



# Real Life Tax Credits Small Houses vs. Large Houses

Presented By Robby Schwarz





#### **Details**

- 50% less energy use than a home built to the 2004 IECC
  - The 50% divided into two parts
    - 20% of the 50% is Envelope Loads which only need to beat the 2004 IECC by 10%
    - The remainder is Normalized Energy Consumption
- Energy use is restricted to heating and cooling energy use
- Based on analysis and testing performed by Energy Raters



### Normalized Energy Calc

- Currently two methods allowed by IRS
  - Normalized Consumption
  - Normalized, Modified End-Use Loads.
- "These are both attempts to determine the overall performance of the home in a fuel-neutral manner w/o using the dreaded words "site" or "source." Dave Roberts
  - There is a toggle on the Options menu in Rem Rate for changing between the two methods.
- "I explain the nMUEL like this: The metric considers the performance of the shell, and the efficiency of the mechanical equipment relative to all available equipment of the same type." Dave Roberts



#### In Practice

- Shell and mechanical equipment driven
  - Excellent insulation
  - High efficiency mechanical equipment
- Window to wall ratio important
- Airtightness is key
- Mechanical ventilation
- Heating loads and cooling loads
- No guessing on our part!

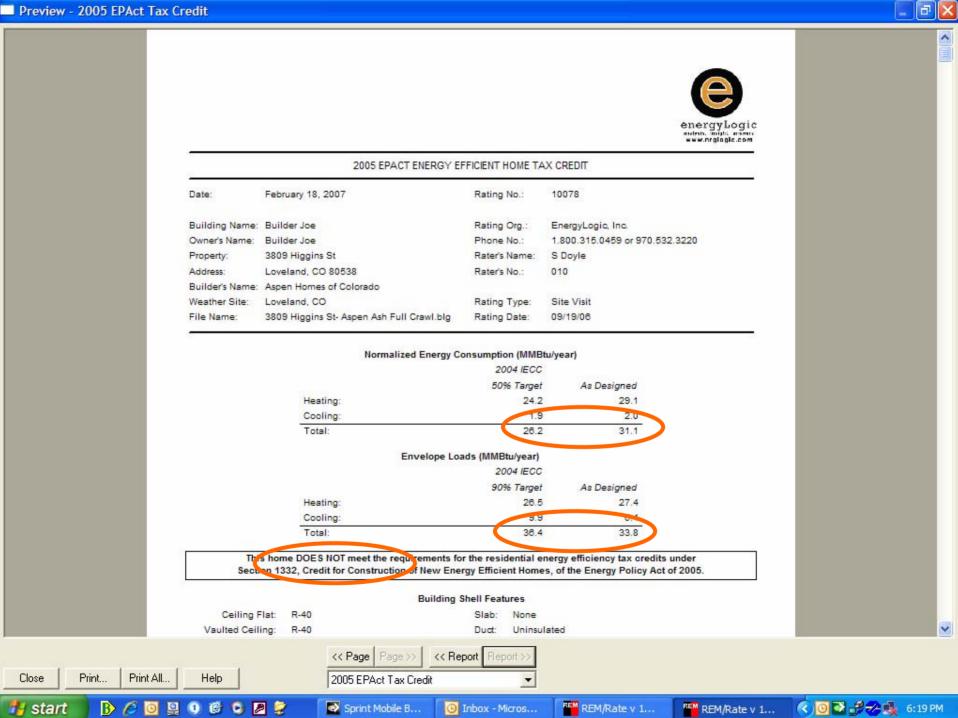


#### Small Houses and the Tax Credit



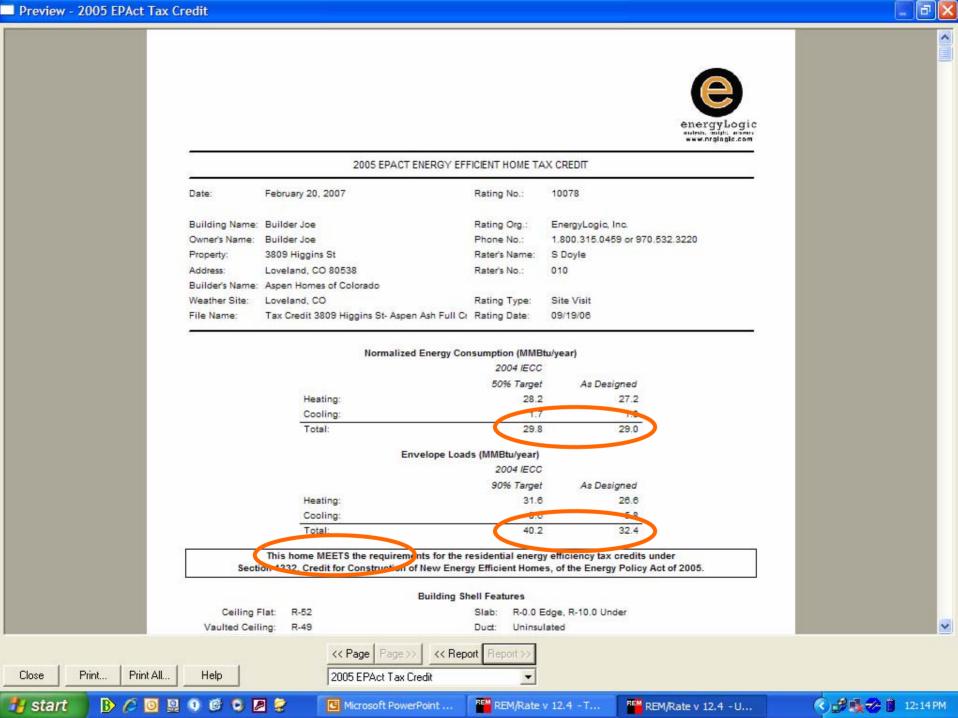
# Small House on Conditioned Crawl HERS Index 69 (Fails TC)

- 1399 SqFt 18124 Volume
- Window to wall ratio 0.146
