

# So, What Would You Say You Do Here?

Asking the hard questions about attribution with multiple programs

David Barclay | NMR GROUP, INC.  
Lynn Hoefgen | NMR GROUP, INC.  
Kiersten von Trapp | NMR GROUP, INC.

## Background

This poster describes the process by which the Massachusetts Program Administrators (PAs), the Energy Efficiency Advisory Council consultants (EEAC consultants), and the residential retail lighting evaluation team, led by NMR Group, Inc., developed prospective net-to-gross ratios (NTGRs) for light emitting diode bulbs (LEDs). The PAs and EEAC consultants will use these prospective NTGRs to help plan the 2019 to 2021 Home Energy Assessment (HEA) program, a direct install program for LEDs.

Program Year	Effective Useful Life	Upstream Program Ends			
		Dec. 31, 2021 (Base)	Dec. 31, 2018	Dec. 31, 2019	Dec. 31, 2020
2019	3	88%	88%		
2020	2	80%	83%	82%	
2021	2	66%	74%	72%	69%

## Statement of Opportunity

As a consensus process, it was vital that stakeholders be able to provide input into developing estimates.

Required a solution that allowed stakeholders to explore the impact of changing assumptions for key inputs while accounting for complex interaction of programs, naturally occurring market adoption (NOMAD), market movement, and various program goals.

Some of the confounding factors included:

- Rapidly changing market
- High Naturally Occurring Market Adoption
- Multiple program scenarios
- Multiple programs – upstream and direct install
- Replace on failure and early replacement

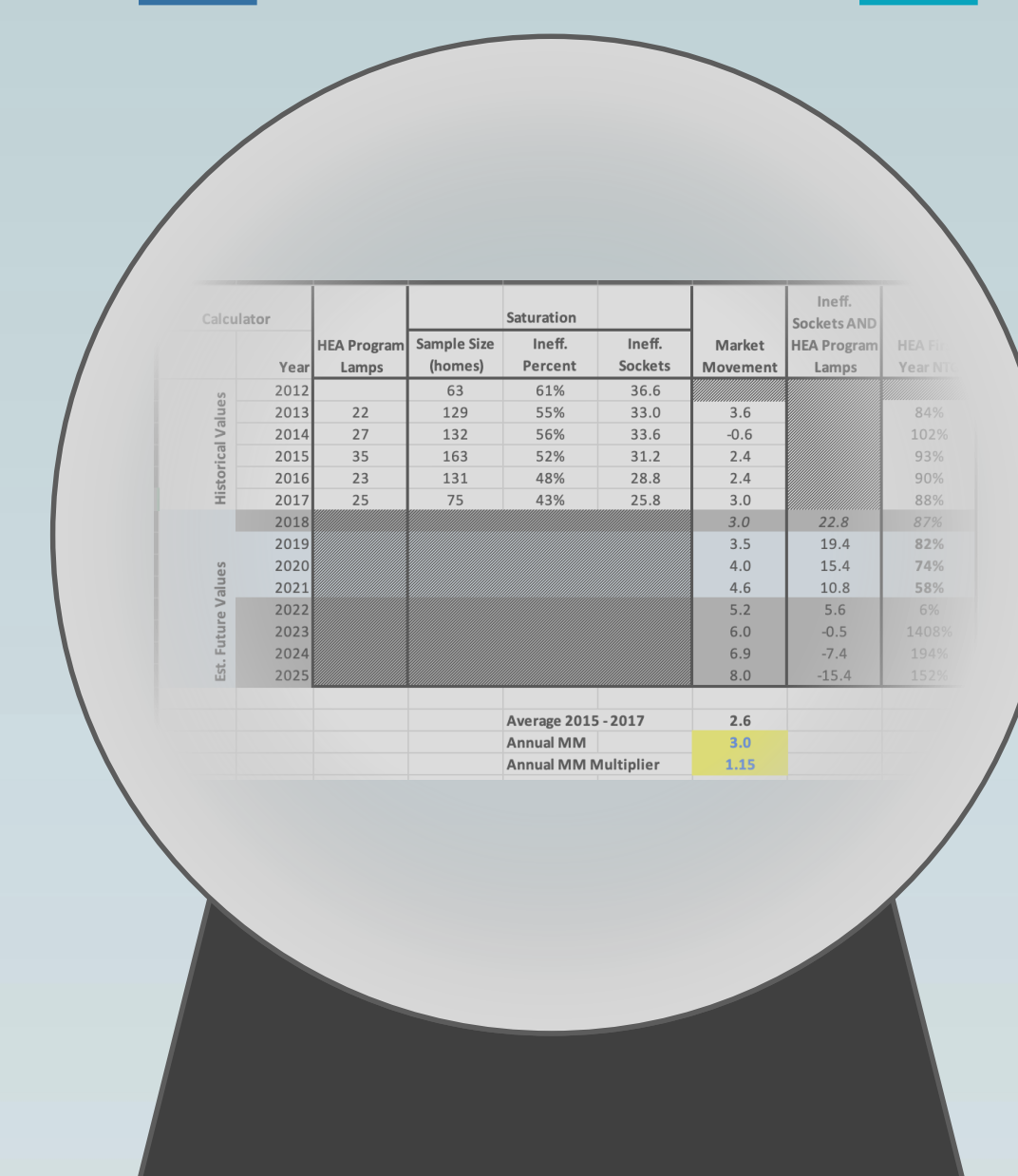
The complexity demanded an approach that simplified the task while providing actionable outcomes.

