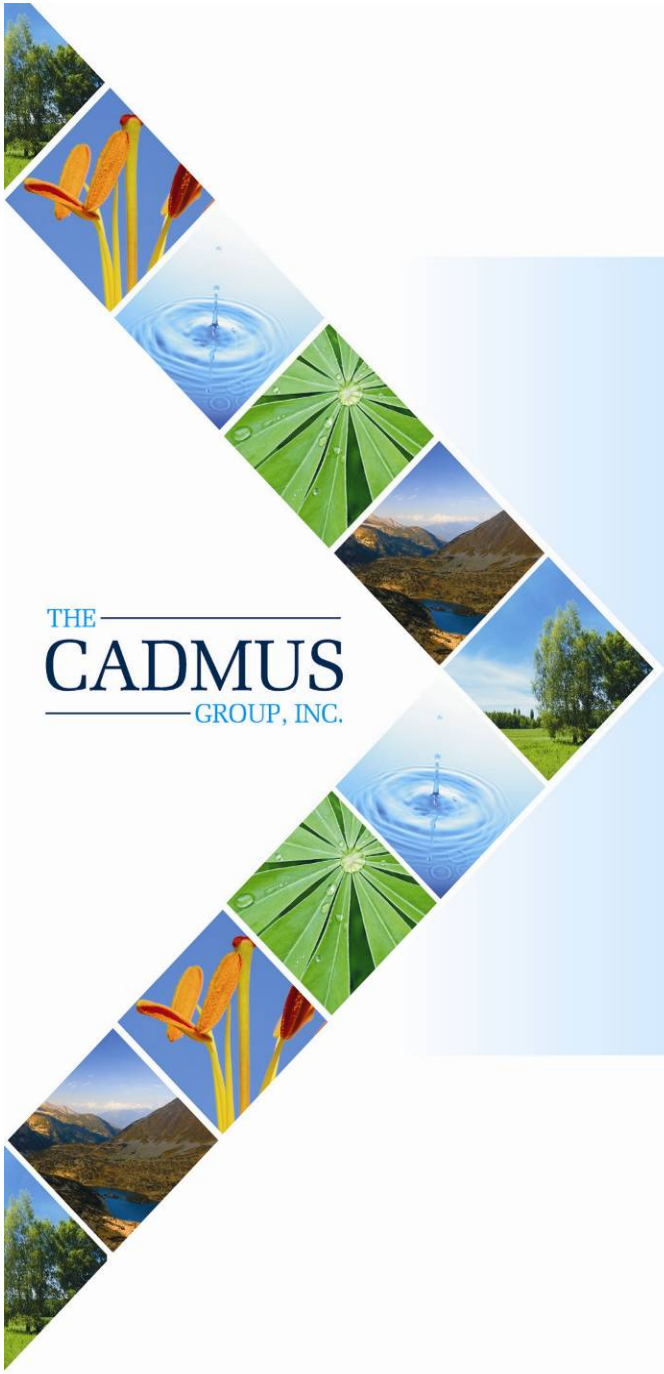

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What Will the Lighting Market Look Like Under EISA?

2011 National Symposium on Market Transformation

April 11, 2011

David Sumi, Eric Rambo, and Bryan Ward

The Cadmus Group – Madison, WI

Overview

- Expert Opinion Results Gathered (March 2011)
  - Short survey structured for modeling of most likely scenarios for general service replacement lamp market – 2012 to 2014
  - Experts represented key stakeholder groups
- Scenario Modeling – Results
  - Modeling technique
  - Most likely scenario(s)
- Lighting program implications from the *evaluation* perspective – our next steps
  - Program models, objectives, design features, and managing program risks

"Expert" Survey Objectives

- Our overall objective for the survey was to use the results to:

  (1) Empirically model the most likely scenarios for the U.S. general service replacement lamp market in the 2012 – 2014 period

  (2) Then take the results of the scenario probabilities and simulate numerous lighting program design configurations

- We have completed step 1, and are now moving on to step 2

"Expert" Survey Design

- Focus on the 2012 to 2014 period
- Elicited probabilities associated with important lighting program planning assumptions for this period
- Questions addressed:
  - Supply, demand, pricing for EISA-compliant halogens
  - Same for LEDs
  - Relative pricing and market shares for different bulb technologies (including CFLs)
  - Most likely effects of net-to-gross (NTG) on programs
  - Most likely scenarios (combining responses to above)