- Crawl foundation wall R-19
- Rim & Box sill R-19
- AGW 2x4 R-15 + R5 FB / Wall to Garage R-15
- Windows Low E .35 / .28
- Doors Front insulated R6.6 / to Garage 2.10
- Attic Flat and Open Vault R-40
- 92.1 AFUE / 13 SEER / 0.82 EF Tankless
- Duct Leakage to outside 51 CFM
- Infiltration 915 CFM@50 / 0.14 NACH / ACH@50 3.03
- Ventilation 45 CFM on 1/3 Duty Cycle



# Small House with Full Crawl HERS Index 65 (Passes TC)

- 1399 SqFt 18124 Volume
- Window to wall ratio 0.146
- Crawl foundation wall R-19
- Under Slab Insulation R-10
- Rim R-35 & Box sill R-19
- AGW 2x4 R-15 + R10 FB / Wall to Garage R-15
- Windows Low E .30 / .30
- Doors Front insulated R6.6 / to Garage 6.6
- Attic Flat and Open Vault R-49
- 93 AFUE / 13 SEER / 0.82 EF Tankless
- Duct Leakage to outside 51 CFM
- Infiltration 915 CFM@50 / 0.14 NACH / ACH@50 3.03
- Ventilation 45 CFM on 1/3 Duty Cycle



## Small House on Conditioned Basement HERS Index 67 (Passes TC)

- 2798 SqFt / 23783 Volume
- Window to wall ratio 0.167
- Basement foundation wall R-19
- Under Basement Slab R-0
- Rim & Box sill R-19
- AGW 2x4 R-15 + R5 FB / Wall to Garage R-15
- AGW Windows Low E .35 / .28
- BGW DV .52 / .62
- Doors Front insulated R6.6 / to Garage 2.10
- Attic Flat and Open Vault R-40
- 92.1 AFUE / 13 SEER / 0.82 EF Tankless
- Duct Leakage to outside 51 CFM
- Infiltration 915 CFM@50 / 0.14 NACH / ACH@50 3.03
- Ventilation 45 CFM on 1/3 Duty Cycle



#### **Small House Basement**

- Foundation to R-11 Fails
  - NEU 0.2 / Envelope Loads Pass
- No Foundation Insulation Fails
  - NEU 19.5 / Envelope Loads 5.9

