

# Buildings and Climate Change: Local Solutions to a Global Problem

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# Legislative Goals-Guess What Year?

- ◆ “large amounts of fuel and energy are consumed unnecessarily... newly constructed residential and commercial buildings lack adequate energy conservation features”
- ◆ “urgent need to promote the design, construction and operation of buildings to conserve and make more efficient use of fuels and energy ”

# The Lost Opportunity

- ◆ Energy Conservation Standards for New Buildings Act of 1976
  - mandatory standards for residential and commercial buildings
  - no federal financial assistance unless local government meets standards
- ◆ Energy Conservation in Existing Buildings Act of 1976
  - weatherization standards
  - financial assistance for existing building energy conservation

# Lost Opportunity Cont'd

- ◆ National Energy Conservation Policy Act of 1978 (NECPA)
  - DOE to issue mandatory state residential energy conservation plans
  - energy audits phased in beginning with buildings >30,000 sq2
  - retrofit federal buildings by 1/1/90
  - federal leasing preference to buildings using renewable resources

# Lost Opportunity, Cont'd.

- ◆ Solar Energy and Energy Conservation Act of 1980
  - prototype residential energy standards for existing buildings
  - mandatory energy conservation measures for commercial and residential buildings in state energy plans
- ◆ Omnibus Budget Reconciliation Act of 1981
  - eliminates mandatory requirements

# What Happened After 1980?

- ◆ GHG emissions increase annually 2%
- ◆ Commercial building GHG emissions grow 2.5% annually
- ◆ Residential Buildings increase GHG emissions 1.7% annually

# Building Environmental Impacts

- ◆ 39% of GHG Emissions
  - 49% of SO<sub>2</sub>
  - 25% of NO<sub>x</sub>
  - 7% methane (C/D, fireplaces, stoves)
- ◆ 70% of Electricity Consumption
- ◆ 39% of Energy Use
- ◆ 58% building end-use energy from on-site fuels

# Building Impact Cont'd

- ◆ Residential

- 30% residential space heating

- ◆ Commercial

- 21% lighting

- 12% space heating

- 9% a/c

- balance for water heating, refrigeration



# Paltry Improvement in last twenty years

- ◆ State Energy Efficiency Programs Improvement Act of 1990
  - state energy conservation programs goal of 10% improvement by 2000 over 1990
- ◆ Energy Policy Act of 1992
  - states to amend codes to meet or exceed model energy codes
  - federal building standards to meet or exceed model energy codes

# Paltry Efforts in this Decade

- ◆ The Energy Policy Act of 2005
  - reduce energy consumption of federal buildings by 20% by 2015
  - federal performance standards (30% efficiency)
  - State energy Codes 25% improvement by 2012 over 1990.
- ◆ Consensus Standards are Bare Minimum of What Is Achievable
- ◆ CAA and CWA were Technology-Forcing Laws!

