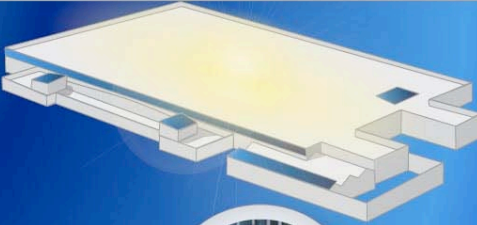


**McKINNEY EXPERIMENT SOLAR ELECTRICITY** **WAL\*MART**

**2.0 kW**

power coming from solar panels right now

**LIVE DATA** ↻



**SOLAR ELECTRICITY**

WIND POWER

RAIN CAPTURE

VENTILATION SYSTEMS



The same type panel is used to illuminate a monument sign at the main parking entrance, and operate an aeration system for the Retention Pond.



FOR MORE INFORMATION GO TO [WWW.WALMARTFACTS.COM](http://WWW.WALMARTFACTS.COM)

Fat Spaniel TECHNOLOGIES

**Guardian Unlimited**

[Read today's paper](#) - [Jobs](#)

Make a green start to 2007 vote now in the Observer Ethical Awards for your chance to win a trip to Paris and Belgium with Eurostar

in association with **ECOVER**  
Effective Cleaning - Ecologically

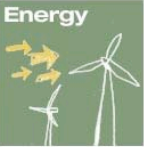
Search:

Guardian Unlimited Web

**environment** Energy

Home | [Climate change](#) | [Conservation](#) | [Travel](#) | [Energy](#) | [Ethical living](#) | [Food](#) | [Water](#) | [Pollution](#)

**Energy**



**Search Environment**

**Go to ...**

More on energy

Archived articles: energy

**Jobs from our site**

> [LONDON BOROUGH](#)

## Is Wal-Mart really going green?

It's no surprise the world's biggest retailer is keen to publicise its increasingly ethical credentials, says Andrew Clark

**Monday November 6, 2006**

[The Guardian](#)

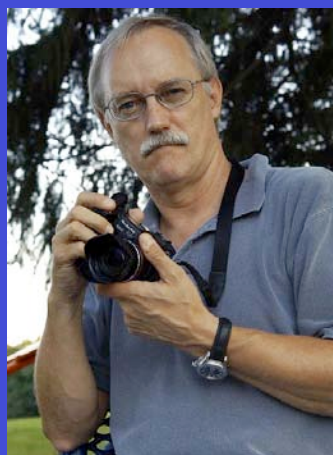
The featureless midwestern fields of Bentonville stretch as far as the eye can see. The county is "dry" with no pubs or bars, and a huge new church is being thrown up along the highway. The local airfield is so far from anywhere that it does not even bear the name of a city - it is merely North West Arkansas Regional Airport.

Bentonville is the home of the world's biggest retailer, Wal-Mart, a company so vast that its sales of \$31.5bn

**Diana Nyad**  
Motivational plenary speaker

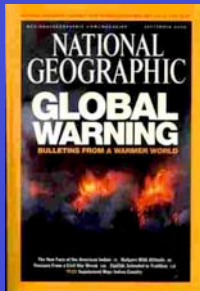
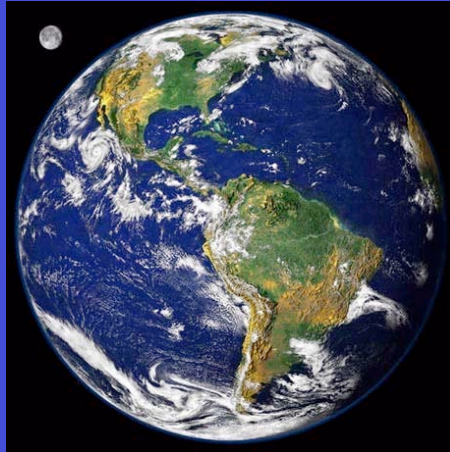