#### Small House on Slab HERS Index 71 (Fails TC)

- 1399 SqFt 11192 Volume
- Window to wall ratio 0.146
- Slab foundation wall R-0
- AGW 2x4 R-15 + R5 FB / Wall to Garage R-15
- Windows Low E .35 / .28
- Doors Front insulated R6.6 / to Garage 2.10
- Attic Flat and Open Vault R-40
- 92.1 AFUE / 13 SEER / 0.82 EF Tankless
- Duct Leakage to outside 51 CFM
- Infiltration 915 CFM@50 / 0.14 NACH / ACH@50 3.03
- Ventilation 45 CFM on 1/3 Duty Cycle

# Small House with Full Slab HERS Index 64 (Passes TC)

- 1399 SqFt 11192 Volume
- Window to wall ratio 0.146
- Under Slab Insulation R-10 Perimeter R-15
- Rim R-35 & Box sill R-19
- AGW 2x4 R-15 + R10 FB / Wall to Garage R-15
- Windows Low E .30 / .30
- Doors Front insulated R6.6 / to Garage 6.6
- Attic Flat and Open Vault R-49
- 93 AFUE / 13 SEER / 0.82 EF Tankless
- Duct Leakage to outside 51 CFM
- Infiltration 915 CFM@50 / 0.14 NACH / ACH@50 3.03
- Ventilation 45 CFM on 1/3 Duty Cycle



