



Whole Market Transformation – Residential New Construction (RNC) in California

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Uses of RNC Study Data

- Multiple studies shared the survey data
 - Baseline Study - characteristics of non-participant houses
 - RNC Program Impacts
 - Codes & Standards Program Impacts
 - RNC Market Effects Study
 - Inter-related findings for whole market segment
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Residential Baseline Study

- Based on on-site surveys and energy modeling
- Describe characteristics of new homes
 - compare to trends
- Estimate energy use vs. code for non-participant houses
- Never published as stand-alone - used for other three studies

Baseline Information

- **Glazing**
 - Glazing % dropped from 17% to 14% since 1995
 - Dual pane vinyl, low-e now in 95% of homes
 - **Space heating**
 - Avg furnace efficiency from 80% to 83%
 - 90%+ AFUE furnaces from 2% to 19% of homes
 - **Space cooling**
 - Avg SEER from 10.5 to 13.3 since 1995
 - SEER >13 increased from 0% to 34%
 - **Etc.** (DHW, ceiling insul, radiant barriers, duct leakage)
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RNC Program by Utilities

- Statewide Advanced Homes Program
 - Each utility runs its version
 - Consistent approaches and rebates
 - Evaluated 2006-2008 Program Cycle
 - Evaluation work 2007-2009
 - Final report February 2010
 - Estimated direct program impacts
 - Savings in energy, demand, gas
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RNC Impact Findings

- RNC market activity WAY down
- Actual savings differed from claimed
 - Models seriously underestimated cooling energy, overestimated heating energy
 - Electricity savings higher than expected; gas savings lower
- Baseline (code compliance) varied
 - Most areas homes were better than code

Codes & Standards Program

- Multiple res code enhancements, e.g.:
 - Hardwired lighting
 - Duct sealing
 - Whole home performance enhancements
 - Determined savings vs. prior code
 - Estimated compliance rates for typical houses (non-participants)
 - Used whole house modeling method
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C&S Impact Findings (Res)

- **Hardwired lighting standards**
 - Biggest savers in entire code cycle
 - Compliance rate 113% (savings > code)
 - **Whole house energy savings**
 - Electricity compliance rate 120%
 - Gas compliance rate 235%
 - **Compared as-built new homes to code homes, vs. prior code**
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RNC Market Effects

- **Pilot study**
 - Determine feasibility of measuring market effects
- **Major questions**
 - Can spillover be measured reliably?
 - What is magnitude of spillover effect?
 - How do RNC interventions affect market?

RNC Market Effects Findings

- There is spillover from RNC program
 - Improved code compliance
 - Greater above-code construction
 - Overall RNC compliance margins
 - 58% of homes better than code
 - 13% of homes below code
 - Avg RNC 7.4% less energy than code - RNC baseline is better than code
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RNC Market Effects Findings

- **Total Savings**
 - Above code homes saved 39,225 MWh
 - Below code homes wasted 5,471 MWh
 - **Net Savings (Delphi process)**
 - Nearly 50% credited to utility programs
 - Training of builders, code consultants, building officials
 - Split between 2006-08 and prior cycles
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RNC Market Effects Findings

- If utility programs ended
 - More non-compliance, worse margins
 - Similar effect if non-utility progs ended
 - Savings effects would not persist
- Good/bad news for RNC program:
 - Spillover is significant due to program
 - Higher baseline diminishes prog savings
 - Spillover captured by C&S program eval
 - ...but portfolio got the credit anyway

Discussion

- Spillover - it's clearly not zero
 - It can be measured (but complex)
 - Is it wise to neglect it?
 - Given multiple influences on market...
 - Can we parse out different, overlapping market intervention effects?
 - Does it make more sense to measure at market level?
 - How to define “program” and “intervention” for evaluation purposes?
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Studies Cited

- Residential New Construction (RNC) Programs Impact Evaluation
 - http://www.energydataweb.com/cpucFiles/topics/7/RNC_Volume_I_FinalReport_02082010.pdf
 - Codes & Standards (C&S) Programs Impact Evaluation
 - http://www.energydataweb.com/cpucFiles/topics/7/Codes_Standards_Vol_III_FinalEvaluationReport_02042010.pdf
 - RNC Market Effects Study (Phase II)
 - http://www.energydataweb.com/cpucFiles/14/RNCMarketEffects_PhaseIIFinalReport_1.pdf
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Questions/Discussion

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