"Expert" Survey Sample

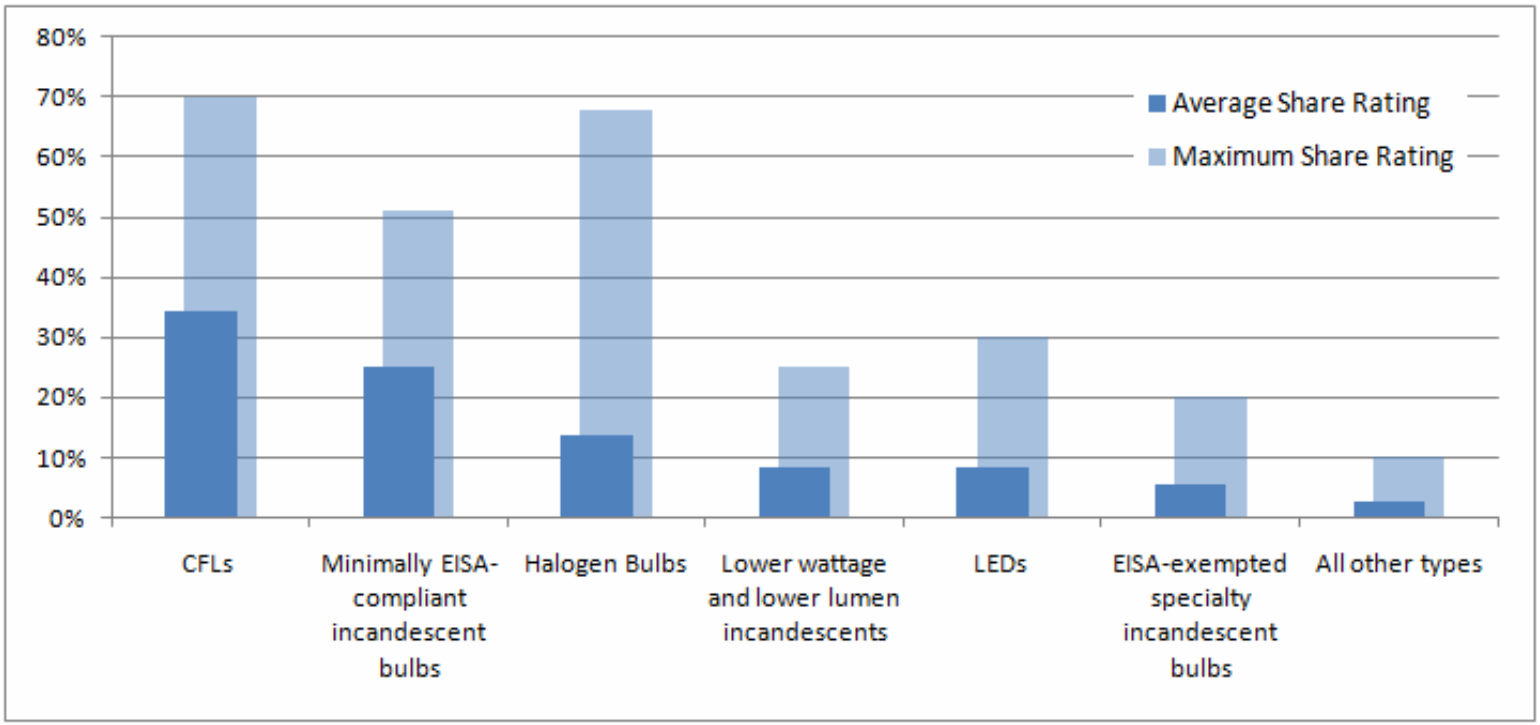
- Starting sample of 37 representing these affiliations:
  - Lighting program managers
  - Lighting consultants
  - DSM program evaluation consultants
  - Organizations with EE/DSM interests (e.g., consortia, energy centers, program design consultants, government, commissions)
  - Utility DSM staff

- 18 survey completions (plus unofficial input)

Defining Baselines – Underlying the Scenarios

- A basic question: how will EISA, and market movement toward a mix of technologies, affect the assumed baselines upon which savings (and cost-effectiveness) depend?
- And how to set a baseline condition? (From ISO-NE M&V Manual; NAPEE)
  - Retrofit: codes/standards or measured baseline (e.g., what is typically installed or "common practice")
  - Failed: codes/standards or standard practice, *whichever is more stringent*
  - New construction: codes/standards or standard practice

What will the Market Look Like in 2014?