## Develop Consensus Values

Compiled data on HEA supported LEDs (program records), and historical broader lighting market trends (annual lighting on-site visits). Data were combined in an Excel-based tool that guided the consensus process.

Participants needed to agree on three key inputs:

- **Market Movement:** the average incremental number of efficient lamps installed per home per year (above what was previously installed), leading to a decrease of inefficient lamp saturation on a year-to-year basis. Market movement is a combination of NOMAD and upstream program influence.
- **Escalation of Market Movement:** the degree to which market movement is expected to change over time.
- **Market Movement Attributable to Upstream:** the amount of market movement attributable to the companion upstream program.



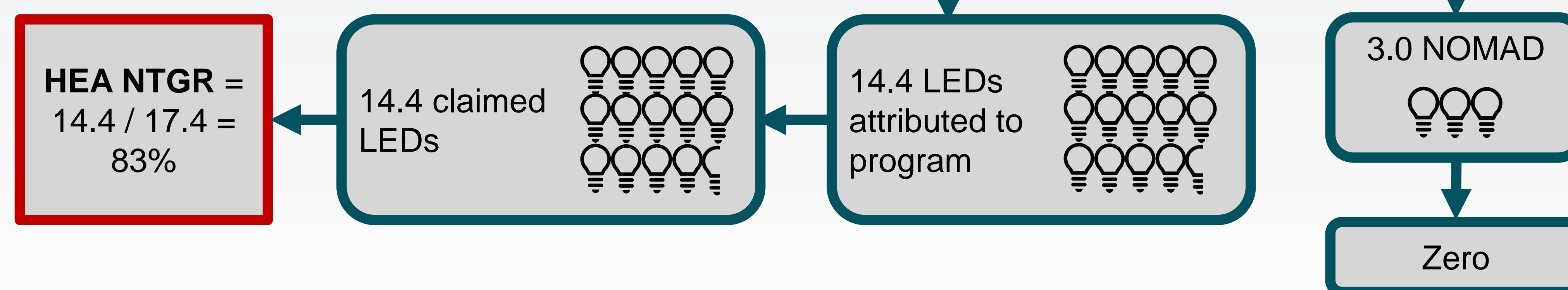
Market Movement

Escalation of Market Movement

Market Movement Attributable to Upstream

## Calculate Prospective NTGR

- Agreeing on a method for calculating prospective NTGRs was the most difficult aspect of the project.
- The group was initially unsure how to treat the portion of market movement attributable to the companion upstream program.
- The group explored and discussed many scenarios before agreement was reached.
- This flowchart illustrates the scenario for NTGR in 2020 if the upstream program ends Dec. 31, 2018.



## Challenges

- Lack of data regarding:
  - Market movement (historical or projected)
  - Program activity (historical or projected)
  - Understanding of program goals
- Lack of agreement on inputs:
  - Only three values need to be agreed upon
  - Treatment of measure attribution
- Wrestling with complicated theoretical issues



## General Application

- The core concepts of market movement, naturally occurring market adoption, and program influence are universal across all programs and end uses.
- The approach and tools provide a roadmap for evaluators and program administrators to use when exploring other end-uses.
- Similar tools may be especially useful for markets with multiple interventions (downstream, midstream, and upstream interventions) or program goals (replace on failure, early replacement, and market transformation).