



# *Introduction to the Thousand Home Challenge*

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# Webinar - Objectives

1. Introduce the Thousand Home Challenge (THC)
2. Review the criteria for meeting the Thousand Home Challenge
3. Provide an opportunity to get your questions answered
4. Benefit from your feedback & questions

# **PURPOSE:**

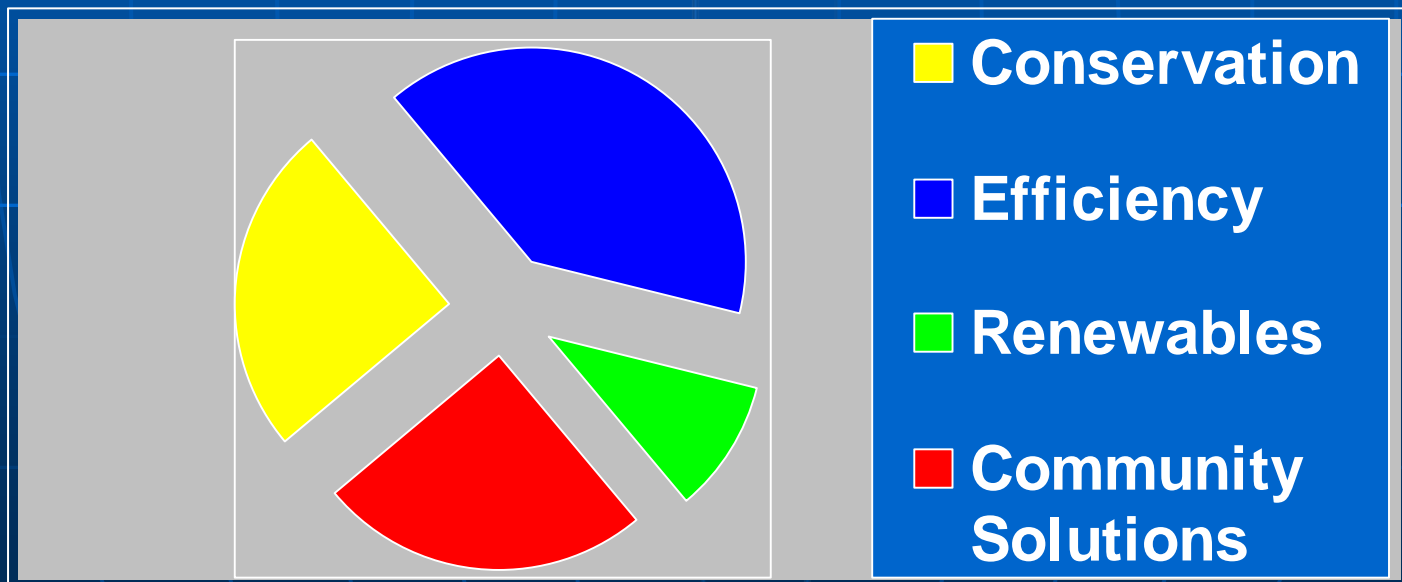
## **The Thousand Home Challenge**

**To lay the foundation for transforming North American homes**

**Demonstrate** the potential for 70 - 90% energy reductions in 1,000 existing homes.

# The Thousand Home Challenge:

1. **Integrate** energy efficiency with on-site renewables, behavioral & lifestyle choices, & community-based solutions



# The Thousand Home Challenge: (continued...)

**2. Develop** indicators of home energy performance

**3. Exemplify** performance-based systems to design, deployment, & verification

# The Thousand Home Challenge: (continued...)

**4. Assemble** local / regional centers of excellence

**5. Stimulate** collaboration, creative problem-solving, & innovative products

**6. Leverage** a Thousand Home Challenge multiplier

# How is the Thousand Home Challenge Unique?

- Bottom line: *Actual total use*, not modeled
- *Key metric*: Customized household energy use threshold allowance
- Includes human & social dimension, *not just technical solutions*
- *Stimulate creative solutions*; Lots of potential paths; not prescriptive
- *Vision for scalability*