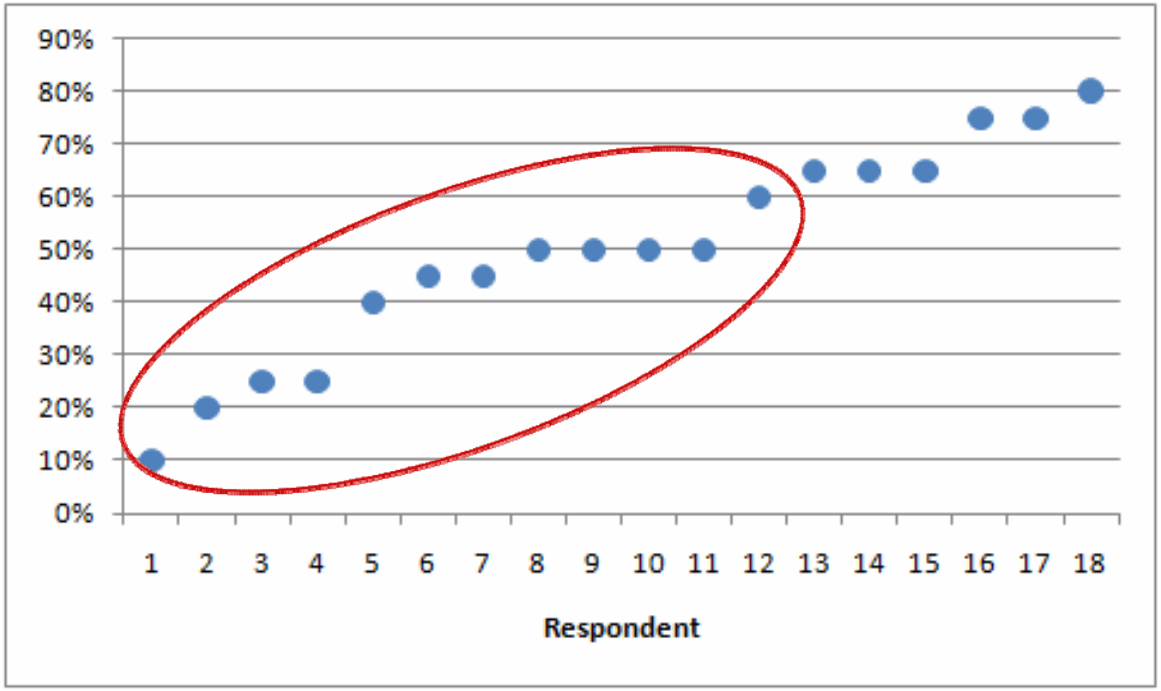


- CFLs the dominant technology
- LEDs just gaining a foothold

Will Customers Prefer Minimally EISA-Compliant Lamps to CFLs?

Min-EISA will do well but still a sizeable share of the market will prefer CFLs

Percent of market preferring Min-EISA to CFLs

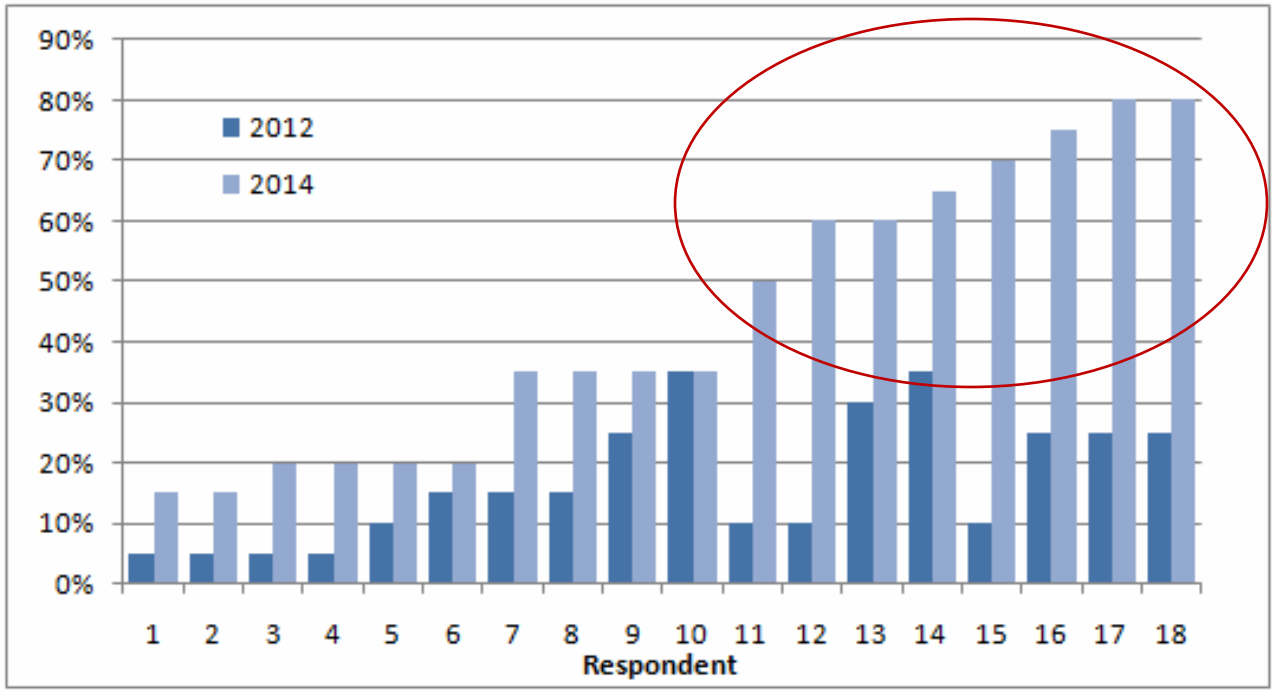


Will LEDs be Available?

Rating below 50% probability are LED skeptics.

We think the higher 2014 estimates are closer to the truth.