#### Large House and the Tax Credit



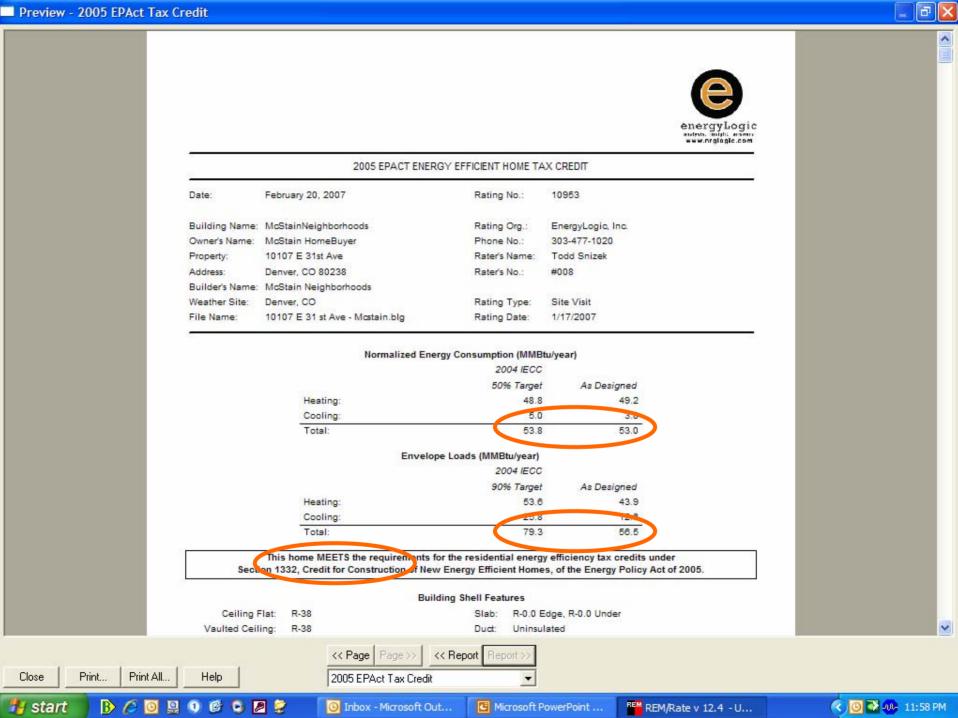


On RESNET's Web Site

House we are looking at

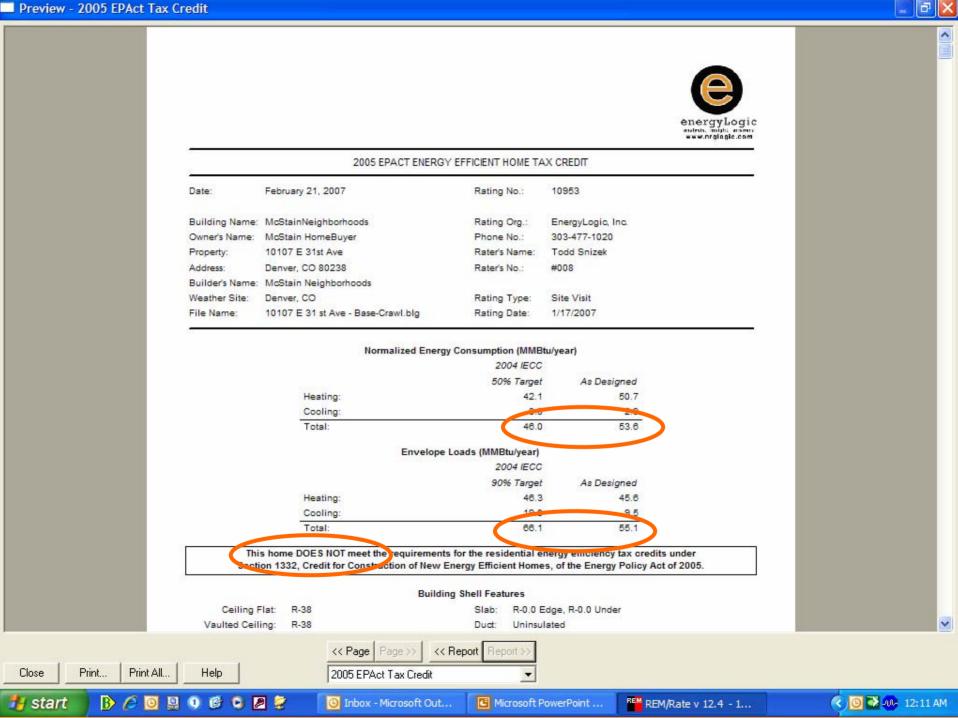
# Large House Basement Crawl HERS Index 62 (Passes TC)

- SqFt 3998 Volume 38254
- Window to wall ratio .251
- Basement and Crawl foundation wall R-11
- Slab Insulation R-0
- Cantilever R-43
- Rims and Box Sills R-19
- AGW and Wall to Garage R-20
- Knee Wall R-13
- Windows Low E .35 / .27
- Doors Front insulated R-5 / to Garage R-2.8
- Attic Flat and Open Vault R-38
- 92.1 AFUE / 13 SEER / 0.62 EF
- Duct Leakage to outside 239 CFM (Energy Star's 6 CFM/100sqft
- Infiltration 2100 CFM@50 / 0.20 NACH / ACH@50 3.29
- Ventilation 112 CFM on 1/3 Duty Cycle



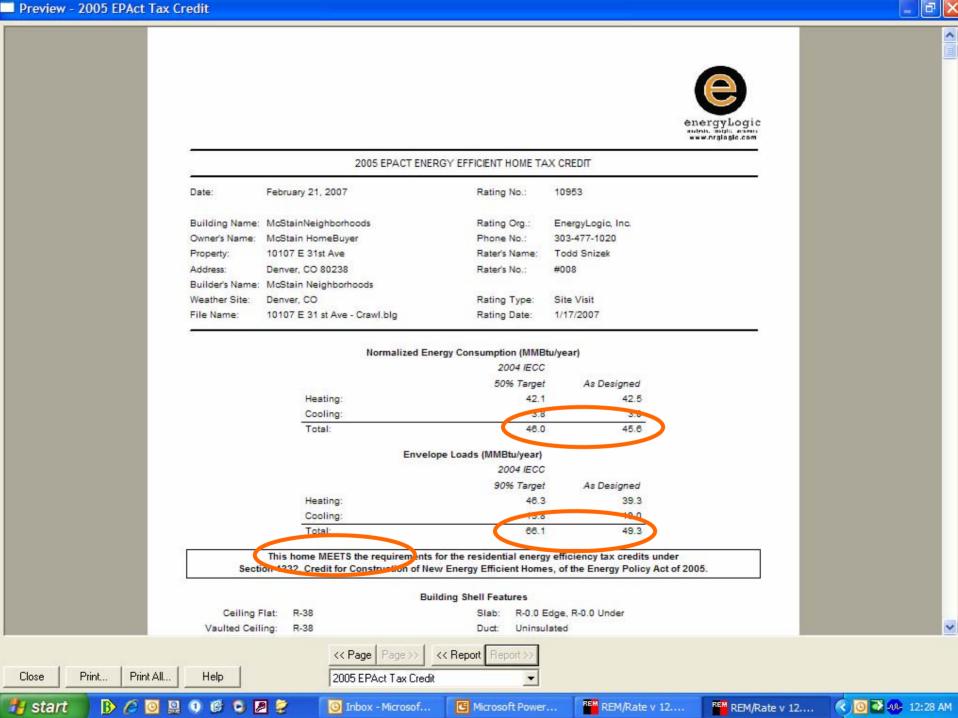
## Large House Conditioned Crawl HERS Index 66 (Fails TC)

