

Building efficiency

Opportunity & strategic policy needs

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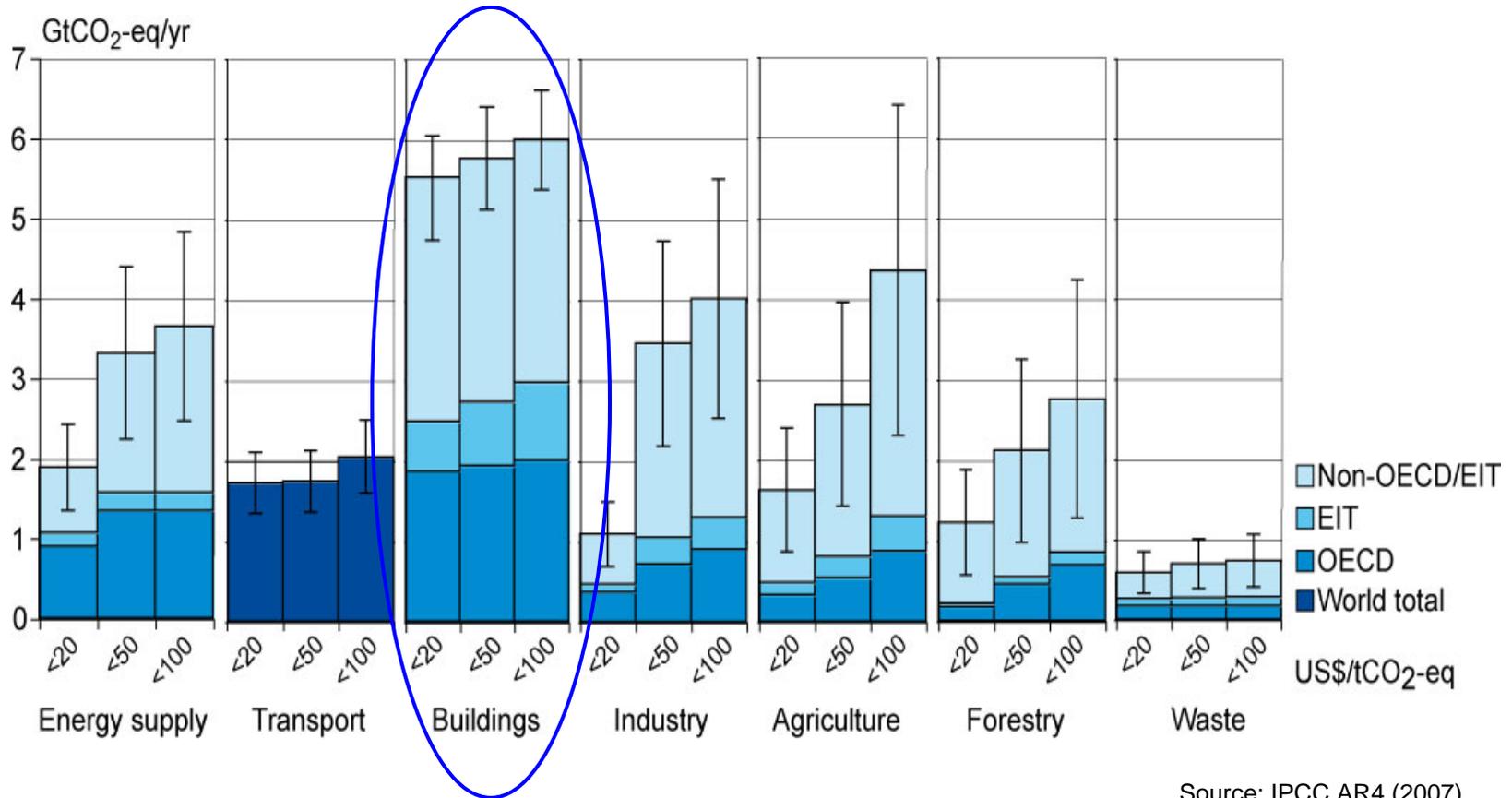
December 7, 2010

Ingersoll Rand – Who We Are

- We're a \$13 billion diversified industrial company
- Over 60,000 employees worldwide
- More than 100 manufacturing facilities worldwide
- Operations in every major geographic region
- Strategic brands are #1 or #2 in their markets

 TRANE	 HUSSMANN	 THERMO KING	 Club Car	 IR Ingersoll Rand	 SCHLAGE
#1 US #2 Worldwide Commercial HVAC Equipment	#1 North America display cases #1 North America service provider	#1 Worldwide transport refrigeration	#1 Worldwide golf cars	#1 North America air compressors, air tools	#1 North America lock and door hardware

Buildings: Largest GHG emissions sector



Source: IPCC AR4 (2007)

India Case Study:

Le Meridian Hotel retrofit

- 25 year old Bangalore landmark hotel
- Owner faced multiple issues:
 - Rising energy costs
 - Increasing service costs
 - Downtime and unacceptable noise levels
- Site survey led to energy analysis led to proposal
- Final action: Turnkey HVAC retrofit with building management system installation including predictive maintenance reporting feature

So...what were the quantified results?

- US\$85,000 annual energy cost savings
- Noise level reduction of 40%
- Service cost reduction of 30%

- Guest comfort improved considerably
 - noise, downtime improvements

- **NOTE: Multiple interests go beyond energy efficiency**

Financial benefits drove investment that delivered environmental benefits
What can we learn from this?

Summary leading to policy considerations

- Buildings → largest GHG emissions sector
- Many buildings → focus on enabling *process*
- Owner investments → Financially driven with environmental benefits also
- New construction is important, but existing buildings represent vast majority of the problem/opportunity
- Existing buildings:
 - Older technology AND not well maintained
- Investment in energy efficiency also creates benefits in comfort and safety

So...how do we accelerate building owner investment for energy efficient technology

Answer: Multiple complementary measures drive action beyond what any single approach can do

- Standards/codes development drive minimums up
 - Existing buildings and new construction
- Customer incentives create incremental investment that meet all stakeholder interests
 - Existing buildings and new construction
- Awareness programs tie together standards development and consumer incentives
 - Existing buildings and new construction

Can we really do this?

Singapore & India

- Singapore:
 - Green Building standard mandate combined with monitoring technology incentives drive minimums while proving results
- India:
 - Chlorofluorocarbon chiller replacement
 - Ozone depleting substance and potent GHG
 - Energy efficiency
 - 20% cash rebate OR CDM revenue benefit
 - World Bank led initiative

Many benefits: energy reductions, jobs creation, building owner financial benefits, GHG emissions reductions, comfort improvement, etc

In summary

- Climate change cannot be solved without addressing buildings
- Building owners driven by financial interests
- Financial investments lead to environmental benefits
- Technology exists...today
- Technology does NOT need to be transferred
 - Industry WILL invest when enabling environments AND acceptable market/demand exist
- Complementary policy measures (mandates, incentives, awareness building) CAN work

Business is ready to move forward aggressively