



Pushing the Market: Measuring Market Effects in Residential New Construction

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Introduction



2 Studies in 2018 RNC interventions States

Residential New Construction Programs



- Long program histories
- Above-code practices
- Tiered incentives
- Builder-focused
- Code compliance

Goal: holistically and accurately identify program savings and market effects

Methodology: Delphi Panel

- Experts answering complex questions
- Iterative and interactive

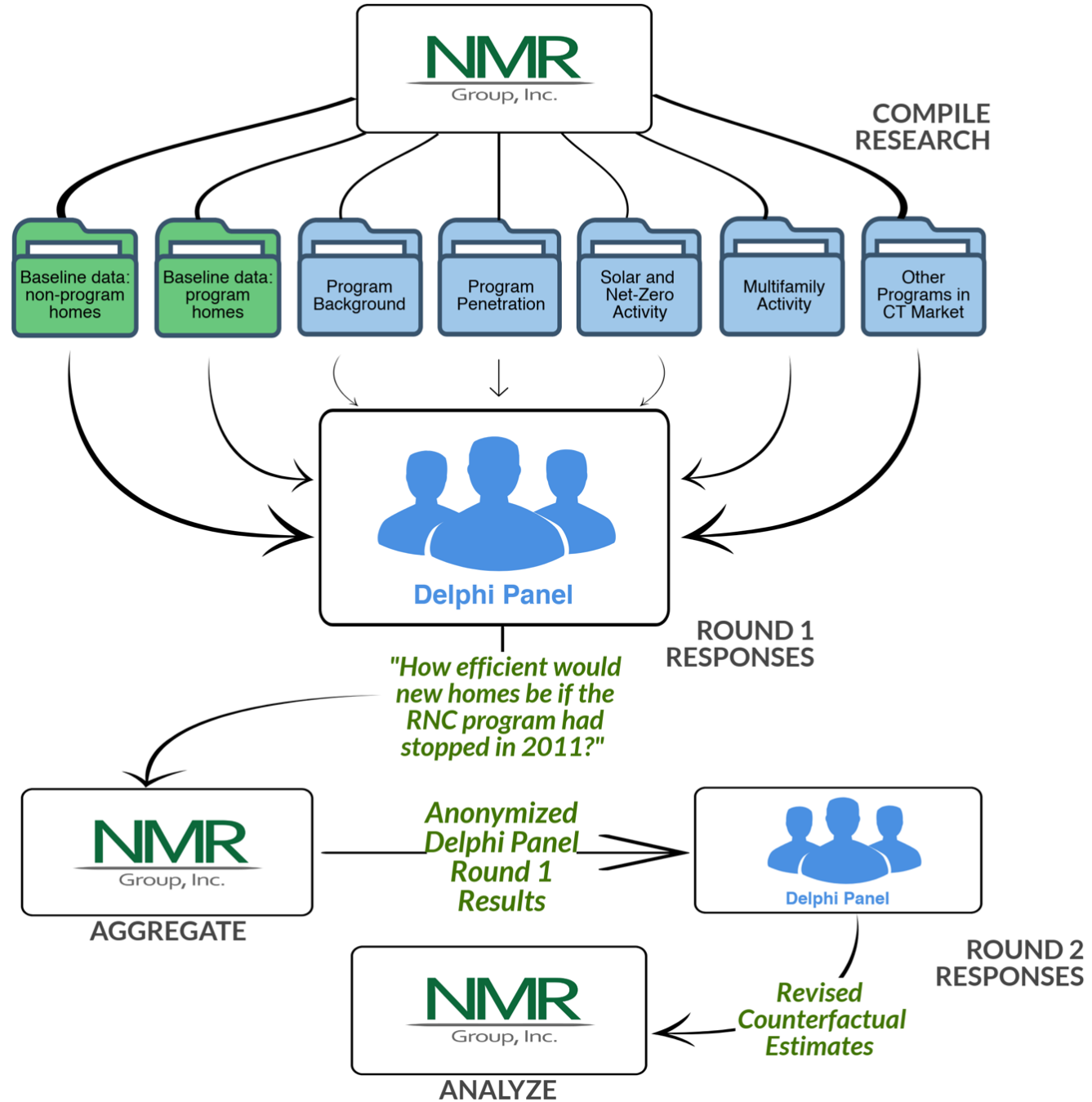
1. Compile background data to inform panelists
2. Conduct Delphi panel (3/2 rounds)