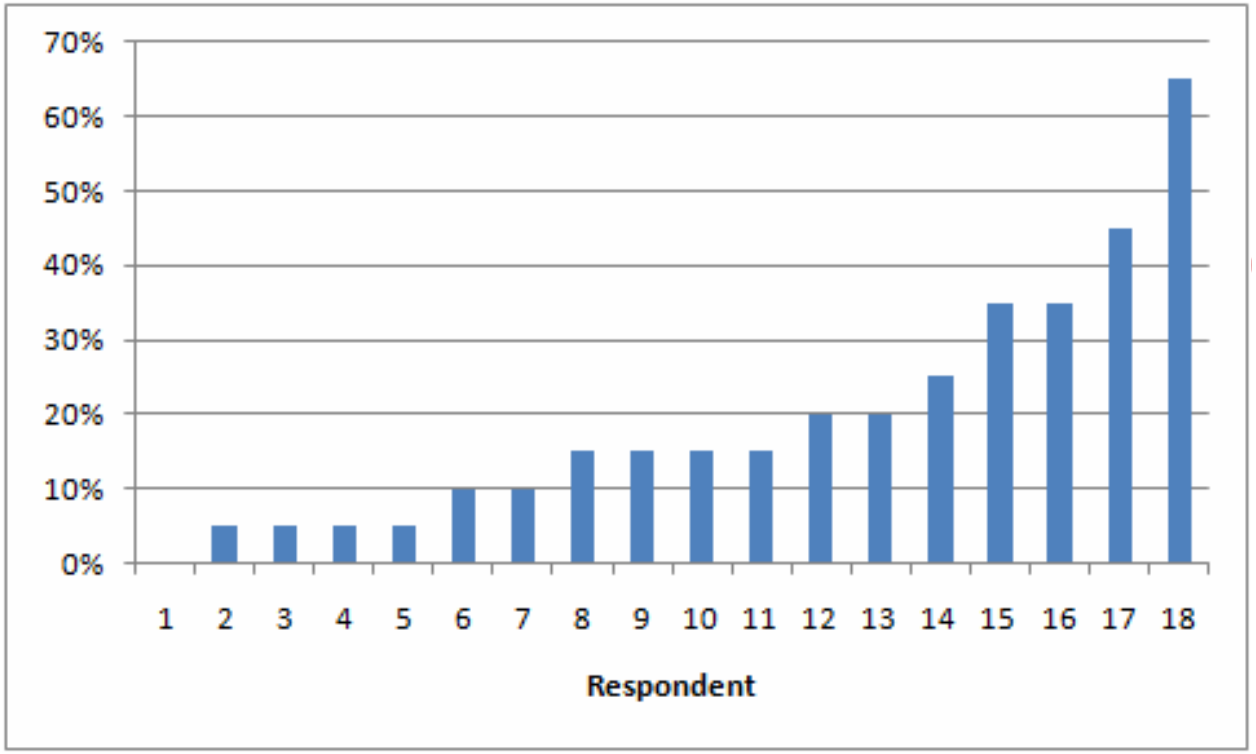
Probability that LEDs will be Widely Available



Will LEDs be Preferred?

Most say LEDs will not be preferred by the majority of customers

Percentage of Customers who Prefer LEDs to CFLs or Min-EISA

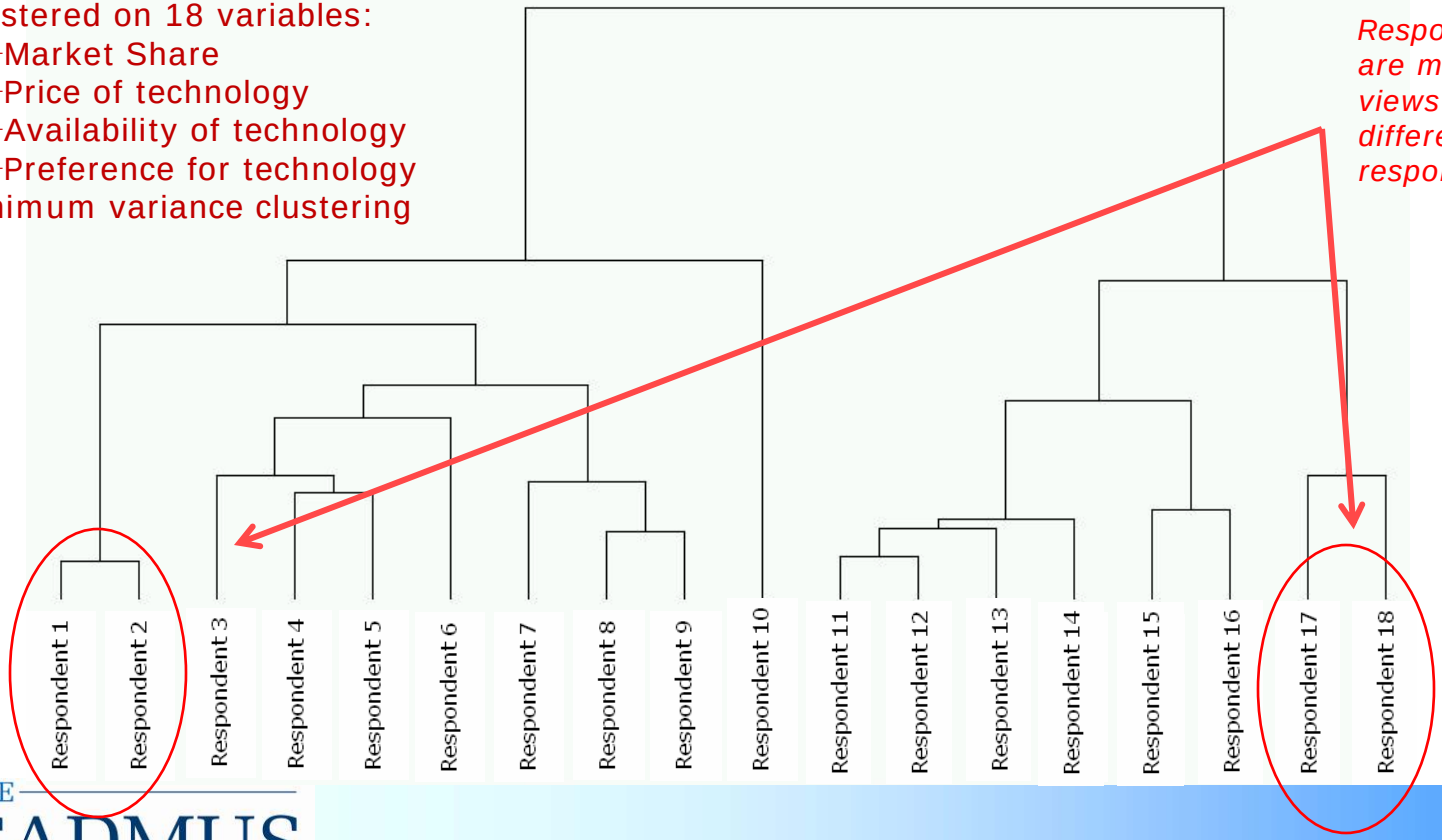


Where are we headed?