**Dennis Dimick**  
Keynote speaker





## Global switch



## Glacier Park Montana



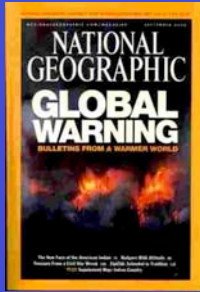


## Florida storms

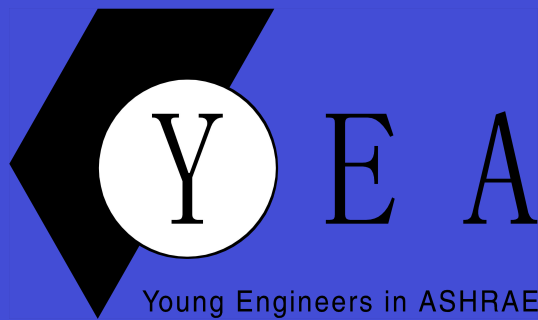


## Antarctic refugees

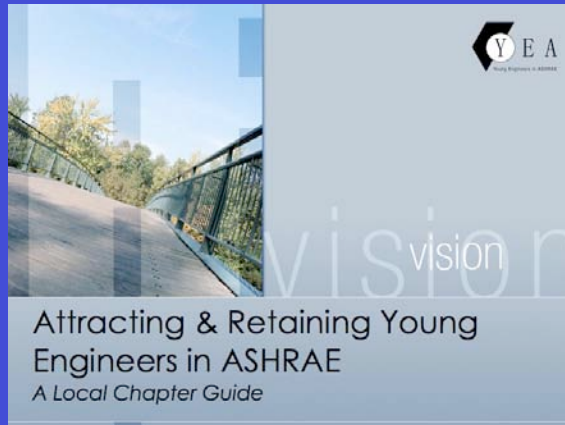




## Arctic Hobo



## Encouraging Lifelong Development



## Student Presentations

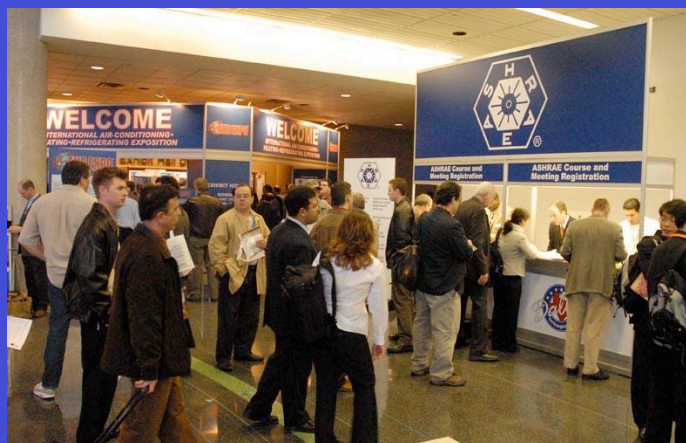


# Michael Norton

CIBSE ASHRAE Group Graduate of the Year



# Expo keen to learn





## Trade Show Tech Session



## Net Zero Energy Building Case Study: Science House

Steinbock, Eijadi, McDougal

- Classroom 53.9 m<sup>2</sup> (61%)
- Private office 13 m<sup>2</sup> (15%)
- Vestibule 10 m<sup>2</sup> (11%)
- Restroom 11.9 m<sup>2</sup> (13%)
- Total 88.8 m<sup>2</sup>