- SqFt 2799 Volume 32268
- Window to wall ratio .222
- Crawl foundation wall R-11
- Slab Insulation R-0
- Cantilever R-43
- Rims and Box Sills R-19
- AGW and Wall to Garage R-20
- Knee Wall R-13
- Windows Low E .35 / .27
- Doors Front insulated R-5 / to Garage R-2.8
- Attic Flat and Open Vault R-38
- 92.1 AFUE / 13 SEER / 0.62 EF
- Duct Leakage to outside 239 CFM (Energy Star's 6 CFM/100sqft)
- Infiltration 2100 CFM@50 / 0.20 NACH / ACH@50 3.29
- Ventilation 112 CFM on 1/3 Duty Cycle



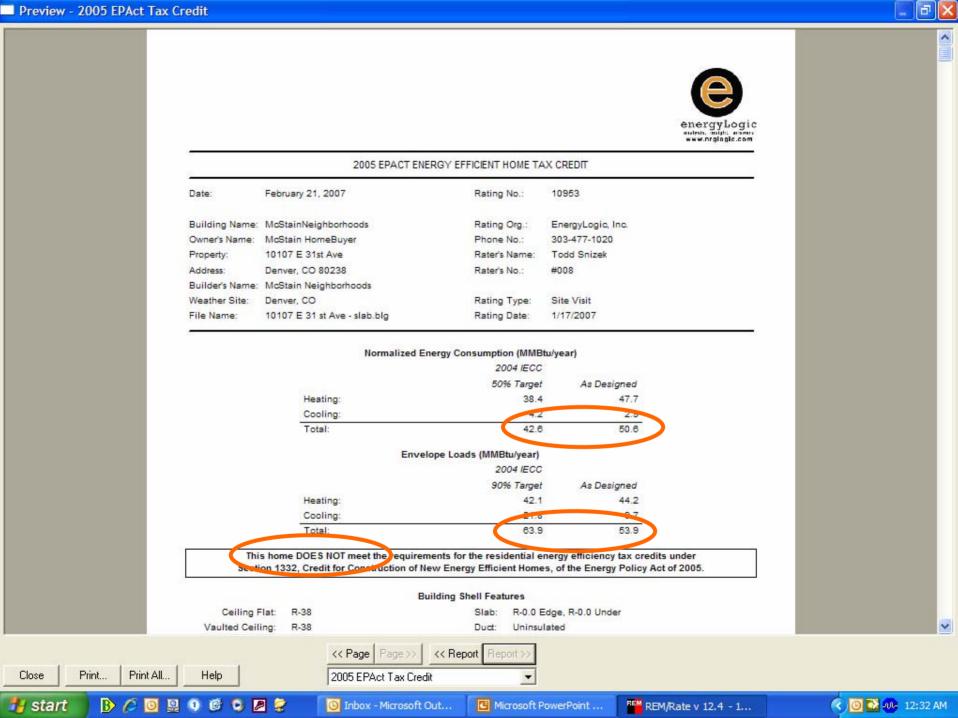
## Large House Conditioned Crawl HERS Index 66 (Passes TC)

