The Oracle Peers through a Window: Using a Delphi Approach to Estimate Impacts of Windows Incentives

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Long Beach, 2015

Efficient Windows Support

- Regional
  - NEEA initiated regional effort in 1999 (U-0.35)
  - Energy Trust since 2003 (U-0.33)
- National
  - NFRC
  - ENERGY STAR v6.0
  - Federal Tax Credits (ARRA - $1,500 in 2009/2010)

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Energy Trust Windows Objectives

- ## Program Objectives:
  - Accelerate the adoption and market penetration of cost-effective and energy efficient windows in existing residential buildings

Energy Trust Windows Incentives

- 2012-2014:
  - U-value 0.26–0.30 = $2.25/sq ft.
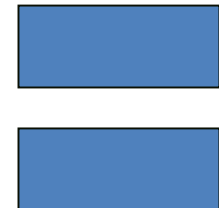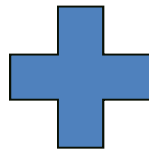 - U-value ≤ 0.25 = $3.50/sq ft
- 2015:
  - U-value 0.28–0.30 = $1.75/sq ft.
  - U-value ≤ 0.27 = $4.00/sq ft
- Shifting in response to ENERGY STAR v6.0 changes
- Market transformation next?

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Market Transformation + Baseline

Delphi Panel

Evaluation Objectives

Delphi Primary Objectives:
- Counterfactual – historic program influence
- Understand past, current, and projected baseline
- Develop incremental costs

Secondary Objectives
- Barriers to consumer adoption
- Program support for U-0.20

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Methods - Overview

- Identify and Recruit Delphi Panelists
- Online Web Survey
- Conduct Delphi Panel
  - Webinar
  - Survey

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Methods – Delphi Logic

Introduce question in webinar slides

Panel answers question in survey

Review results and discuss findings

Revise response if position changed

Compile final findings

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Findings – Delphi Approach

- Webinar proved successful
- Advantages
  - Cost, time, convenience
  - Anonymity
- Disadvantages
  - In-person engagement
  - Anonymity
- Recruitment most challenging

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Findings: Q1 - Counterfactual

- Please provide us with what you believe the market share for U-value sales would have been if Energy Trust program support had not been offered over the past several years.