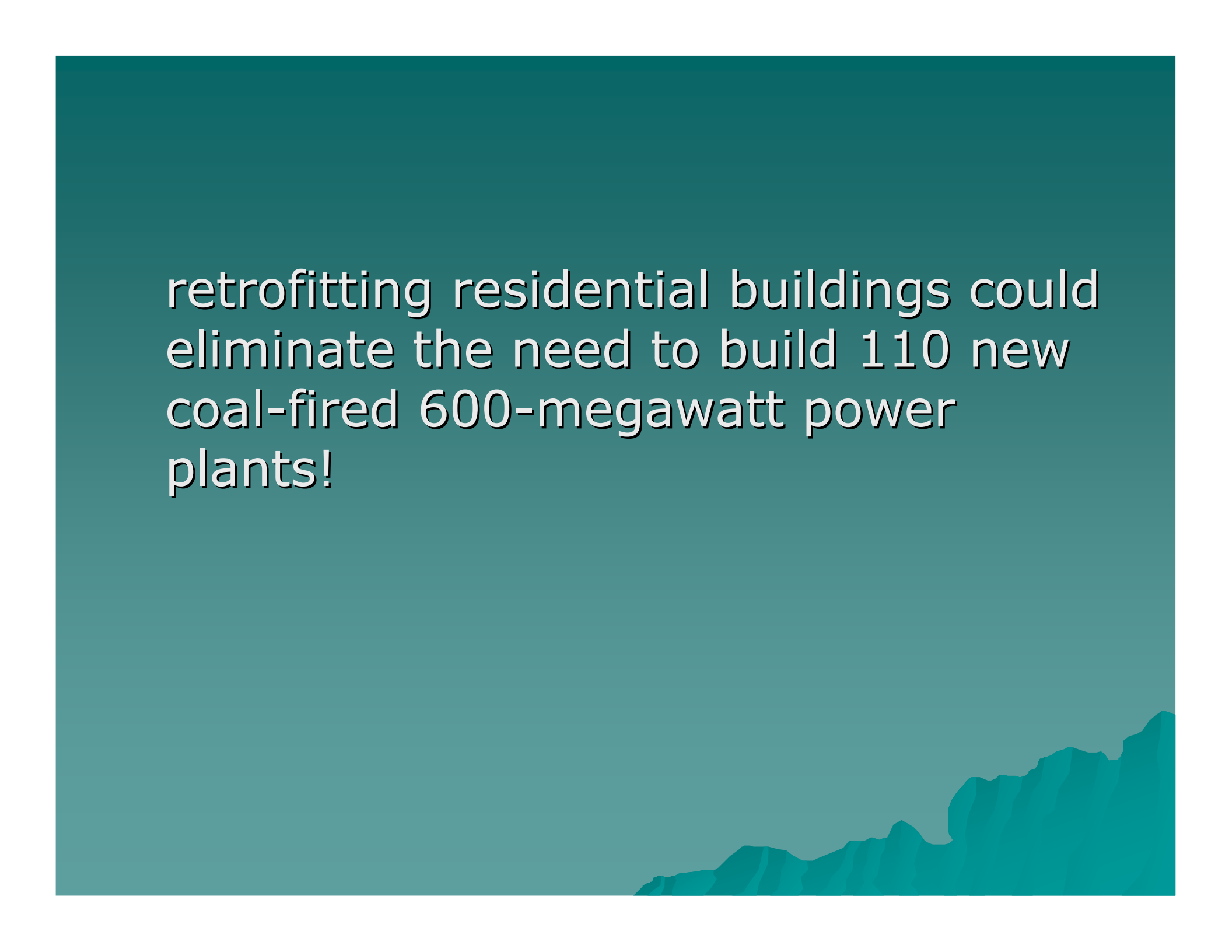
# Building Stock

- ◆ 5 billion sf new construction
- ◆ 5 billion sf renovation
- ◆ 95% Commercial Buildings <50K SF
- ◆ Half of building stock will be existing buildings in 2050
- ◆ NYC-85% of buildings in 2030 will be existing buildings

# IPCC Climate Change 2007

- ◆ “Buildings offer the largest share of cost-effective opportunities for GHG mitigation”
- ◆ “Achieving a lower carbon future will require very significant efforts to enhance programmes and policies for energy efficiency in buildings well beyond what is happening today”

retrofitting residential buildings could  
eliminate the need to build 110 new  
coal-fired 600-megawatt power  
plants!

The background is a solid teal color. At the bottom of the image, there is a silhouette of a mountain range in a slightly darker shade of teal.

# Local Green Building Initiatives

- ◆ U.S. Mayors Climate Protection Agreement (839 cities)
  - GHG emissions below 1990 levels
- ◆ 115 Cities with Green Building Programs
  - Primarily LEED or GreenGlobe
- ◆ Growing Faster Than ACM or ADA
- ◆ 58% of population subject to GHG regulation

# Local Initiatives Cont'd

- ◆ Ordinances, Guidance, Regulations
- ◆ Building Code
- ◆ Energy Code
- ◆ Zoning
- ◆ Planned Development Communities (CC&R)

# Types of Green Building Programs

- ◆ Mandatory)
- ◆ Expedited Reviews Financial Incentives
- ◆ Financial



# Mandatory

- ◆ Varies
  - Size (SF, height, units)
  - single or multi-family, commercial
  - geographic zones
- ◆ Phase-in by property type and rating
- ◆ Minimum and higher levels for larger projects

# Local Program Structures

- ◆ Optional and required
- ◆ modified rating system
  - minimum points,
  - specific environmental issues
- ◆ modify third party certification
- ◆ Real Estate Disclosure/Transfer

# Documentation

- ◆ **checklist/scorecard with own required green materials**
- ◆ **USGBC registration**
- ◆ **Green Building Professional**
- ◆ **Timing**
  - detailed planning, pre-permitting review
  - additional reports during construction
  - updated checklist with materials specs,
  - commissioning plans, energy modeling
- ◆ **Inspections/Self-Certification/TP Verification**
  - foundation/framing/other measures
  - Post-construction
- ◆ **Post-Occupancy Benefits**

# Local Enforcement

- ◆ Stop Work Orders
- ◆ Require Substitution of Materials
- ◆ Withhold/Revoke Approvals
  - Compliance prior to COO
  - TCO Subject to Certification
- ◆ Penalties/Reimburse Waived Fees
- ◆ Bond Forfeiture
- ◆ Prohibit Future Participation

# Incentive Programs

- ◆ Expedited Permitting For Non-Discretionary Entitlements
  - Pre-review
  - expedited review for certain levels
  - specialized staff
  - interagency coordination
- ◆ Bonus Density
  - Floor Area Ratios
  - Height
  - landscaping (green roof credit)

# Local Financial Incentives

- ◆ **May Be Tiered based on rating level**
- ◆ **State or Local Tax Credits or Abatements**
  - Income Tax for Owners and Tenants
  - Property Tax Abatement or Exemption
  - Multi-Purpose Tax (Corporate, income, etc)
  - Timing on when to submit exemption
- ◆ **Fee Waiver or Rebates**
- ◆ **Partial or Full Reimburse TP Fees**
- ◆ **Utility rebates**
- ◆ **Grants/Loans**
- ◆ **Leasing Assistance**
- ◆ **Technical Assistance (no TP certification)**
- ◆ **Public Recognition**

