



The Parker Ranch installation in Hawaii

Stretch Codes

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1. Discussion of Technical Assistance Program (TAP)

- What is TAP?
- What does TAP Provide?
- TAP Resources

2. Discussion of Stretch Codes

- General Discussion on Stretch Code
- Discussion on Massachusetts Stretch Code
- Alternative Versions of Stretch Code (Green Codes)

What is TAP?

DOE's Technical Assistance Program (TAP) supports the Energy Efficiency and Conservation Block Grant Program (EECBG) and the State Energy Program (SEP) by providing state, local, and tribal officials the tools and resources needed to implement successful and sustainable clean energy programs.



TAP offers:

- One-on-one assistance
- Extensive online resource library, including:
 - Webinars
 - Events calendar
 - TAP Blog
 - Best practices and project resources
- Facilitation of peer exchange

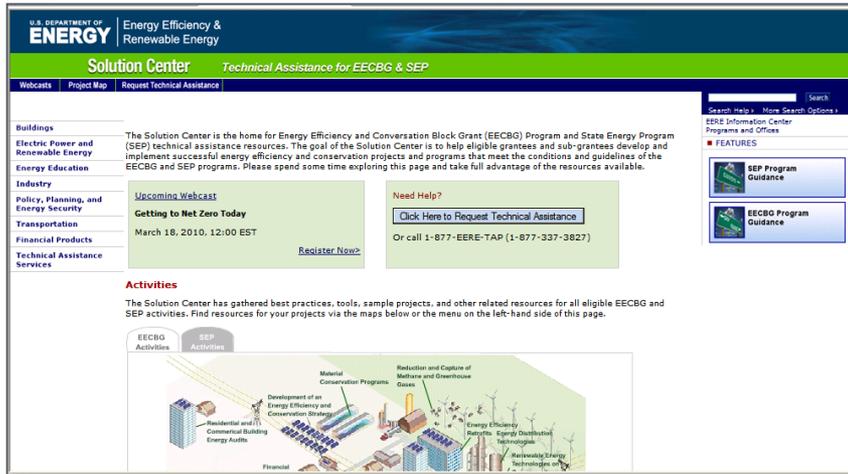
On topics including:

- State and local capacity building
- Energy efficiency and renewable energy technologies
- Program design and implementation
- Financing
- Performance contracting

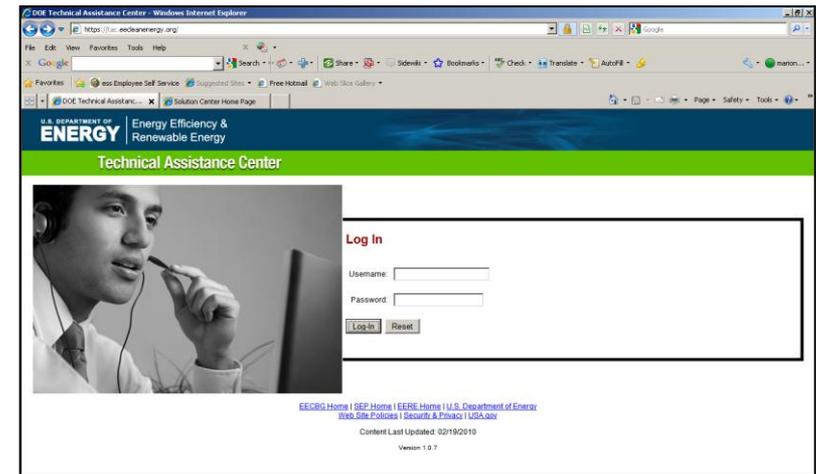
We encourage you to:

1) Explore our online resources via the [Solution Center](#)

2) Submit a request via the [Technical Assistance Center](#)



The screenshot shows the 'Solution Center' website for the U.S. Department of Energy. The header includes the DOE logo and 'Energy Efficiency & Renewable Energy'. Below the header, there are navigation tabs for 'Webcasts', 'Project Map', and 'Request Technical Assistance'. The main content area is divided into several sections: 'Buildings' with a description of the Solution Center's purpose; 'Energy Education' with a link to 'Upcoming Webcast' for 'Getting to Net Zero Today' on March 18, 2010; 'Industry' with a 'Need Help?' section and a 'Click Here to Request Technical Assistance' button; and 'Activities' with a description and a diagram showing various energy efficiency and conservation strategies like 'Material Conservation Programs', 'Reduction and Capture of Methane and Greenhouse Gases', and 'Energy Efficient Networks, Energy Distribution, and Emerging Energy Technologies'.