- Program
  - ETO = sustained support
  - Drop 2nd Wx measure requirement

- Non-Program
  - Federal tax credit
 - Operator type and frame material "impervious"
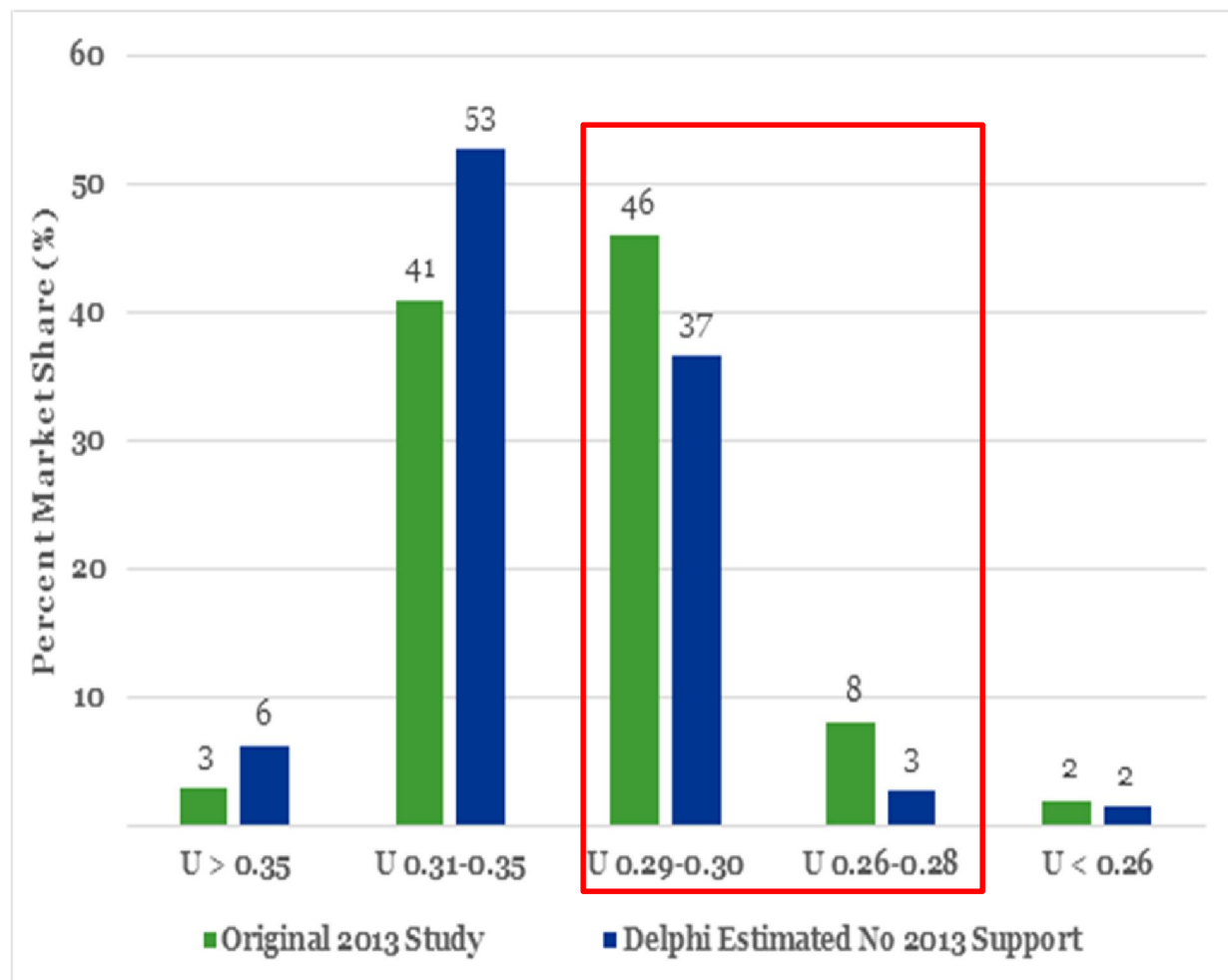
Findings: Q2 - Market Share

- Because the U-value bins are changing, we would like to understand where you believe the current market stands (beginning of 2015), where you expect it to be by 2020 both with and without continued ETO support based on these new U-value bins. Please provide us with your best estimate for the Pacific Northwest market share for:
    - Current 2015
    - Projected 2020 with continued support
    - Projected 2020 w/out support

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Findings: Q2 Market Share

- Low and high-ends of market will be static

- Largest gains will be in 0.25-0.27

- Support will be crucial to maintain lower U-value sales

- 0.25 is barrier (cost)