# Washington, DC

- ◆ Green Building Act of 2006
- ◆ Applies to public buildings in 2008  
>10K SF achieve 75 EPA Energy performance rating points and LEED Silver
- ◆ New Private Construction in 2012  
>50k SF

# Boston

- ◆ zoning code
- ◆ New and Renovations >50 SF must earn LEED certification or specific credits involving transportation, energy, groundwater recharge



# Los Angeles

- ◆ New Non-Residential 50K SF
- ◆ New Mixed Use or residential
  - >six stories and gross floor area of 50K SF
  - <six Stories with 50 dwelling units or 80% residential FAR
- ◆ Alteration or rehab of existing buildings with 50K SF and costs >50% of replacement value
- ◆ Alteration of 50 dwelling units with at least 50 SF FAR and >50% of replacement cost
- ◆ Considering reduce threshold to 25K SF

# San Francisco

- ◆ New Commercial Buildings >5K SF
- ◆ renovations of existing buildings >25K SF
- ◆ Residential Buildings taller than 75 Ft

# NYC

- ◆ Local Law 86
  - City-Owned Buildings
  - Private-Owned Buildings Funded from City Budget

# Barriers to Implementing Efficiency Standards

- ◆ High Cost of Obtaining Reliable Information on efficiency measures
- ◆ Leases Disincentives
  - LL pays for installations and equipment
  - T pays for energy costs
- ◆ Fragmentation of Building Industry
- ◆ No Ongoing Monitoring-buildings lose efficiency
- ◆ Inadequate financing

# Some Legal Issues

- ◆ **What Standard (specific, revised?)**
- ◆ **Who Bears Risk (tenant, owner, professional)?**
- ◆ **Lease Issues (level, allocation, expense language, other tenants)**
- ◆ **What is a Failure?**
  - loss of funding
  - fail to obtain certification
  - lost tenant
- ◆ **Breach of Green Covenant**
- ◆ **What is Material Breach**
- ◆ **LEED Appeals**

# Federal Regulation of GHG Emissions

- ◆ Massachusetts v. EPA
- ◆ Clean Air Act
- ◆ ANPRM

# Clean Air Act-NAAQS

- ◆ NAAQS Health-based
- ◆ Attainment or Non-Attainment
- ◆ SIP
  - transportation conformity for roads, bridges, airports, ports and transit lines
  - RACT/RACM for existing sources

# CAA-NSPS (§111)

- ◆ emission standards for new or modified sources require BDT
- ◆ Not limited to criteria pollutants but applies to all emitted by the NSPS category
- ◆ State must apply existing sources
- ◆ Could trigger PSD and Title V



# PSD

- ◆ 100/250 tpy thresholds to GHG could trigger BACT
  - 2.4 million commercial non-mall buildings use natural gas
  - 54% <5K sq ft
  - CO2 Emissions of 21 metric tons
  - Pre-construction review for large office and multi-family buildings, hotels, large retail buildings, hospitals, schools
- ◆ Friends of the Chattahoochee, Inc. and Sierra Club v. Couch

# NSR

- ◆ new and modified sources (100 tpy)
- ◆ Lowest Achievable Emission Rate (LAER)
  - forced to use more efficient boiler/furnace
- ◆ major modification
  - PTE could cause small natural gas furnace for space heating to trigger NSR
  - set thermostat at level that requires furnace to operate 24/7?
  - shift to electric space heat?
  - federally enforceable limits under Title V permit?

# NESHAP

- ◆ 10 tons for single or 25 tons for combination of HAPs
- ◆ MACT
- ◆ Buildings with natural gas furnaces and single-family home with gas appliances

# Title V

- ◆ 550,000 additional sources compared to current 15-16,000
  - major source
  - Source subject to NSPS
  - area sources for HAPs
  - PSD/NSR

# Indirect Source Review challenges

- ◆ 1974 (39 FR 30440)-
  - 1000 parking spaces or 250 with serious auto emission
- ◆ San Joaquin Valley Air Pollution Control District
  - 50 or more homes
  - mitigation fee or design to reduce NO<sub>x</sub>/PM

# NEPA actions

- ◆ 1997 Draft Guidance
- ◆ FOE v. Mosbacher
- ◆ Border Power Plant Working Group v. DOE
- ◆ Mayo Foundation v. Surface Transp. Bd
- ◆ Montana Environmental Information Center v. Johanns

# State Environmental Review Laws

- ◆ Massachusetts Environmental Policy Act
  - EOEEA Greenhouse Gas Emissions Policy
  - Kyoto GHGs
  - Direct and Indirect Emissions
- ◆ California Environmental Quality Act
  - Center for Biological Diversity vs. City of Desert Hot Springs
  - Center for Biological Diversity vs. San Bernardino County
  - Center for Biological Diversity v. City of Perris