The screenshot shows the 'Technical Assistance Center' website in a Windows Internet Explorer browser window. The header features the DOE logo and 'Energy Efficiency & Renewable Energy'. The main content area has a 'Log In' section with fields for 'Username' and 'Password', and 'Log In' and 'Reset' buttons. Below the login section, there are links for 'EECBG Home', 'SEP Home', 'EERE Home', 'U.S. Department of Energy', 'Web Site Policies', 'Security & Privacy', and 'USA.gov'. The footer indicates 'Content Last Updated: 02/19/2010' and 'Version: 1.0.7'.

3) Ask questions via our call center at 1-877-337-3827 or email us at solutioncenter@ee.doe.gov

Please join us again:

Title: **Stretch/Reach Codes**

Host: Isaac Elnecave, Midwest Energy Efficiency Alliance

Date: September 15, 2010

Time: 2:00 – 3:00 EDT

Title: **Loan Loss Reserves: Lessons from the Field**

Host: Merrian Fuller, Lawrence Berkley National Laboratory

Date: September 20, 2010

Time: 2:00 – 3:15 EDT

Title: **Taking Advantage of Qualified Energy Conservation Bonds (QECBs)**

Host: Mark Zimring, Lawrence Berkley National Laboratory

Date: September 22, 2010

Time: 3:00 – 4:30 EDT

Title: **Energy Saving Performance Contracting (ESPC) Basics**

Host: Meg Giuliano, ICF International

Date: September 23, 2010

Time: 1:30 – 2:30 EDT

Title: **“Green” Codes and Programs**

Host: J.C. Martel, Southwest Energy Efficiency Alliance

Date: September 24, 2010

Time: 2:00 – 3:00 EDT

Title: **Designing Effective Renewables Programs**

Host: Cheryl Jenkins, Vermont Energy Investment Corporation

Date: September 28, 2010

Time: 2:00 – 3:00 EDT

Title: **Driving Demand for Home Energy Improvements: Lessons from the Field**

Host: Sarah Busche, National Renewable Energy Laboratory

Date: September 29, 2010

Time: 3:00 – 4:15 EDT

For the most up-to-date information and registration links, please visit the Solution Center webcast page at www.wip.energy.gov/solutioncenter/webcasts

General Discussion on Stretch Codes

- Stretch Code (or Above Code or Reach Code):
 - Code that results in more energy efficient buildings on average than the locally enforced energy code.
 - The locally enforced code can be the national model codes (either the International Energy Conservation Code or ASHRAE 90.1) or state codes that differ from the national model such as in California, Oregon or Washington.

- Desire by communities to go to more energy efficient codes
- State incentives
- Provide guidance for future energy codes
- Opportunity to train the building and development community in advanced building practices

- Must generate more energy savings than locally enforced code (on average)
- Reach Code must be “buildable”
- Reach Code must be enforceable
- Designed to become the regular code in subsequent code adoption cycles
- Can design training and enforcement protocols for it

- Help building professionals learn new tools and techniques that achieve greater energy efficiency.
- Shows that energy efficient construction can be done.
- Provides incentive to constantly update energy efficiency programs for new construction.
- Guide the way to Net-Zero Energy Buildings

- State law can allow local jurisdictions to adopt reach code (often under restrictive conditions)
- If state law prohibits local jurisdictions from adopting code other than state code (“min-max provision”):
 - Incorporate Stretch Code as “Informative Appendix”
 - Tie to Energy Efficiency Programs
 - Tie to Public Building Construction Policies
 - Provide Guidance to Building Community

- Massachusetts Stretch Code (Section 780 CMR 120.AA)
- ASHRAE Standard 189.1
- California Green Standards Code (CALGreen)*

* Note that CALGreen and 189.1 are “green” codes that not only incorporate energy efficiency but include several other sections such as water efficiency.

** The International Green Construction Code being developed by the International Code Council is still under construction and should be complete by November 2010.