# Questions & Feedback?

# THC Timeline

## Pilot Phase – Right now

- Confirmation of sponsors & collaborators
- Draft & revise guidance documents
- Accepting projects now
- “Intro to the Thousand Home Challenge” webinar
- Development of website & case studies

## Launch – Late 2010

# \*Thousand Home Challenge

*Sponsors<sup>1</sup>, Ring Leaders, & Collaborators<sup>2</sup>*

EFI, CSG, National Grid, NYSERDA, PG&E<sup>1</sup>  
Saturn Resources Management, Inc.

CCHRC, City of Boulder, Office of Environmental  
Affairs, CMHC, Community Solutions,  
Conservation Connection Consulting, CSG, Davis  
Energy Group, Inc., NAHN, National Grid, NEEP,  
NREL, PG&E, Sustainable Spaces

ACEEE, AO Smith, BKi, BSC, Columbia Gas of Ohio,  
Conservation Technologies, ConSol, Delta-T, Inc.,  
GreenHomes America, Heyoka Solutions LLC, HomeEnergy  
magazine, Johns Manville, KEMA Services Inc., LBNL,  
Metropolitan Energy Center, Minnesota Power, Oak Ridge  
National Labs, Passive House Institute US, PSD, VEIC, WSU  
Energy Program

<sup>1</sup>Guidance Document / Website Sponsor

<sup>2</sup>Current as of 9/30/08

**Key Metric**  
*Transparent & Direct*  
*Include Occupants*

**Net Annual Household Site Energy**  
(wood included, solar and onsite  
renewables = credit / offset)

# Not Included in THC but Very Important

- Embodied Energy – food, energy, consumables, waste, building materials
- Transportation Energy

However, telling the story of  
a home's performance  
includes many indicators of  
performance, including...

# Direct Indicators of Performance

- Btu/kWh per Home
- Household Annual Cost (\$)
- Btu/kWh per Person
- Btu/kWh per FFA (finished floor area)
- Peak Energy (if measured)
- Water & Sewage (if measured)

# Indirect Indicators of Performance

- Btu/kWh per HCDD (heating and cooling degree day)
- Tons Carbon Equivalent
- Peak Energy
- Source Energy
- Home Energy Rating

# Two Options for Qualifying

*Meet or exceed a customized household energy allowance*

## OPTION A

**Relative**, 75%  
reduction

Input: Annual measured  
previous energy use

For higher use  
households with  
measured pre-use

## OPTION B

**Absolute**, not relative

Inputs: climate, house  
size, occupants, heat  
source, attached /  
detached

For low-use households

# OPTION B: Customized Household Threshold

Estimates energy needed for a very high performance house for:

- Heating
- Cooling
- Hot Water
- Everything Else

Sum is the actual site energy household threshold that must be met or exceeded in order to meet the Thousand Home Challenge.

# THC – Option B – Total Annual kWh / Year Threshold

<i>3 Member (actual) Household</i>	House Size - Square ft		
	<b>1200</b>	<b>2400</b>	<b>3600</b>
<b>SAN DIEGO, CA</b>	<b>3123</b>	<b>3363</b>	<b>3603</b>
<b>PHOENIX, AZ</b>	<b>4212</b>	<b>5142</b>	<b>6033</b>
<b>HOUSTON, TX</b>	<b>4577</b>	<b>5587</b>	<b>6553</b>
<b>NEW YORK, NY</b>	<b>7243</b>	<b>9414</b>	<b>11479</b>
<b>BOSTON, MA</b>	<b>7738</b>	<b>10121</b>	<b>12385</b>
<b>BURLINGTON, VT</b>	<b>9001</b>	<b>11957</b>	<b>14761</b>
<b>DULUTH, MN</b>	<b>10548</b>	<b>14206</b>	<b>17673</b>