Cluster analysis of survey items shows opinion patterns

Clustered on 18 variables:
- Market Share
- Price of technology
- Availability of technology
- Preference for technology

Minimum variance clustering



Respondents 1 & 2 are much alike in their views and very different than respondents 17 &18

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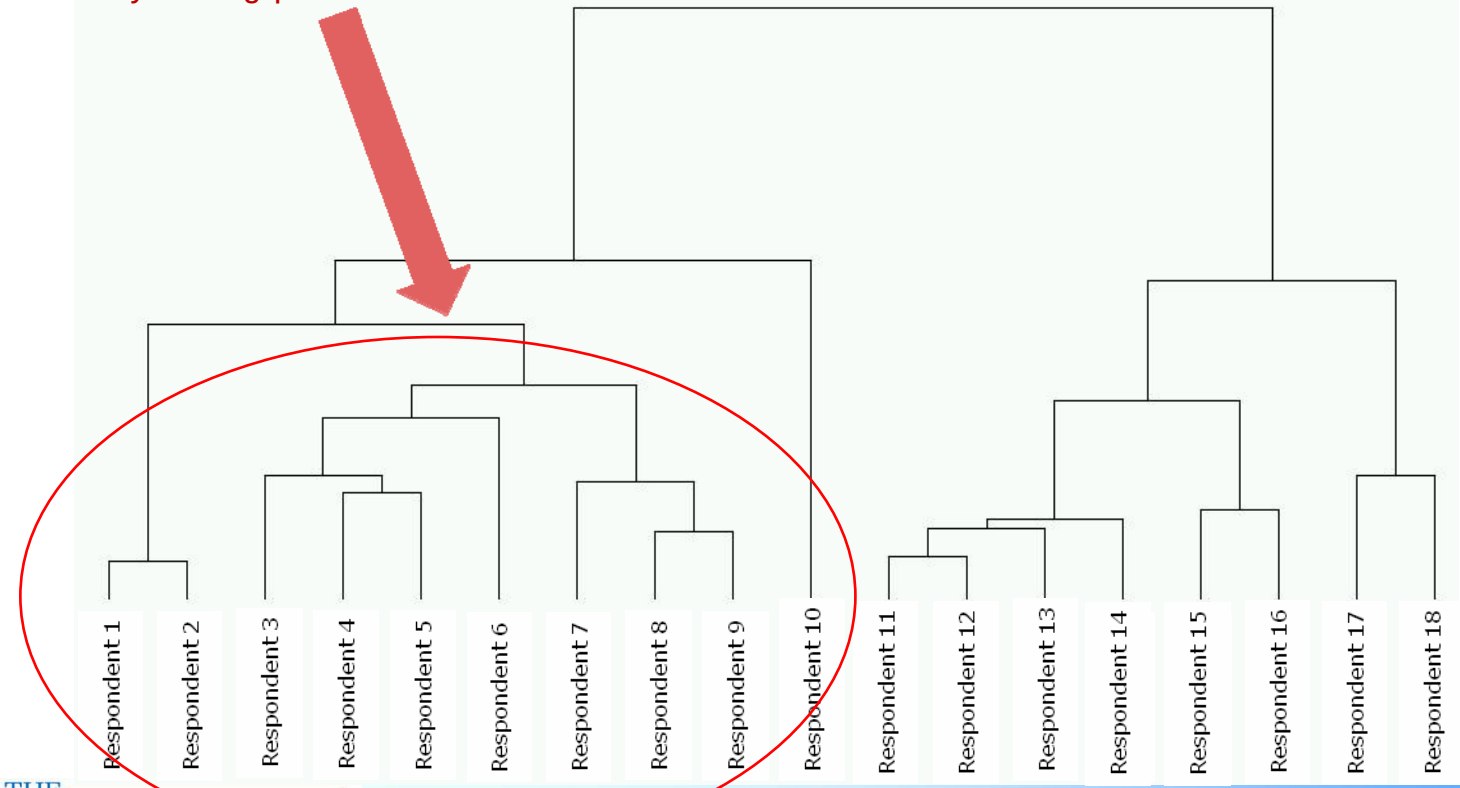
Where are we headed?