- Green Building Rating Systems such as LEED or the National Association of Home Builders National Green Building Standard are **not** appropriate as stretch codes
- Energy Codes (including stretch codes) set the floor on energy efficient design and construction (worst home that legally can be built)
- Rating systems raise ceiling on green (including energy efficient) design and construction

Massachusetts Stretch Code

- Developed in response to call from towns and cities for a stretch code
- Original proposal included several options – overwhelm with alternatives
- State eventually settled on one residential and one commercial option (avoid having a multiplicity of stretch codes across the state)
- Board of Building Regulations and Standards designed training for both the regular state code and the stretch code.

- HERS Rating of 65 or 70 (Depending on Size of Home)
- Roughly 15% to 20% more energy efficient than 2009 IECC.
- Such a home would include:
 - Significantly lower air infiltration (almost twice the current code)
 - Significantly tighter ducts (4 times less leakage than current code)
 - Likely addition of mechanical ventilation system.
 - Use of high efficiency water heaters such as instantaneous tankless units as well as High Efficiency Heating and Cooling Equipment

- Commercial stretch code prescriptive path is based on New Buildings Institute Core Performance Guide (CPG) and follows IECC formatting and section numbers.
- Used CPG because building community had experience with it. Used in new construction energy efficiency program.
- Compliance achieved by demonstrating 20% less energy usage than ASHRAE 90.1 – 2007, either by prescriptive or performance approach.

- Prescriptive section of code applies to
 - Building between 5,000 and 100,000 square feet
 - Additions Greater than or Equal to 30% of the conditioned floor area
- Performance section of code applies to:
 - Buildings greater than 100,000 square feet
 - Additions greater than or equal to 30% of conditioned floor area in buildings greater than 100,000 square feet

Prescriptive Requirements That Go Beyond the ASHRAE 90.1-2007

- More stringent opaque envelope
- More stringent window efficiency
- More stringent window sealing
- More detailed commissioning requirements

120.AA Requirements not found in ASHRAE 90.1-2007

- HVAC Trade-Off
- Adds possibility of using renewable energy
- Addition of air barrier
- Additional Lighting Controls
- *Design Intent* (Not in 120.AA but important component of stretch codes)

- Design intent section designed to require those involved in the project to think through the design process prior to actually starting design.
- Particularly useful for large complex buildings.
- Includes requirement to lay out:
 - Performance objectives
 - Building orientation and how it effects energy use
 - Discussion of HVAC strategy including load sizing
 - Discussion of elements designed to take building beyond minimum efficiency requirements

- The building envelope shall be designed and constructed with a continuous air barrier between conditioned and unconditioned spaces.
- Air Barrier
 - Be continuous
 - Maximum air permeability
 - Must be maintainable or at least meet durability requirements
 - Capable of withstanding positive and negative pressures
 - Joined and sealed in a flexible manner.

DURING CONSTRUCTION PROCESS

- Commissioning Plan
- Systems Balancing/Adjustment
- Equipment Performance Tests
- Controls Performance Tests
- Preliminary Report
- Acceptance of Reports

POST-CERTIFICATE OF OCCUPANCY

- As-Built Drawings
- Equipment Service Manuals
- Final Balance Report
- Final Commissioning Report
- Deferred Testing Report

