The Texas Allergy, Indoor Environment and Energy Institute (TxAIRE)

Creating Solutions for a More Healthy and Energy Efficient World

Tyler Economic Development Council

21st Annual Meeting Presentation

By

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God Bless Texas

- America is Blessed
  (It is still the land of freedom, opportunity and American “Know-How”)
- Texas is Blessed (Land, Energy, Water, People, and Governance)
- Tyler is Blessed (Gateway into East Texas – the prettiest part of Texas!)
- Cotton, Cattle and Crude… then Computers,
  What’s next?
- I could argue, it’s about our Children, our Culture.
- Texas is still growing. Tyler will continue to grow.
- How do we sustain that growth and our quality of life?

The “Knowledge-Based” Economic Development Model

- “Economic Development” used to be synonymous with “Real Estate Development”.
- But you can’t just put up a sign and call it a “Tech Park”. Lot’s of places have plenty of land, cheap empty buildings, and local government tax incentives.
- The drivers for economic development today are:
    - Intellectual Property
    - A skilled and affordable workforce
    - Regional Identities and Branding
    - “Local” markets
    - And a “longview” (strategic vision)
- In simple language - How do we sell more stuff made in Tyler, to people outside of Tyler? Throughout Texas, across the U.S., around the World?

Growing Our Knowledge-Based Economy

- The Concept of TxAIRE started with the recognition that Tyler is the home of UT Tyler, the UT Health Science Center at Tyler, and major Trane, Carrier, and Lennox (Dallas) facilities.
- Indoor Environmental Quality (IEQ) is a key dimension of healthy and more energy efficient buildings and homes.
- That is projected to be a $60 Billion Dollar “new construction” and $240 Billion “renovation” market in the U.S. alone. (5x 2006 levels)
- Our unique capabilities (Research+Education+Health+Manufacturing) and our long (60 year) heritage and reputation in medical respiratory diagnosis and treatment define an important regional “industry cluster”.
- Today the world travels to Houston for cancer treatment.
- Tomorrow they will come to Tyler for respiratory illness prevention, diagnosis and treatment of their bodies AND their homes.

That’s the TxAIRE Vision. It can be a self-fulfilling prophecy.

WHY TxAIRE?

"It's not just about comfort"

And it's not just about allergies or even asthma anymore either. It's about heart attack, stroke, diabetes, cancer, neurological and reproductive development …

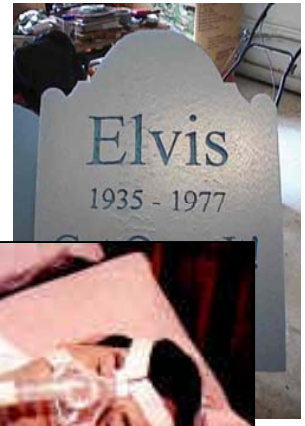
Odors

Sensory Irritation

Allergies

Asthma

Illness



Death

WHY TxAIRE?

Air Quality and Human Health

- 6 out of 10 (186 Million) people live where outdoor air quality levels are unhealthy. Asia and Eastern Europe are far worse.

- Worldwide outdoor air quality may decrease over coming decades.

- Buildings are supposed to protect us from “the elements”.

- Energy efficiency and IAQ need not be conflicting objectives.

- Intelligent buildings should be smart enough to know:

“when to breathe in and out and when to hold their breath”.

(a biomimicry technology statement)

WHY TxAIRE?

The Cost of Poor Air Quality

- Human Health related savings associated with the reduction in IAQ related illnesses offer a significant financial return on investment:
- Conservative estimates for U.S. IAQ illness related health care costs include:
  - Respiratory Disease: $6 to 16 Billion Dollars/year
  - Allergies and Asthma: $1 to 5 Billion Dollars/year
  - Sick Building Syndrome: $10 to 40 Billion Dollars/year

  TOTAL: $17 to 61 Billion Dollars/year
- Estimated 176 million "lost work" days and associated estimated 121 million "restricted work" days valued at approximately $34 Billion dollars per year for just common cold, influenza, pneumonia and bronchitis.

The economic value of human health improvements directly attributable to improved IAQ is extremely large – i.e. $50 to $95 Billion/Year.

From: Katz, et al. A Report to California's Sustainable Building Task Force.
Also see: IAQ Handbook, Ch 4 by W.J. Fisk (LBNL) entitled *Estimates of Potential Nationwide Productivity and Health Benefits from Better Indoor Environments.*

TxAIRE INITIATIVES

Five Examples Described

AIR QUALITY IMPACT UPON HUMAN HEALTH & PERFORMANCE

- Respiratory Illnesses
- Cardiovascular Impacts
- Neurological Development Impacts
- Unborn/Infant Child Risks
- Diabetes and Other Impacts
- Human Performance Impacts

IMPROVED BUILDING ENERGY EFFICIENCY

- High Performance Ventilation
- Sensing & Control
- High Efficiency Components
- Thermal Storage & Retrieval
- New Refrigerant Concepts
- The TxAIRE Home
- Smart Grid – Smart Building Interface

IAQ PRODUCT PERFORMANCE STANDARDS & REGULATIONS

- Indoor Air Quality Standards Development
- IAQ Educational Outreach
- Electronic Filter Testing Protocol Devel. (AHRI)
- IAQ Metrics & Indices Development
- Electronic Filter Testing (ASHRAE 52.2”E”)
- VOC Sensing/Removal Standards

IMPROVED INDOOR AIR QUALITY

- Electronic Particle Removal
- Gas Removal (M/S/VOC)
- Airborne Biological Removal
- Sensing & Control
- Air Enhancement Techniques

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The opinions of the speaker do not necessarily reflect those of the University of Texas at Tyler or those of any previous employer. (Hopefully they do.)