- Robust market for CFLs and LEDs
- Weaker market for halogens
- CFLs expensive
- Relatively strong preference for LED



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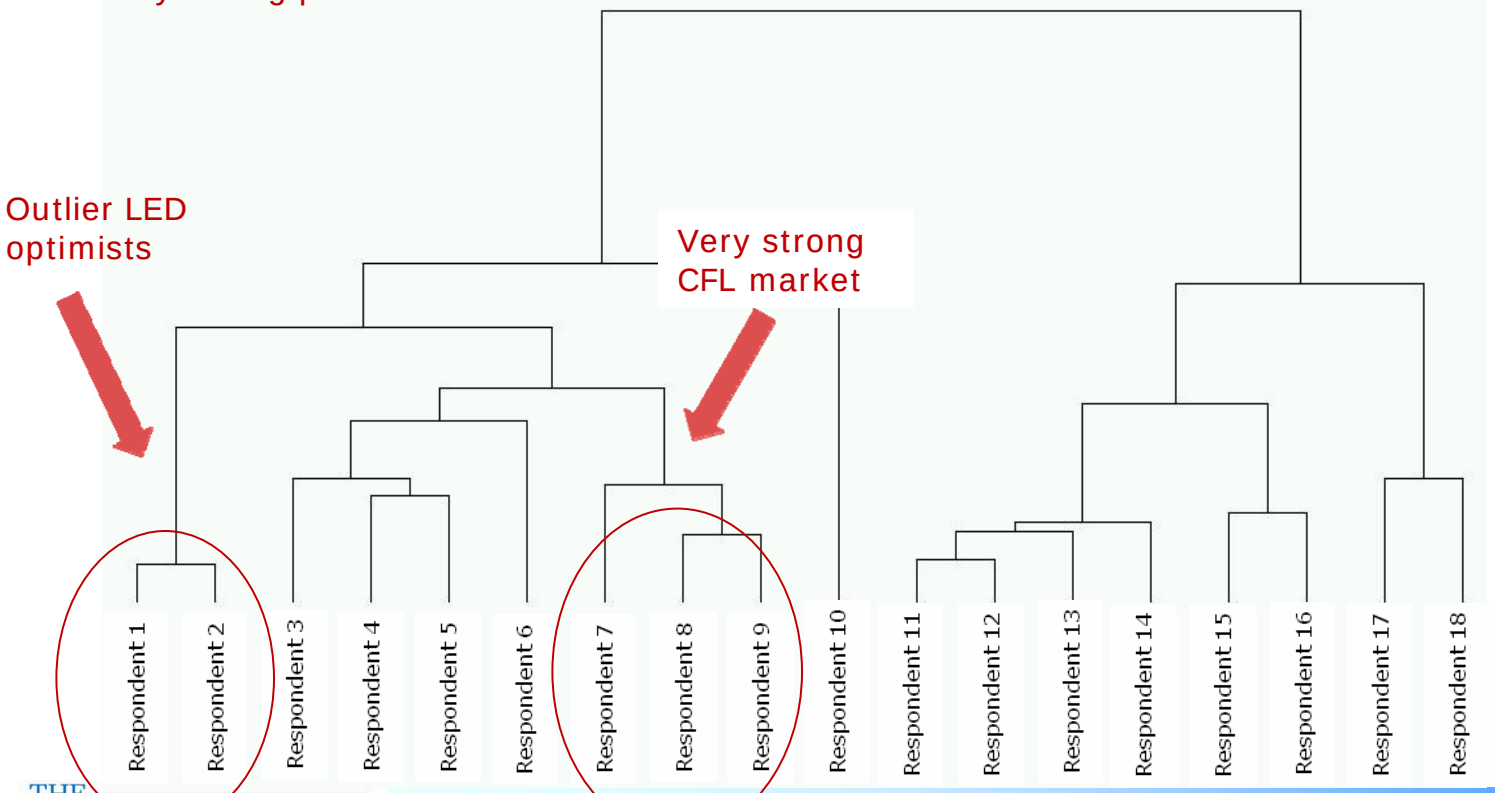

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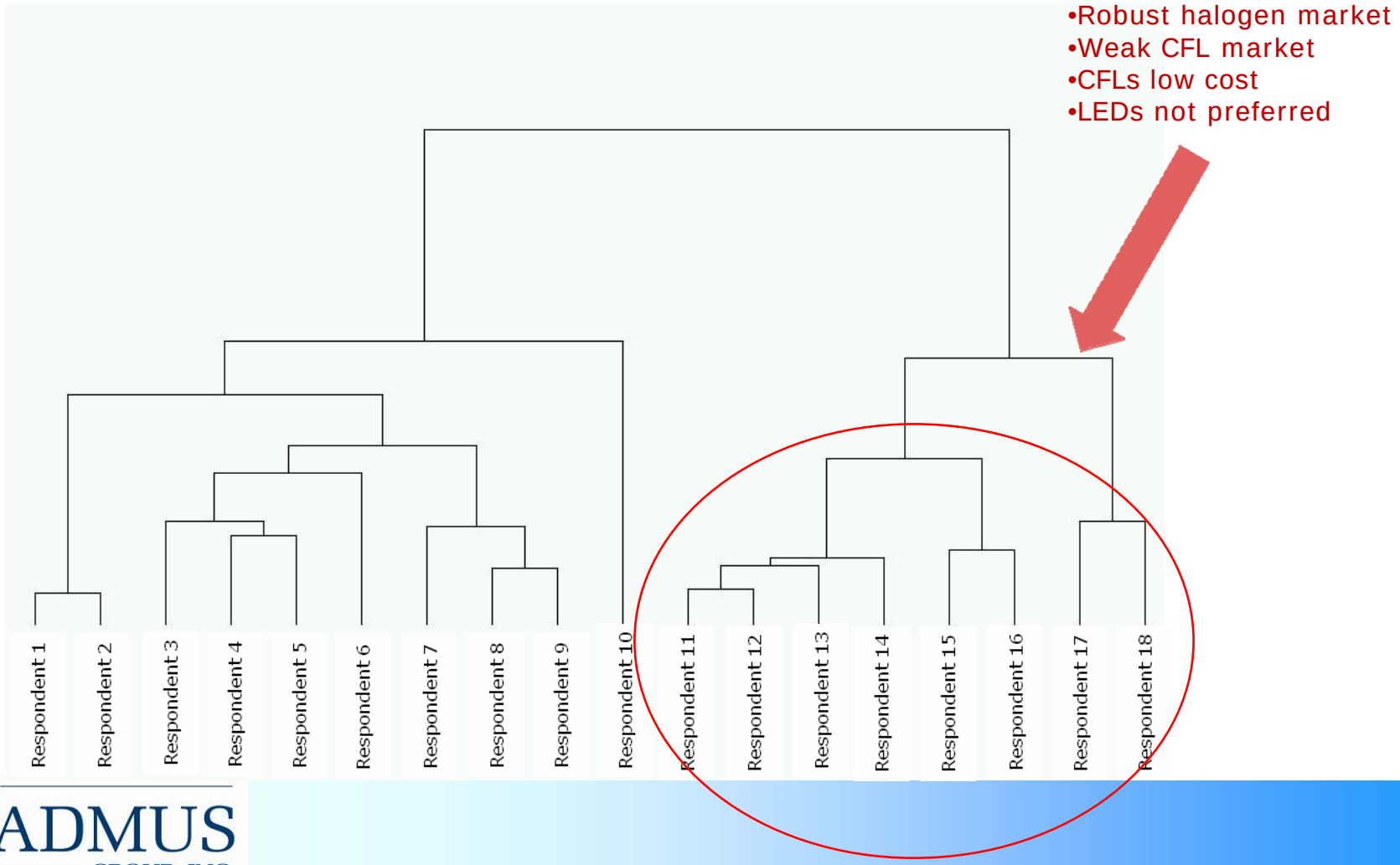