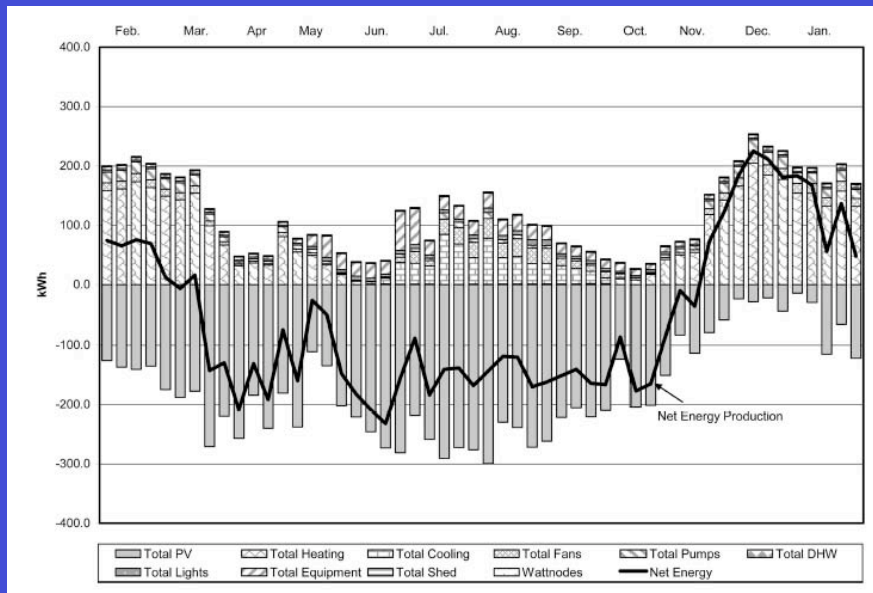
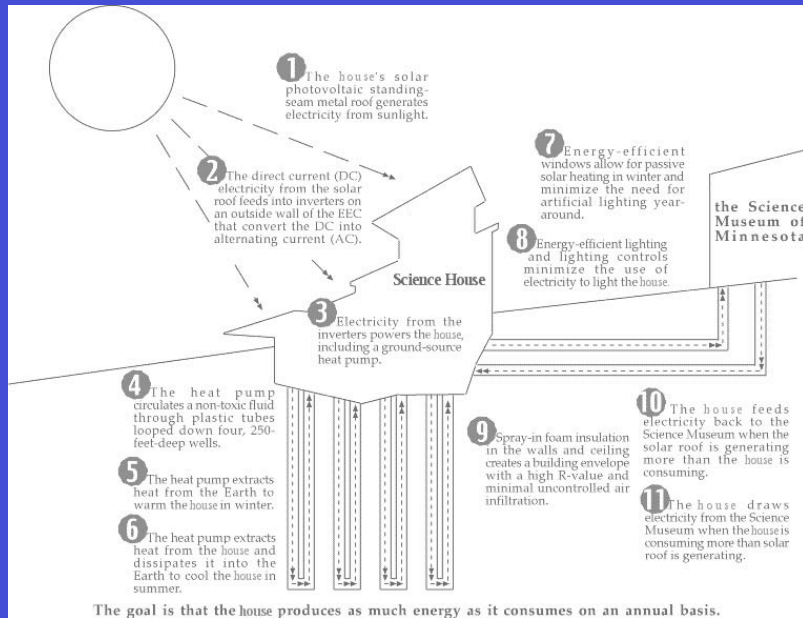


## Methods applied (1 of 2)

- Dimming daylighting controls + HP glazing
  - 1.82 W/m<sup>2</sup>K, SHGC 0.44, light transmittance 0.73
  - saved 26% over base case
- High-efficiency ground-source heat pump with variable loop pumping
  - saved 20% over base case
- Heat pump assisted domestic hot water
  - saved 15% over base case

## Methods applied (2 of 2)

- Occupancy sensor control of all lights
  - saved 11% over base case
- Unoccupied temperature setback/setup
  - saved 5% over base case
- Total ventilation energy recovery
  - saved 3% over base case



## Lessons Learned

- trade-offs during the design process
- photovoltaic system must be integral
- window placement based on performance
- PV installation logistics tricky
- visible systems can give acoustic problems
- clear comms needed - designers & installers
- simple things can sometimes be overlooked
- comprehensive data acquisition is key
- **building has exceeded the energy goal**

[www.smm.org/sciencehouse/](http://www.smm.org/sciencehouse/)

