scout

A Portfolio Impact Analysis Tool for Building Energy Efficiency Technologies

Chioke Harris

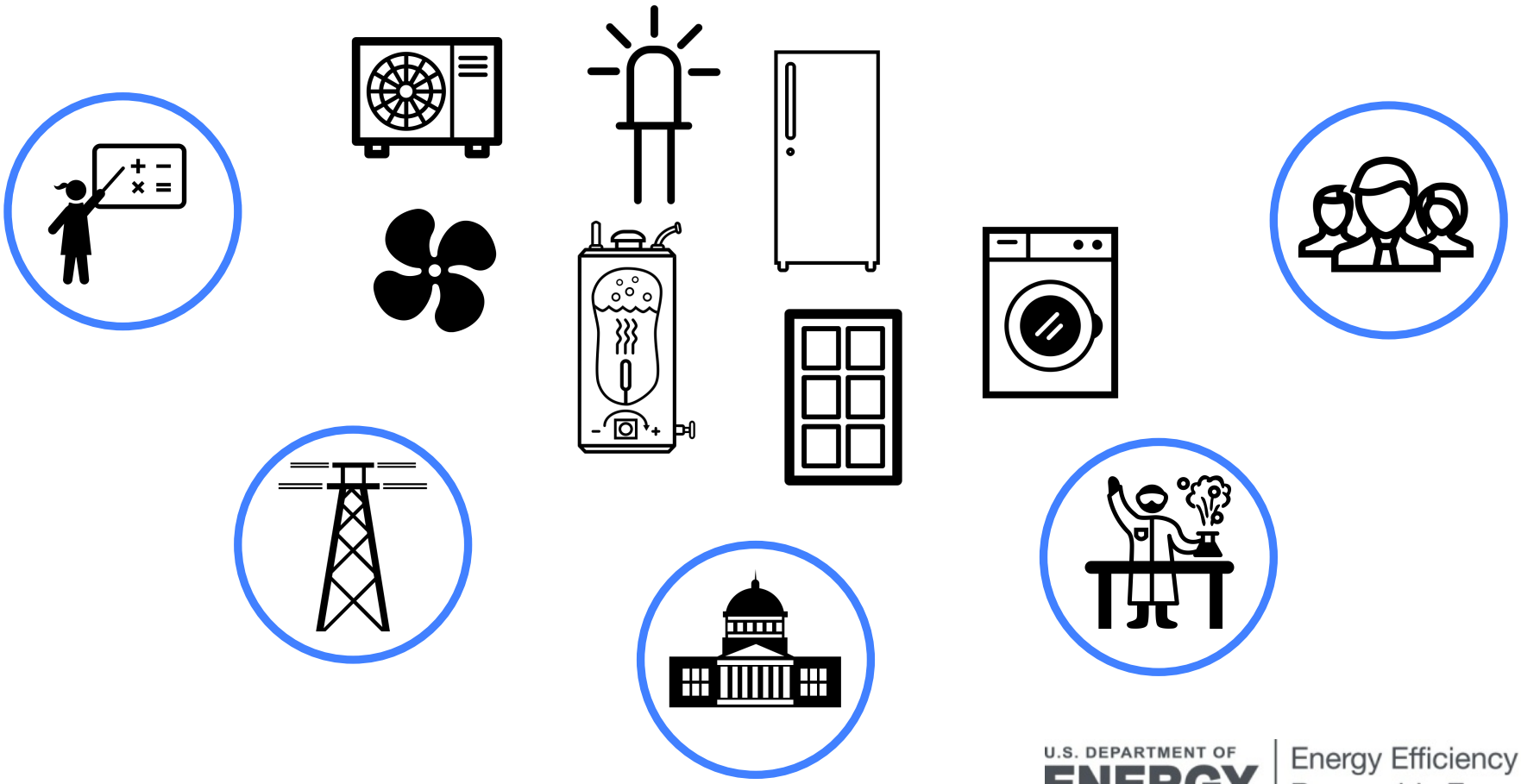
EERE Science & Technology Policy Fellow

Building Technologies Office

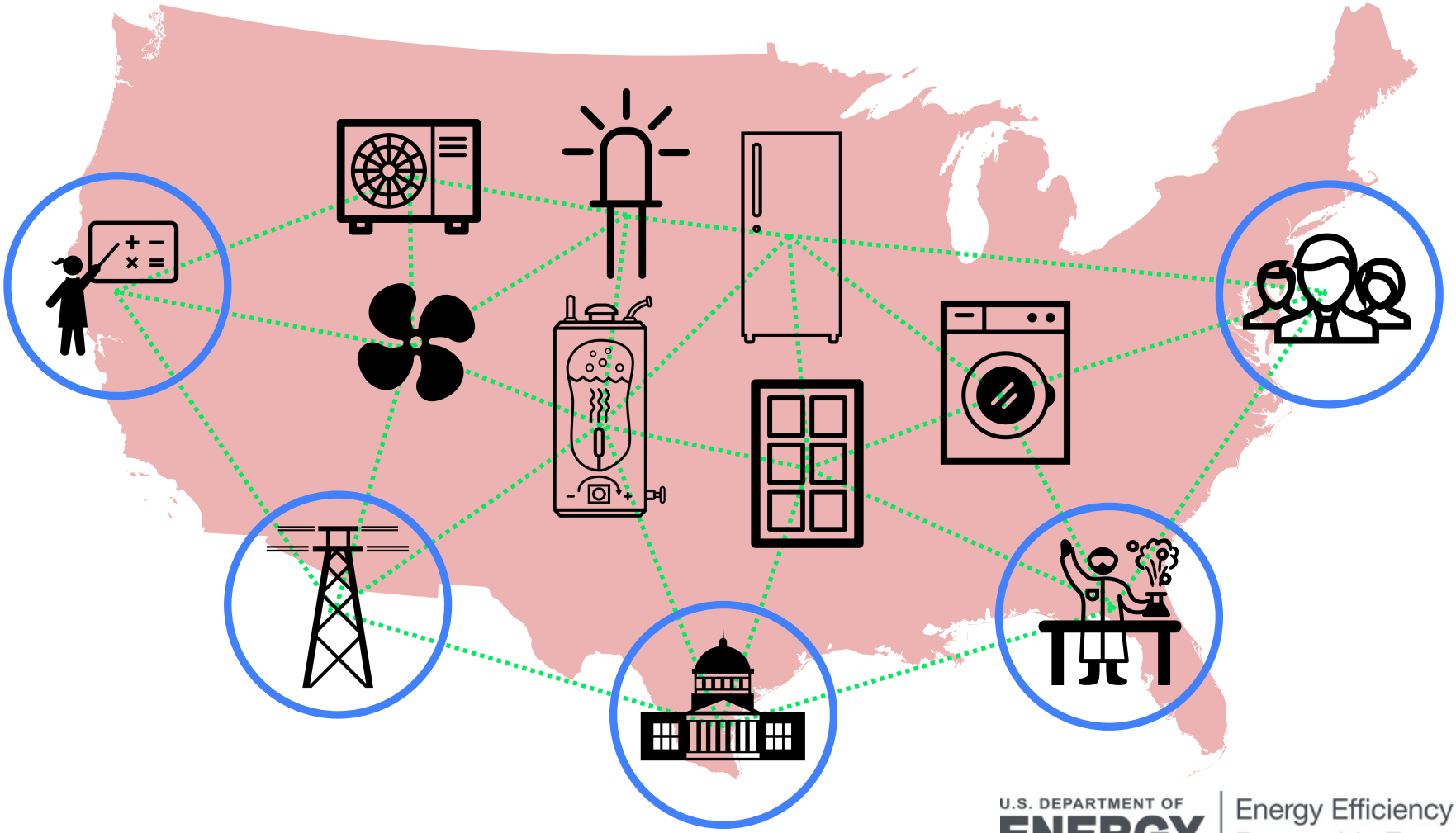
U.S. Department of Energy

U.S. DEPARTMENT OF ENERGY | Energy Efficiency & Renewable Energy

The problem: many efficient technologies, multiple perspectives



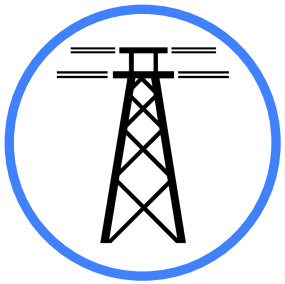
Scout provides a common framework for evaluating energy conservation measures