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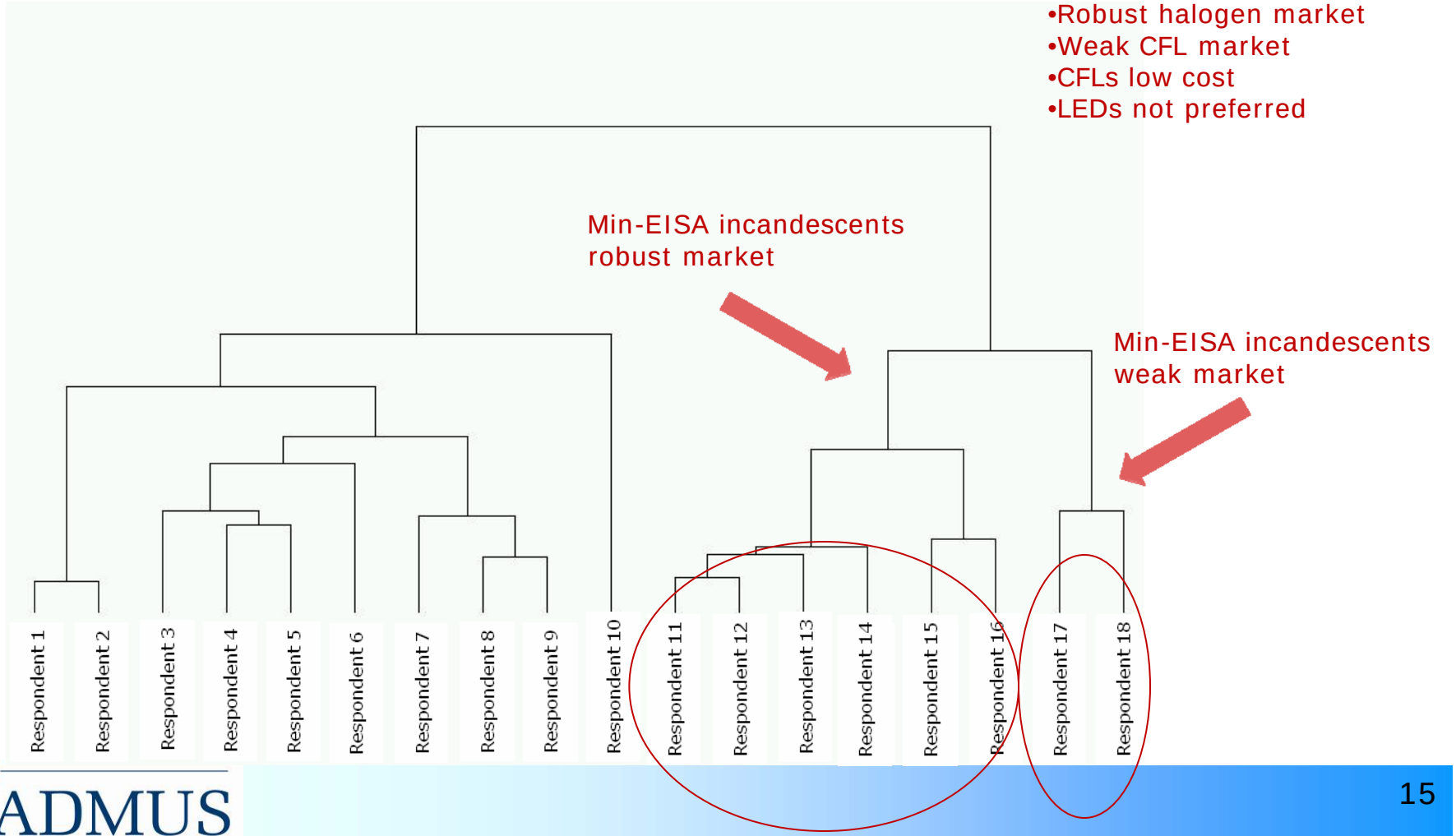
Where are we headed?

