# ASTM Building Energy Performance Assessment (BEPA) Standard

ASTM STANDARD E 2797-11

# Overview

❖ Regulatory and Business Driving Forces

❖ Industry Gaps

❖ ASTM Standardization

❖ BEPA Components

❖ Use of BEPA results

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# Regulatory Driving Factors

❖ Building Energy use data

- Collection
- Compilation
- Analysis

❖ Benchmarking against peers

❖ Disclosure to prospective:

- Purchaser
- Lender
- Tenants
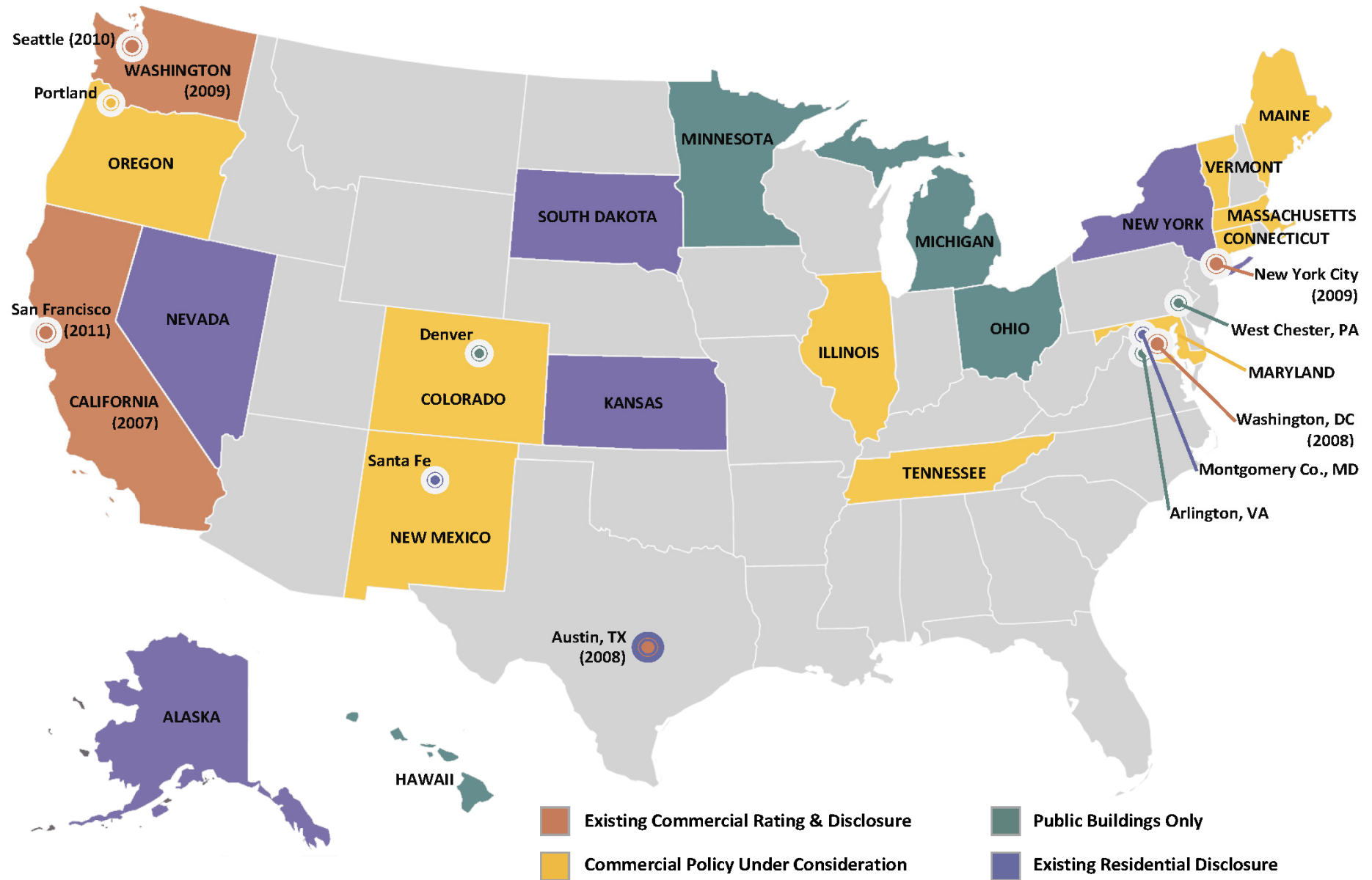
❖ Public Buildings