		
Efficiency consultants, builders	7	5
Code officials	3	1
Program staff	1	4
Evaluators	1	3
Other experts	3	-
Total	15	13

3. Build energy models based on hypothetical scenario (market without program)
4. Develop NTG values

Delphi Panel Process

THE PANEL



Delphi Panel Questionnaire – Round 1

Measure-level data from baseline studies:

- Air/duct leakage, insulation, lighting, windows, mechanicals
- Low, medium, and high-performance bins

Panelist tasks:

- *Watch*
- *Read*
- *Estimate*
- *Explain*

Air Infiltration	Program Homes (single-family only)				
	2016		Percent of Homes in Each Tier In Absence of Program	Average Air Infiltration in Each Tier in Absence of Program	You have not completed this section yet. Please fill in the blank blue cells.
	% of Homes	Air Infiltration			
Air Infiltration (Average ACH50)	100%	2.7			
High (poor) Air Infiltration Tier 3.4 to 5.5 ACH50	25%	3.8			
Mid Air Infiltration Tier 2.1 to 3.4 ACH50	50%	2.8			
Low Air Infiltration Tier 0.4 to 2.1 ACH50	25%	1.5			
			0%		

Please type an explanation of your reasoning behind air infiltration estimates in the space below:

Air leakage is now code and that seems to have had an impact on ACH50 in non-program homes. I think without any program in the lasts few years would

Delphi Panel Questionnaire – Round 2

- Review others' responses and revise
- Round 2 results inform energy models

Program Homes (single-family only)									
Duct Leakage Tiers (CFM25/100 sq. ft. of conditioned floor area)	Actual 2016 Values		All Panelists' Round 1 Responses in Absence of Program		Your Original Response in Absence of Program		Your New Response in Absence of Program		Comparison to Actual 2016 Values
	% of Homes	Duct Leakage	% of Homes	Duct Leakage	% of Homes	Duct Leakage	% of Homes	Duct Leakage	
High (poor) Duct Leakage Tier 2.4 to 9.2 CFM25/100 ft2	25%	3.4	52.0%	5.5	70.0%	7.0	60%	6.0	76% Higher (worse)
Mid Duct Leakage Tier 1.0 to 2.4 CFM25/100 ft2	50%	1.6	32.6%	2.0	20.0%	2.0	30%	2.0	25% Higher (worse)
Low Duct Leakage Tier 0.0 to 1.0 CFM25/100 ft2	25%	0.6	15.3%	0.8	10.0%	1.0	10%	1.0	67% Higher (worse)
Average Duct Leakage	1.8						100%	Your Round 2 overall average is: 4.3, which is 139% higher (worse) than the real world average	

Key Measures Affected

*The absence of the program would result in lesser efforts to meet higher thresholds ...
Part of this would be due to lower awareness by the building community and the public in general.*

– CT Builder



Duct Leakage



Air Infiltration



Insulation Installation



Average Energy Use



Non-Stretch

<i>Program</i>	73%	37%	40%	11%
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<i>Non-Program</i>	58%	35%	8%	10%
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<i>Program</i>	102%	44%	36%	10%
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<i>Non-Program</i>	32%	22%	5%	11%
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% WORSE

Net-to-Gross Values

- Scaled up energy model results (MA: 392, CT: 280)
- High free-ridership and substantial spillover
- Program participation rates heavily impact FR/SO



*“When you do well on one home, you want to do better on the next, so you do more and more. It becomes a game.”
– Builder*

<i>Home types</i>	SF	SF+MF
<i>Free-ridership</i>	0.67	0.66
<i>Non-participant spillover</i>	0.55	1.25
<i>Net-to-Gross</i>	0.88	1.56

*“If there is no program, there is no training and no spillover.”
– HERS Rater*



- *Challenge:* rising baselines, cost-effectiveness
- *Opportunity:*
 - Limit respondent pool
 - Ensure thoughtful responses
 - Fully capture program impacts
- *Conclusions:*
 - Evidence for market effects
 - SO/FR fluctuate with program life cycle
 - Program impact subject to change

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