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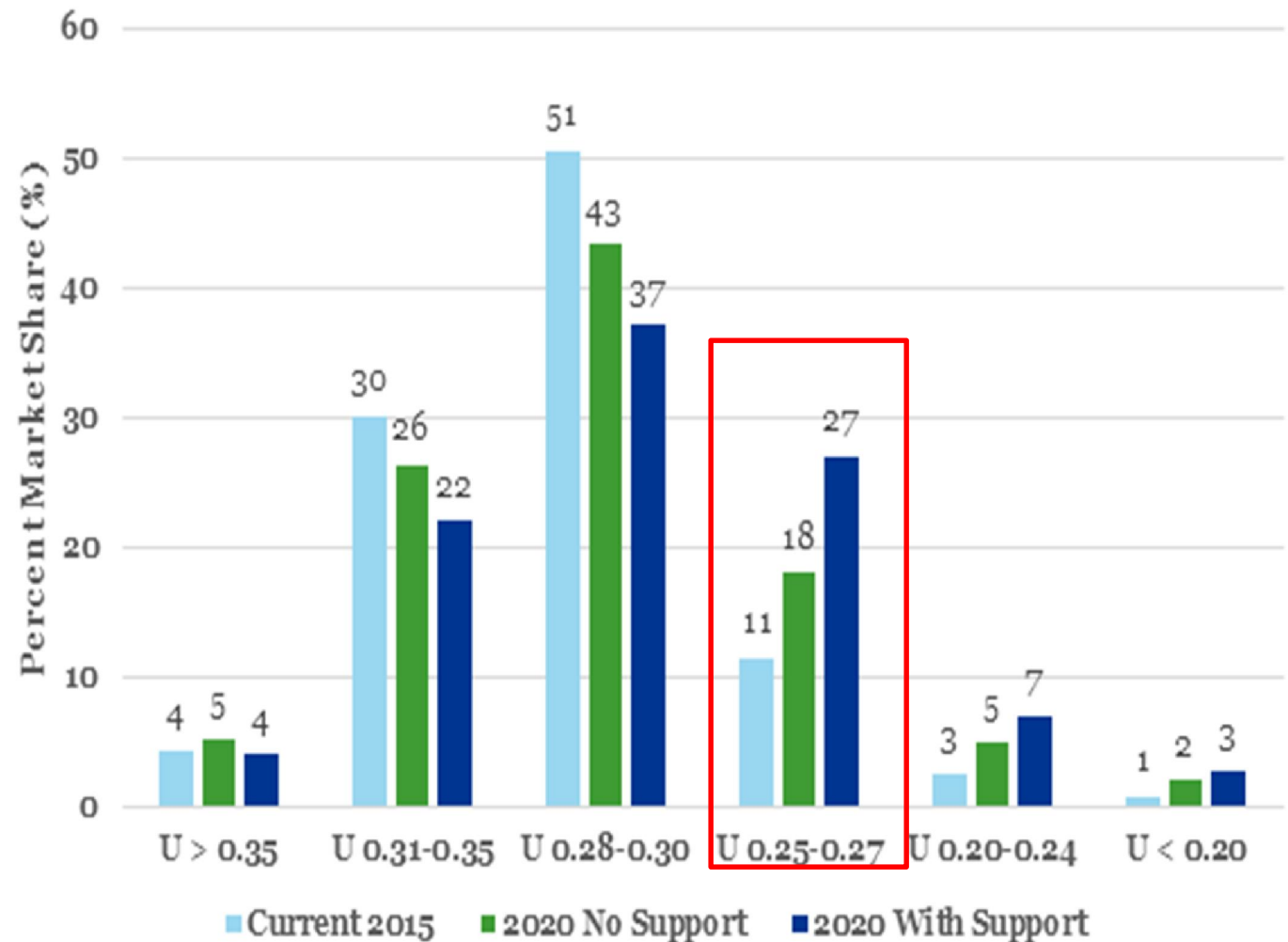
Q3: Incremental Window Costs ($/sq. ft.)

- Please help estimate overall Pacific Northwest average unit retail window cost (per square foot). Provide where you believe the market now stands (2015) and where you expect the unit cost (per square foot) to shift over the next several years (2017, 2020).

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Findings: Incremental Window Costs