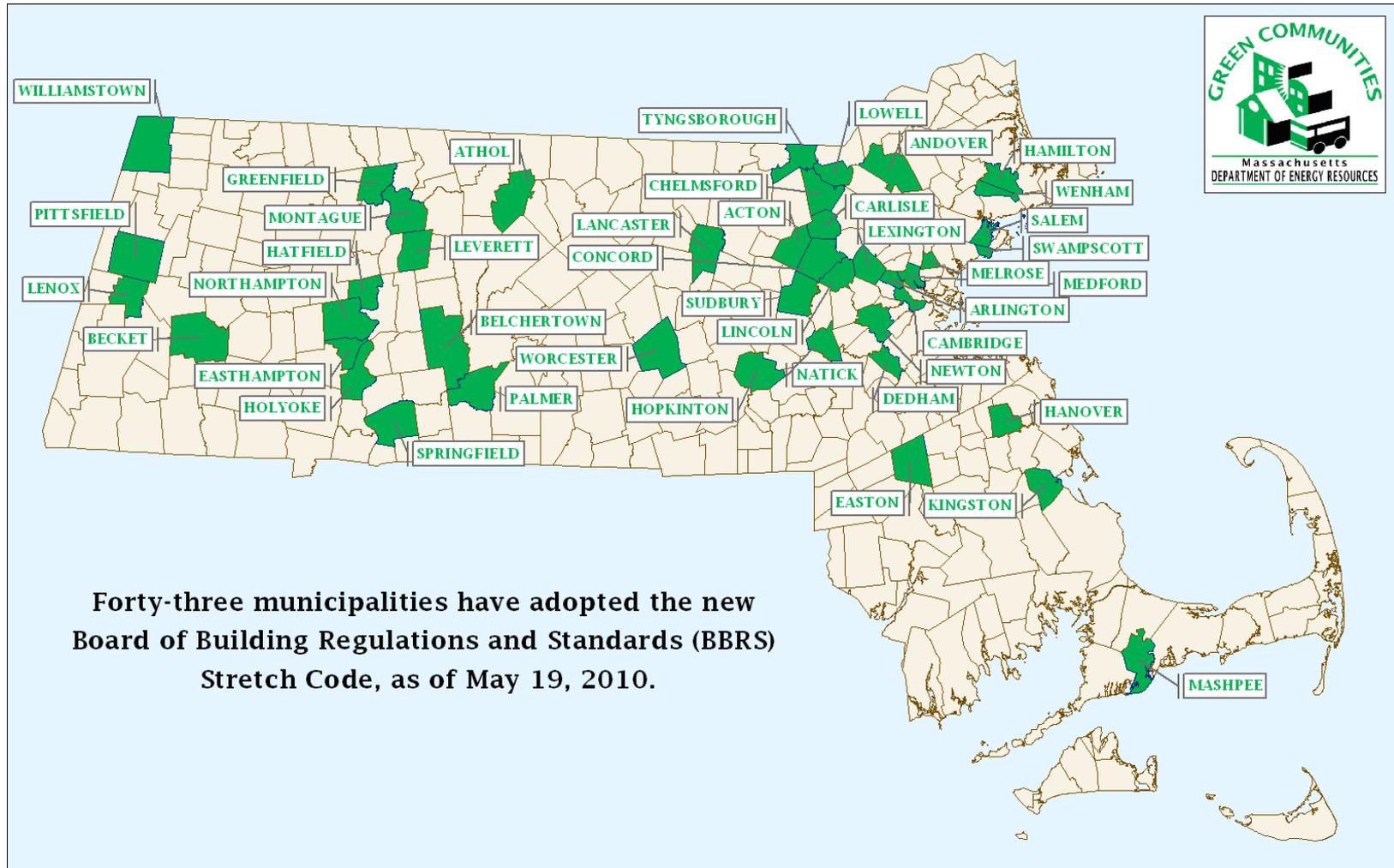
MANDATORY OPTIONS - PRESCRIPTIVE COMPLIANCE

507.1 Requirements. Buildings* are required to comply with any one of the following sections:

- a. 507.2.1 Efficient Mechanical Equipment
- b. 507.2.2 Reduce Lighting Power Density 20%
- c. 507.2.3 On-Site Supply of Renewable Energy

Builders may select more than one. No mix 'n match; if you select one you have to comply fully with those requirements, even though you may also be using some efficient equipment or providing some renewable energy features.

Current Situation in Massachusetts



- Stretch code of today can be the model code of tomorrow.
- Commercial code proposal based on 120.AA will be up for consideration at the Final Action Hearings for the International Code Council in Charlotte.
- Many requirements in Energy Star Homes (such as building infiltration) are included in proposals at the Final Action Hearings.

ASHRAE Standard 189.1 California Green Standards Code

ASHRAE Standard 189.1 --- (Commercial)

- 27% more energy efficient than ASHRAE 90.1-2007 (on average)

CA Green Standards Code --- (Residential and Commercial)

- Tier 1- 15% more energy efficient than California Energy Code (Title 24)
- Tier 2- 30% more energy efficient

- Residential (CA Green Code)
 - Commissioning
 - Renewable Energy
 - More efficient appliances
- Commercial (CA Green Code and ASHRAE 189.1)
 - Energy Use Monitoring
 - Demand Side Management
 - Renewable Energy
 - Commissioning

Massachusetts Reach Code

http://www.mass.gov/Eeops/docs/dps/inf/120.aa_stretch_code_jul24_09.PDF

ASHRAE Standard 189.1

<http://www.ashrae.org/publications/page/927>

California Green Standard Code

http://www.documents.dgs.ca.gov/bsc/CALGreen/2010_CA_Green_Bldg.pdf

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