INPUTS: detached, 3 full-time occupants, fossil or wood heat & finished floor area (FFA) not CFA or TFA

# THC – Option B – Total Annual kWh / Year Threshold

1 Member (actual) Household	House Size - Square ft		
	1200	2400	3600
SAN DIEGO, CA	1615	1855	2095
PHOENIX, AZ	2882	3811	4702
HOUSTON, TX	3118	4127	5093
NEW YORK, NY	5561	7733	9797
BOSTON, MA	6009	8393	10656
BURLINGTON, VT	7194	10150	12954
DULUTH , MN	8647	12304	15771

INPUTS: detached, 1 full-time occupant, fossil or wood heat & finished floor area (FFA) not CFA or TFA

# How far does OPTION B go?

- Goal to be challenging for everyone
- Developed independently of EPA Home Energy Yardstick (HEY)
- Spreadsheet shows Yardstick estimate of average US energy for same household  
(Usually 15% to 30% of Yardstick average estimation fossil heat; 40% if electric heat)
- **Ballpark:** 70% to 85% less than average home in same climate, same size, & number of occupants (~9.9999 HEY score)

# THC REDUCTION MATRIX

## (Mild Climate Sample)

ANNUAL HOUSEHOLD kWh  
(Pre-, Proposed, and Threshold)

Loads	Current Use	Proposed Usage Reductions - kWh/yr					Target Use	THC Threshold
	(breakout may be estimated)	Efficiency		Behavioral	Renewables	Community		
	(kWh/yr)	Building Upgrades	Equipment Upgrades	Choice Reductions	On-site Offsets	Solutions	(kWh/yr)	(kWh/yr)
Heating	<b>10,000</b>	<b>5,000</b>	<b>1,000</b>	<b>1,000</b>			<b>3,000</b>	<b>1,821</b>
Cooling								
Hot Water	<b>5,000</b>	<b>500</b>	<b>1,000</b>	<b>1,000</b>	<b>2,000</b>	<b>500</b>	<b>500</b>	<b>1,060</b>
All Else	<b>6,000</b>		<b>1,500</b>	<b>2,000</b>	<b>2,000</b>	<b>500</b>	<b>0</b>	<b>1,620</b>
Total	<b>21,000</b>	<b>5,500</b>	<b>3,500</b>	<b>4,000</b>	<b>4,000</b>	<b>1,000</b>	<b>3,500</b>	<b>4,500</b>

**REDUCTION**

**18,500** kWh/yr

Thousand Home Challenge

# How to Start a THC Project

- Participate – Intro to Thousand Home Challenge Webinar
- Determine household threshold allowance
- Start with needs / wants
- Assess context & resources
- Assemble team & information; learn from others
- Plan actions & process

# THC Projects

- “All at Once” or multi-year “Phased”
- Accept projects in progress or who have met THC performance
- Conditional acceptance - Commit to vision, actions, & process
- Officially meet THC: 1 year of documented energy use
- Not just energy reductions

# Initiatives & Synergy

*Things to Ponder - How can...*

- The THC support your goals?
- You support the Thousand Home Challenge?
- We build knowledge & capacity to achieve & deploy deep energy reductions?
- We develop & document local / regional solutions?

# *Online Resources*

## *(Many paths to Deep Energy Reductions...)*

[www.ThousandHomeChallenge.org](http://www.ThousandHomeChallenge.org)  
[www.ThousandHomeChallenge.net](http://www.ThousandHomeChallenge.net)  
[www.ThousandHomeChallenge.com](http://www.ThousandHomeChallenge.com)  
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- Deep Energy Reduction Case Studies
- Thousand Home Challenge Project Planning Resources
- Resources on Superinsulation
- ACI White Paper - One Year Later

*Move on to Threshold  
Calculator Spreadsheet*

[www.1000HomeChallenge.org](http://www.1000HomeChallenge.org)



# *Feedback Welcome*

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