## EPAct Building Tax Deductions

- Tax deduction of \$1.80 per square foot (£10/m<sup>2</sup>) for commercial buildings that exceed the energy efficiency of a “baseline” building in ASHRAE 90.1-2001 Building Code by 50%.
- Tax deductions are also available for “sub systems” (eg Lighting; HVAC; Water Heating Envelope) that increase efficiency by 50%, up to \$0.60 per square foot (£3/m<sup>2</sup>)

## EPAct Proving

- Evidencing software certified by DOE
- Buildings must be certified as to meeting the qualifications
- Buildings must be certified by 3rd party qualified personnel
- Statement must say that the building owner has received an explanation of the energy efficiency features and energy cost savings

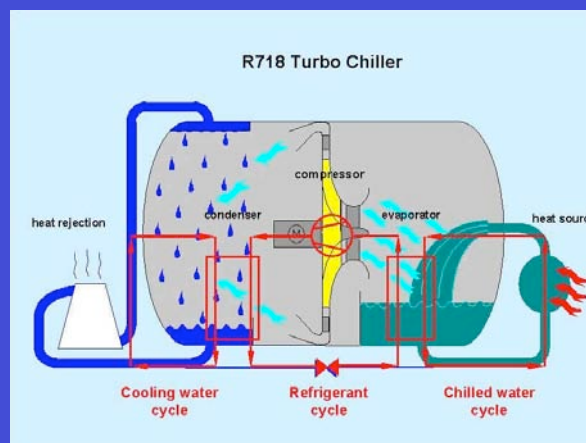
# EPA Act

For some background

<http://www.energy.gov/taxbreaks.htm>

[http://www.eei.org/meetings/nonav\\_2006-11-30-jc/Rosenstock.ppt](http://www.eei.org/meetings/nonav_2006-11-30-jc/Rosenstock.ppt)

# Water as Refrigerant



## Water - excellent COP

For background see

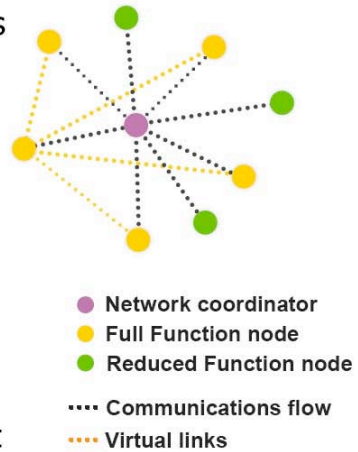
<http://www.egr.msu.edu/mueller/>

## Emerging Wireless Technologies

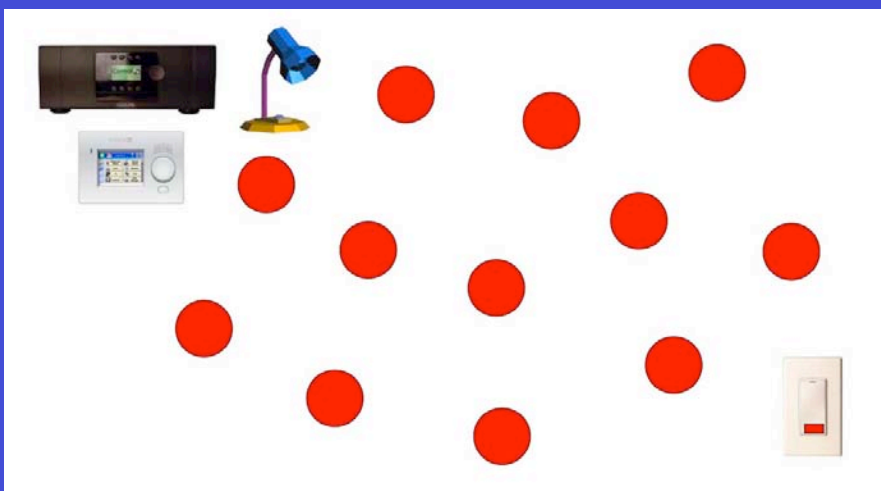


## ZigBee

- 65,536 network (client) nodes
- 27 channels over 2 bands
- 250Kbps data rate
- Optimized for timing-critical applications and power management
- Full Mesh Networking Support