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# Regulatory Driving Factors, cont'd

- ❖ Energy Performance Disclosure in EU (2003, effective 2009)

- ❖ California AB 1103 (2007, effective 2011)

- ❖ District of Columbia (2008, effective 2010)

- ❖ Austin, Texas (2008, effective 2011)

- ❖ Washington State (2009, effective 2011)

- ❖ Seattle, Washington (2010, effective 2011)

- ❖ New York City, NY (2009, effective 2011)

- ❖ Other Cities/States considering and Federal Legislation being discussed

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# U.S. Building Rating and Disclosure Policies

IMT — Institute for Market Transformation

BuildingRating.org — sharing *transparency*

For more information, please contact Caroline Keicher, Institute for Market Transformation at (202) 525-2883, caroline@imt.org
To access this document online, see www.imt.org/rating or www.buildingrating.org

Seattle (2010)

WASHINGTON (2009)

Portland

OREGON

San Francisco (2011)

NEVADA

Denver

COLORADO

CALIFORNIA (2007)

Santa Fe

NEW MEXICO

MINNESOTA

SOUTH DAKOTA

MICHIGAN

KANSAS

ILLINOIS

OHIO

TENNESSEE

MAINE

VERMONT

NEW YORK

MASSACHUSETTS
CONNECTICUT

New York City (2009)

West Chester, PA

MARYLAND

Washington, DC (2008)

Montgomery Co., MD

Arlington, VA

Austin, TX (2008)

ALASKA

HAWAII

**Existing Commercial Rating & Disclosure**

**Commercial Policy Under Consideration**

**Public Buildings Only**

**Existing Residential Disclosure**

# Business Driving Factors

❖ High Energy Use buildings may be less competitive in the marketplace and result in need for a rental "discount" that can impact a building's pro forma provided to the lender for financing

❖ Buildings with poor energy performance may be viewed as less valuable, particularly as "green" building initiatives/trends proliferate throughout the country

❖ Poor building energy performance may reduce the prospective tenant pool as tenants implement their own energy use/carbon footprint evaluations and improvements

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# Business Driving Factors, cont'd

❖ New energy efficiency requirements in building codes
   (typically applicable to major renovations in existing
   buildings as well) can impact the capital needs identified in a
   PCA

❖ A building's potential carbon footprint may impact a
   prospective purchaser wanting to be "carbon neutral" since
   additional off-sets would have to be acquired (at a cost) to
   offset net building energy consumption for poorer performing
   buildings

❖ More energy efficient buildings are have:
   - Lower operating costs
   - Higher net operating income
   - More valuable
   - More attractive to tenants

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# Industry Gaps

❖ Prospective Purchasers/tenants, as part of due diligence, are asking what is the building's energy consumption

❖ No "standard" existed to forecast energy consumption

❖ Pro forma provided to lenders has a line item for utilities under building operating costs and lenders what a "reasonable" and "realistic" value

# Industry Gaps, cont'd

❖ Energy use numbers are collected/reported with little understanding of what they mean/include

❖ Numerous "guides" exist for collecting data, but little consistency in methodology with regards to:

- Time period of data collection
- Use of building occupancy as a factor
- Use of weather conditions as a factor
- Use of building operating hours as a factor
- If major renovations were considered (or defined)
- Who is qualified to collect/analyze data

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# ASTM Standard E 2797-11

❖ Standardizes collection and reporting of energy consumption information associated with a building involved in a real estate transaction

❖ Will complement current green building initiatives

- USGBC LEED building rating and certification system
- CMP – Capital Markets Partnership (green value scoring for buildings)
- EPA Energy Star (building labeling)
- ASHRAE Standards (90.1; proposed 189.1 for green buildings; and building energy labeling)

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# ASTM Standard E 2797-11, cont'd

❖ Methodology to conduct a Building Energy Performance Assessment (BEPA)

❖ Reporting of the information in a manner such that the prospective purchaser understands precisely what is being reported including all conditions and limitations