Scout is intended to be adaptable to the analysis needs of BTO and others

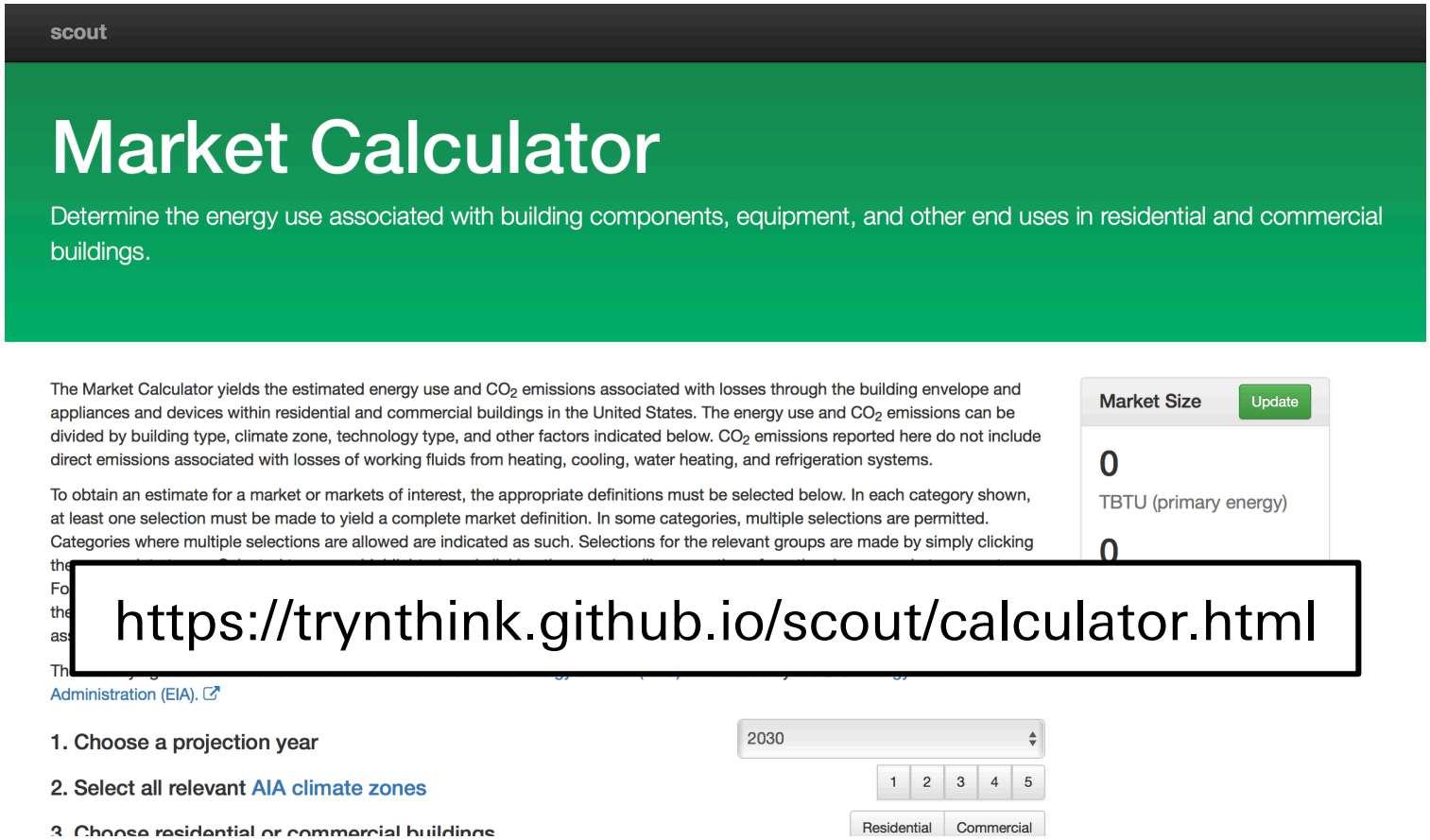
Academics, national labs, and industry partners can use Scout to communicate the larger-scale benefits of R&D breakthroughs