- SqFt 2799 Volume 32268
- Window to wall ratio .222
- Crawl foundation wall R-19
- Slab Insulation R-0
- Cantilever R-43
- Rims and Box Sills R-19
- AGW and Wall to Garage R-20
- Knee Wall R-13
- Windows Low E .35 / .27
- Doors Front insulated R-5 / to Garage R-2.8
- Attic Flat and Open Vault R-38
- 92.1 AFUE / 13 SEER / 0.62 EF
- Duct Leakage to outside 111CFM (4 CFM/100sqft)
- Infiltration 1300 CFM@50 / 0.15 NACH / ACH@50 2.42
- Ventilation 112 CFM on 1/3 Duty Cycle



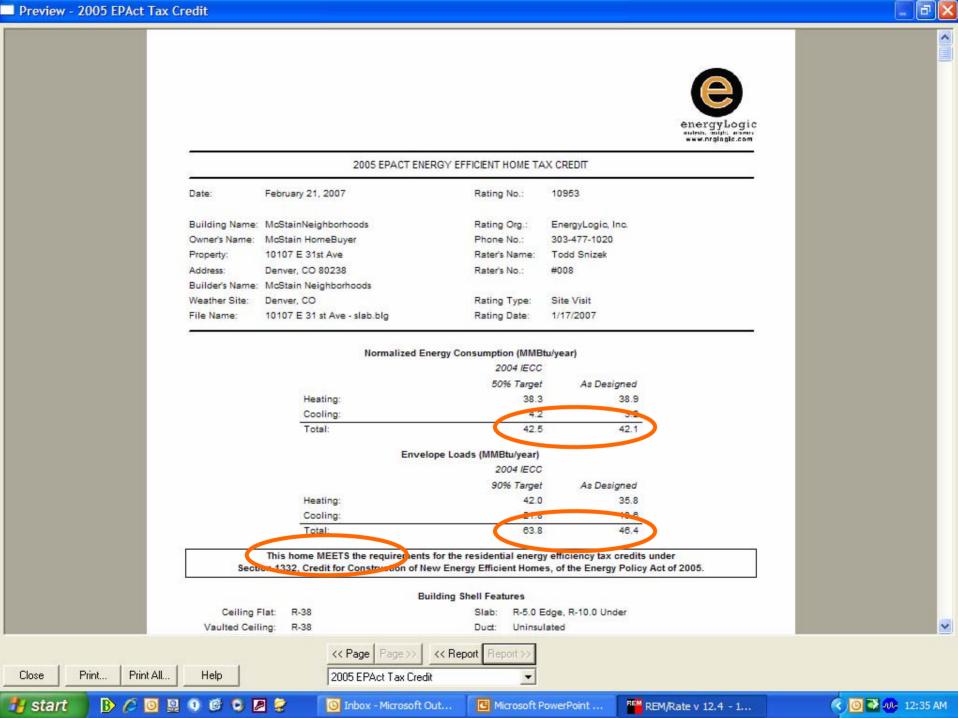
#### Large House on Slab HERS Index 67 (Fails TC)

- SqFt 2799 Volume 25191
- Window to wall ratio .222
- Slab Insulation R-0
- Cantilever R-43
- Rims and Box Sills R-19
- AGW and Wall to Garage R-20
- Knee Wall R-13
- Windows Low E .35 / .27
- Doors Front insulated R-5 / to Garage R-2.8
- Attic Flat and Open Vault R-38
- 92.1 AFUE / 13 SEER / 0.62 EF
- Duct Leakage to outside 111CFM (4 CFM/100sqft
- Infiltration 1300 CFM@50 / 0.19 NACH / ACH@50 3.10
- Ventilation 112 CFM on 1/3 Duty Cycle



#### Large House on Slab HERS Index 63 (Passes TC)

- SqFt 2799 Volume 25191
- Window to wall ratio .222
- Slab Insulation R-10 Perimeter R-5
- Cantilever R-43
- Rims and Box Sills R-19
- AGW and Wall to Garage R-20
- Knee Wall R-13
- Windows Low E .35 / .27
- Doors Front insulated R-5 / to Garage R-2.8
- Attic Flat and Open Vault R-38
- 92.1 AFUE / 13 SEER / 0.62 EF
- Duct Leakage to outside 111CFM (4 CFM/100sqft
- Infiltration 1300 CFM@50 / 0.19 NACH / ACH@50 3.10
- Ventilation 112 CFM on 1/3 Duty Cycle





### Thank you