❖ "Building Energy Performance Assessment (BEPA) is a process involving the collection, compilation, review and analysis of building energy use and cost information to indentify representative values for reporting to clients and other interested parties"

# ASTM Standard E 2797-11, cont'd

❖ New Terms Defined

- Major Renovation - A renovation involving expansion (or reduction) of a building's gross floor area by 10% or more, or any renovation impacting total building energy use by more than 10%

- Energy Use Range - Reasonable upper and lower limit energy use at the building, determined by use of 75th and 25th percentile values for independent variables impacting a building's energy use

- Pro Forma Building Energy Use - Representative annual building energy use intensity – designed to reduce the influence of biases such as unusual weather conditions or building operating conditions

- Pro Forma Energy Cost - Representative average annual building energy cost - designed to reduce the influence of biases such as unusual weather conditions or building operating conditions

# ASTM Standard E 2797-11, cont'd

❖ "Standardization"

- Data collection time period – "3 years or last major renovation, with minimum of 1 year"

- Major Renovation definition

- Consistent energy use data – monthly average normalized for calendar month

- Energy metrics, e.g., energy use intensity in kBtu/SF-yr

- Energy Use normalization parameters (weather, occupancy, etc.)

# ASTM Standard E 2797-11, cont'd

- Defines building energy use equation
  - — Relates energy use (dependent variable) to independent variables with known variability (e.g., HDD, CDD, occupancy, operating hours, etc.)
- Pro Forma Building Energy Use defined by using average independent variables to determine energy use intensity
- Pro Forma Building Energy Cost defined using actual trailing 12 months energy costs to determine a building energy cost multiplier
- Appropriate Range for building energy use/cost
  - — 25th and 75th percentiles for independent variables

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# ASTM Standard E 2797-11, cont'd

- Deliverable
  - —Pro forma building energy use and energy cost
  - —Upper and lower range for building energy use and energy cost
  - —Actual building energy use and energy cost (raw data) for each year the data was collected
  - —Standardized deliverable for use in pro forma submitted to lender for financing (pro forma building energy cost)

# BEPA Components

- ❖ Site Visit

- ❖ Interviews

- ❖ Records Collection

- ❖ Records Review and Analysis

- ❖ Report

# BEPA Components

❖ Site Visit

- Confirm Building Characteristics and Major Components
- Records Collection
- Interviews
- Walk-through
- Verify information (review beforehand as much as possible)
- Fill gaps

# BEPA Components

❖ Interviews

- General Building Characteristics
- Major Building Components
- Building's operational history/renovations
- Questions to fill any data gaps

# BEPA Components

❖ Records Collection

- Building construction data

- Building operating data

- Building energy consumption and cost data (previous 3 years or to last renovation)

- Local weather data (HDD and CDD)

- Any other available information (audits/maintenance records)

# BEPA Components

❖ Records Analysis

- Data conversion/normalization

- Develop building energy use equation

- Determination of appropriate building site
  energy consumption metrics

- Determine building energy consumption
  range (upper and lower limits) and cost
  range (current cost data)

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# BEPA Components

❖ Report Deliverables

- Pro forma building energy performance

- Pro forma building energy cost

- Range of building energy use and cost under lower, upper, average case scenarios

- Actual building energy use and cost data for each year

# Non-Scope Considerations

- ❖ Benchmarking building energy performance against peer buildings in the local market or internal portfolio

- ❖ Building energy performance labeling (e.g., Energy Star, ASHRAE)

- ❖ Recommendations for energy conservation measures

- ❖ "Green Building" performance attributes

- ❖ Greenhouse Gas emission calculations

# Use of BEPAs

❖ Commercial Real Estate Transactions/ Due
Diligence/Disclosure Regs

- BEPA
- BEPA + Benchmarking
- BEPA + Level I Energy Audit

❖ Asset Management

- BEPA + Level I/II Energy Audits

❖ Energy Efficiency Improvement Lending

- Financing energy retrofits
- BEPA + Level I/II Energy Audit

❖ Portfolio Management

- Assign capital improvement budgets for energy initiatives
- BEPA + Benchmarking

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# Use of BEPAs

❖ BEPA is tool for initial screening/evaluation

❖ Can lead to:

- Energy Audits
- Investment Analysis
- System Engineering & Design
- System Installation & Verification
- Building Monitoring and Optimization

# Questions?

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