Other Federal agencies can use Scout to estimate the potential impacts of funding in achieving energy and cost savings goals

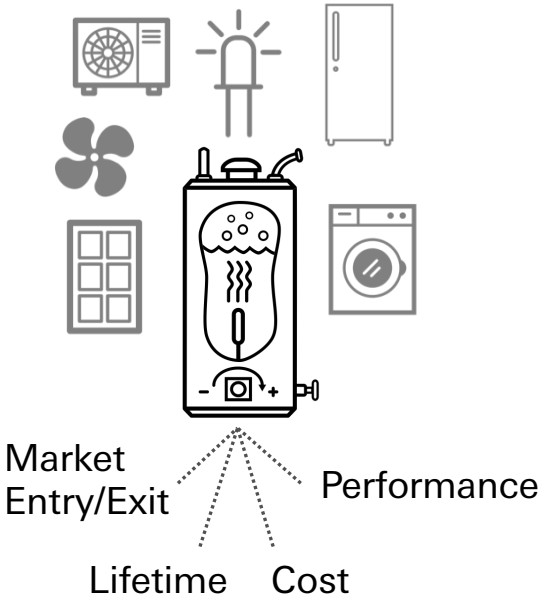


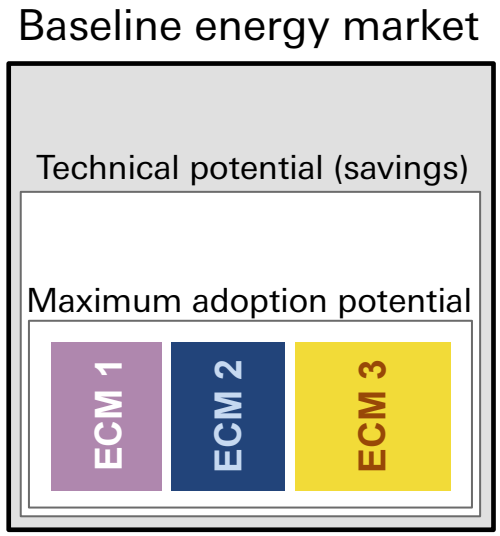
Utilities can use Scout to develop “deemed savings” values and corresponding incentives for energy conservation measures (ECMs)

The Market Calculator website is a component of Scout



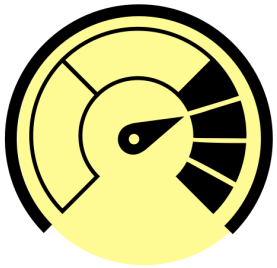
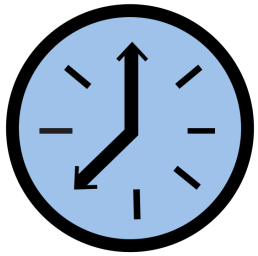
Scout applies individual efficient technologies to the U.S. building stock





Define energy conservation measures (ECMs) → Apply ECMs to baseline energy markets under multiple adoption scenarios → Output U.S. energy reductions and ECM cost-effectiveness

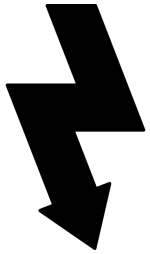
Scout ECMs are defined by performance, cost, and lifetime

 Performance	**Definition:** Per unit absolute (e.g., COP) or relative (e.g., savings %) **Sources:** Reports and publications, EnergyPlus
 Cost	**Definition:** Per unit installed cost **Sources:** EIA, RSMeans, public databases (e.g., ENERGY STAR)
 Lifetime	**Definition:** Useful unit life in years **Sources:** EIA, reports, and publications

ECMs apply to baselines drawn from EIA Annual Energy Outlook

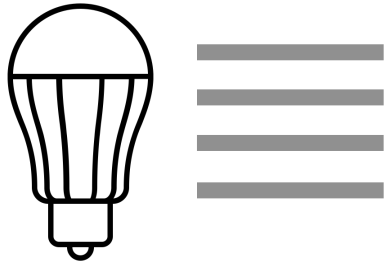
Data reported for each year from 2009 to 2040