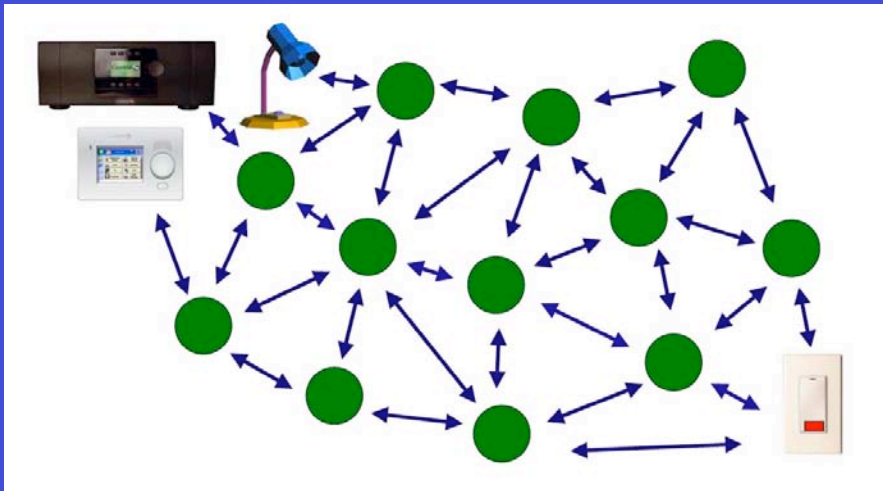


## ZigBee

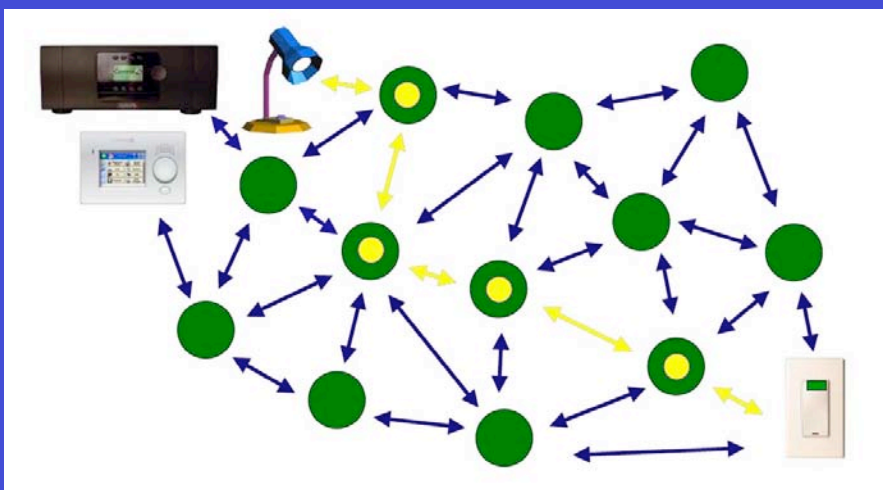




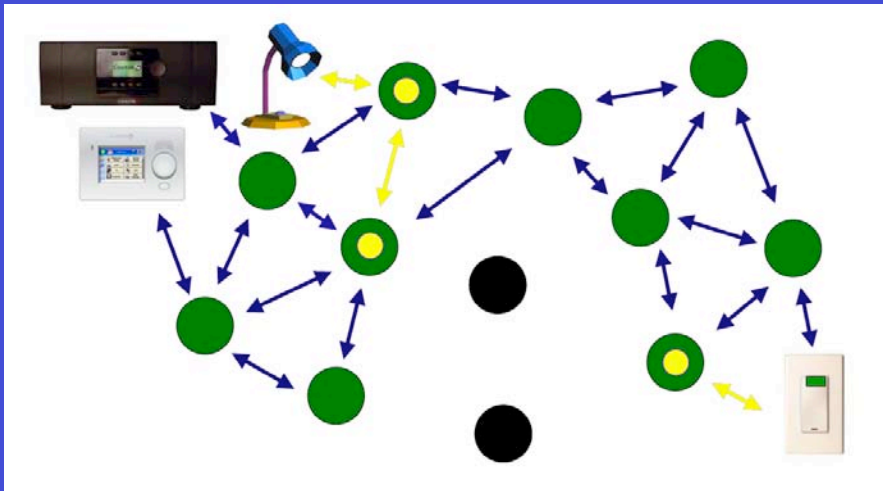
# ZigBee



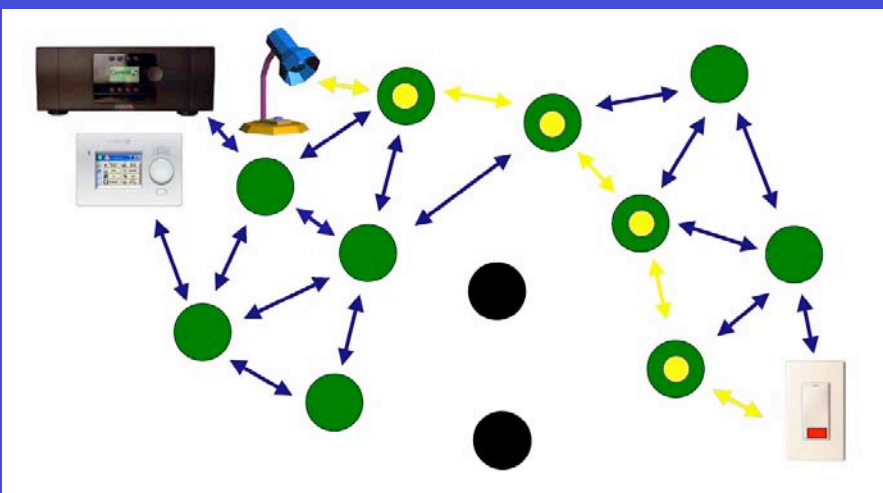
# ZigBee



## ZigBee



## ZigBee



## Key Partners



## ZigBee

- Standards based
- Low cost
- Can be used globally
- Reliable and self healing
- Supports large number of nodes
- Easy to deploy
- Very long battery life
- Secure
  
- Open Standards Enable Markets

Zigbee

[www.ZibBee.org](http://www.ZibBee.org)

## Self-Assessed Productivity and the Office Environment

Humphreys and Nicol

- Relation between environment and productivity is not simple.
- eg different kinds of task require different thermal body states for optimal performance.
  - Contemplative and imaginative tasks requiring relaxation may be helped by mildly warm body states
  - Analytical tasks requiring alertness and vigilance are sometimes better performed when the body state is slightly cool.
- Diversity of the recommendations made over the past 40 years is not surprising

## Self-Assessed Productivity and the Office Environment

Humphreys and Nicol

- Some kinds of manufacture, productivity has an obvious meaning—it is the rate of production
- Environment can affect work performance
- Cost of salaries typically far exceeds the capital and running cost of providing a workplace

## Good Workplace Environment

- **IF** the environmental variables directly affected productivity
  - necessary to argue for tightly specified and closely controlled thermal environments
  - probably necessitating central air-conditioning
  - only so could productivity be optimized and cost-effectiveness ensured

## However ....

- The productivity would depend upon whether the occupants were comfortable with their indoor environment
- Alternative strategies are therefore possible
- Sufficient individual control of the local workstation and is likely to enhance productivity
- Field studies - high levels of satisfaction with well designed, naturally ventilated or mixed-mode buildings

## And so ....

- If the occupants find these buildings comfortable, they will also enhance productivity??
- So maybe less prescriptive approaches would be also be cost-effective

A full list of the technical  
sessions can be seen at  
<http://www.ashrae.org/events/page/948>

Tales from across the sea....  
ASHRAE Dallas 2007

Eur Ing Tim Dwyer BSc(Hons) CEng MIMechE FCIBSE  
Department of Engineering Systems  
London South Bank University  
timdwyer@lsbu.ac.uk