- Robust halogen market
- Weak CFL market
- CFLs low cost
- LEDs not preferred



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Results – Most Likely Scenarios

10/18 rate the following outcome most likely:

- Sufficient demand for minimally EISA-compliant bulbs
- Price will be roughly equivalent to CFLs
- Minimally EISA-compliant bulbs will be preferred by purchasers
- Minimally EISA-compliant bulbs baseline technology
- Residential programs continue to promote CFLs in 2012 – 2014

7/18 rate this outcome most likely:

- Will not be significant demand for EISA compliant bulbs
  - Price or customer preferences
- CFLs will be treated as the baseline technology
- Programs will focus on LEDs and CFL specialty in 2012 – 2014

Results – Most Likely Scenarios

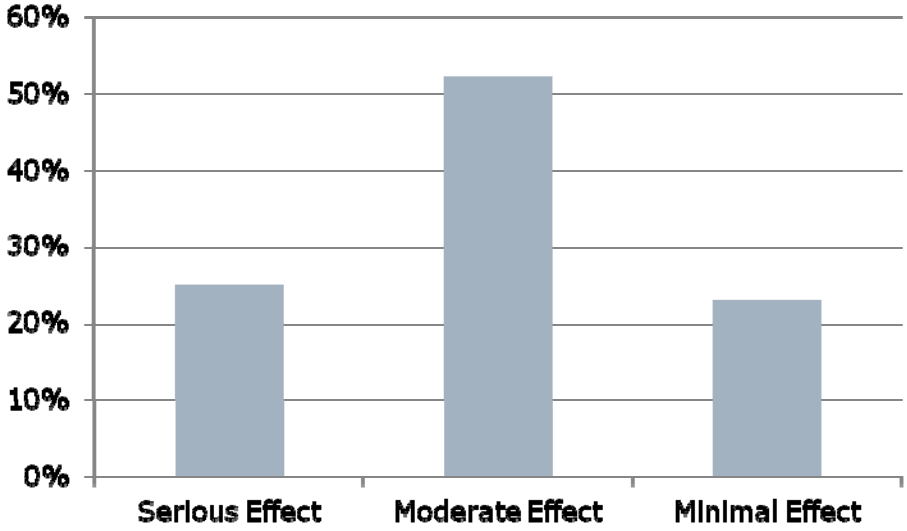
One "third scenario" rated most likely:

Storage will keep standard bulbs in the market for at least 1 to 2 years and these will continue to be the baseline. Part of the baseline will be EISA bulbs. CFLs will not become the baseline as the standard bulbs and EISA will set these, but costs will be up such that TRCs for CFLs will be improved and utilities will get more savings per dollar than they do now.

Net to Gross

Will NTG Have Serious, Moderate, or Minimal Effect on Program Cost Effectiveness?

No strong signal. Respondents played it safe.



Implications – A Mix of Technologies & Applications

- Future lighting programs will include a mix of technologies, applications, and delivery
- More elements of portfolio design (and risk management) will be applied to residential lighting programs
  - Experience with EE program design generally provides valuable information about performance of different types of program delivery and incentives
- The mix will be critical – and changing – matching technologies to services, delivery, providers, and incentives

Simulating Numerous Lighting Program Design Configurations

We will use the Cadmus *Portfolio Pro* application for modeling, theoretically, program screening results

- With varied assumptions for:
  - Measures
  - Incentives
  - Delivery strategies
  - Participation levels
  - Measure life
  - Incremental costs
  - Attribution

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Developing Program Models for Simulation

- First, a characterization of current programs
- Based on a review of *CEE's "Summary of Residential Lighting Programs in the U.S. and Canada" (April 2010)*
- While diversity of lighting products offered by programs has increased somewhat recently, CFLs and fluorescent fixtures continue to dominate residential lighting programs

One Perspective: Three Program "Models"

- Resource acquisition – *streamlined*
  - Usually one delivery strategy (upstream or down)
  - Often focused on just 1-2 measures (e.g., CFL lamps), but sometimes other lamps and fixtures
- Resource acquisition – *comprehensive*
  - A variety of program delivery options, matched with a larger array of lighting product offerings
  - Upstream, mid- and downstream for buy-downs/markdowns/instant, some direct install
- Resource acquisition – *combined with MT*
  - Upstream, downstream, other channels (e.g., community outreach, builders, social marketing, DI)
  - Expanded retail presence, support, and training
  - Diversity in delivery strategies and products

Some Final Thoughts – Managing Program Risk

Lighting programs will need to follow policy framework objectives, e.g., with respect to savings goals and cost-effectiveness

- Within these frameworks, program design objectives can take various forms with specific design elements

- Sponsors will likely emphasize different program risk management strategies for:
  - Technology risk (e.g., emerging technologies)
  - Market risk (e.g., low customer participation)
  - Evaluation risk (e.g., independent EM&V indicates low NTG)