- Most difficult to estimate
- Low panelist response
- Static over mid-term

IEPEC Long Beach, 2015

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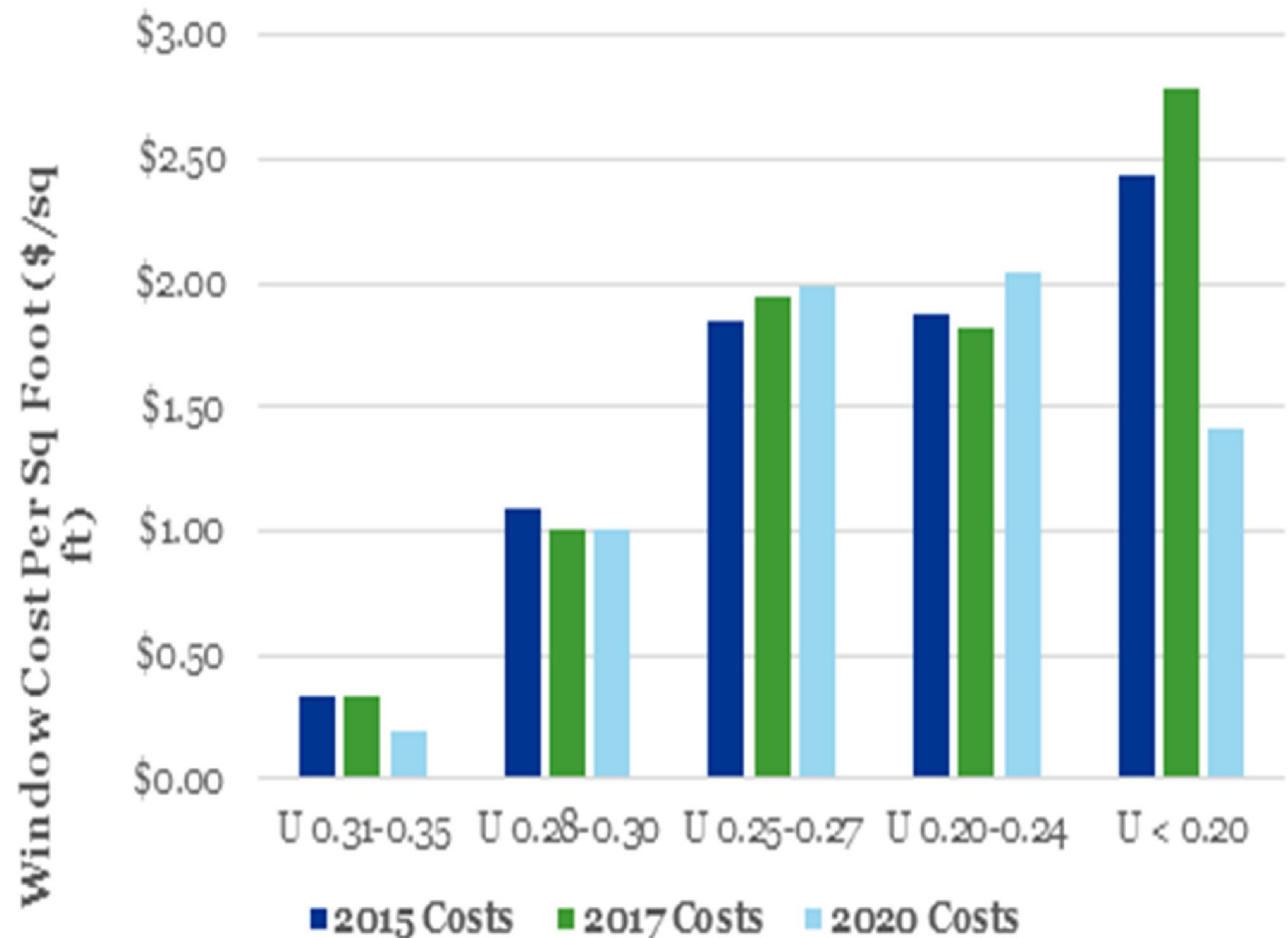
Findings – Barriers and Supporting U 0.20

- Barriers
  - Cost – primary barrier
  - Technical – triple pane, some manufacturer unable to retrofit plants
  - Window types – physical constraints
  - "Windows manufacturers are not in the energy business"
  - Whole house bundling – weighted avg.

- U-20 Support
  - ENERGY STAR Most Efficient are U-20
  - Not currently cost effective

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Findings – Other Notable Issues

- Solar heat gain coefficient (SHGC)
- Low-e storm windows
- Poor sealing/weather-stripping

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Closing

- Webinar-based Delphi – Plan and Backup
- Program accelerates and magnifies adoption
- Market share estimates = market transformation baseline
- U-20
- Maintain engagement with panelists
- Incremental costs vs. incentives

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Questions?

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