Energy Use

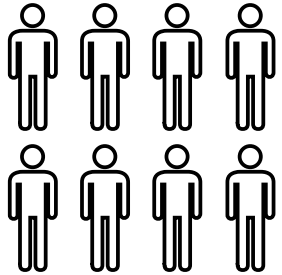


Building Stock

Equipment Characteristics



Adoption Model Parameters



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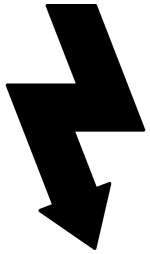

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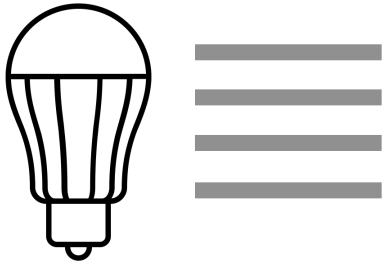
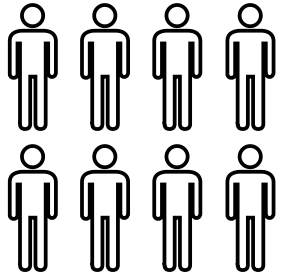
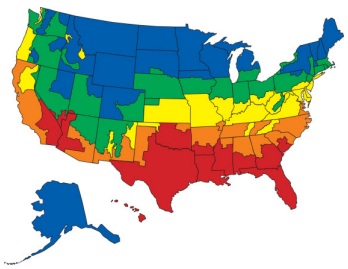


Adoption Model Parameters

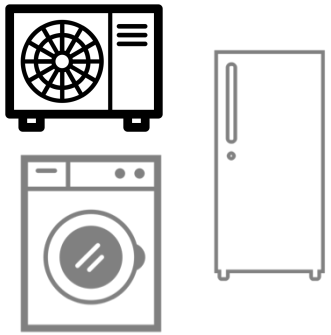


Building Type

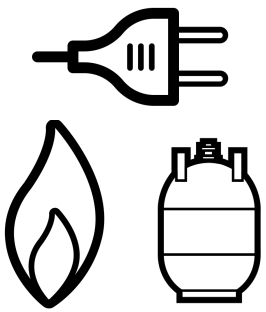
Climate Zone



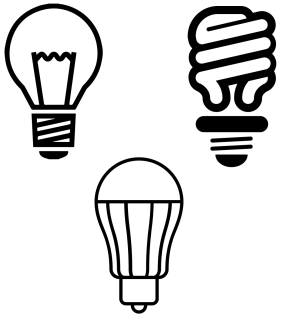
End Use



Fuel Type



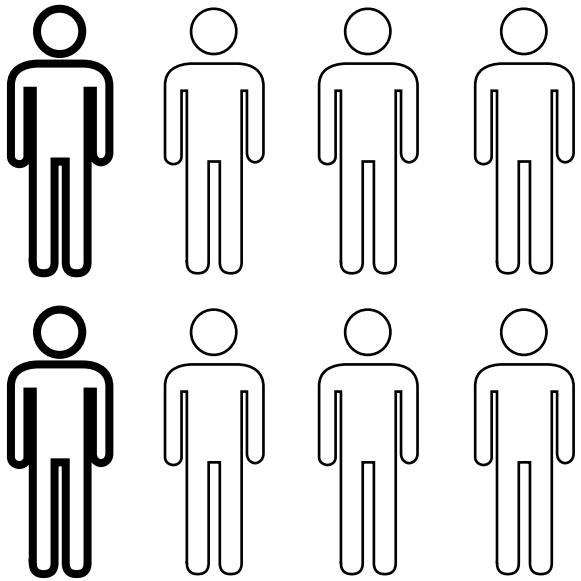
Technology



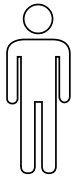
Baseline data define building and equipment stocks and flows

ECMs diffuse into markets under two adoption scenarios

Total baseline market (Year Y)



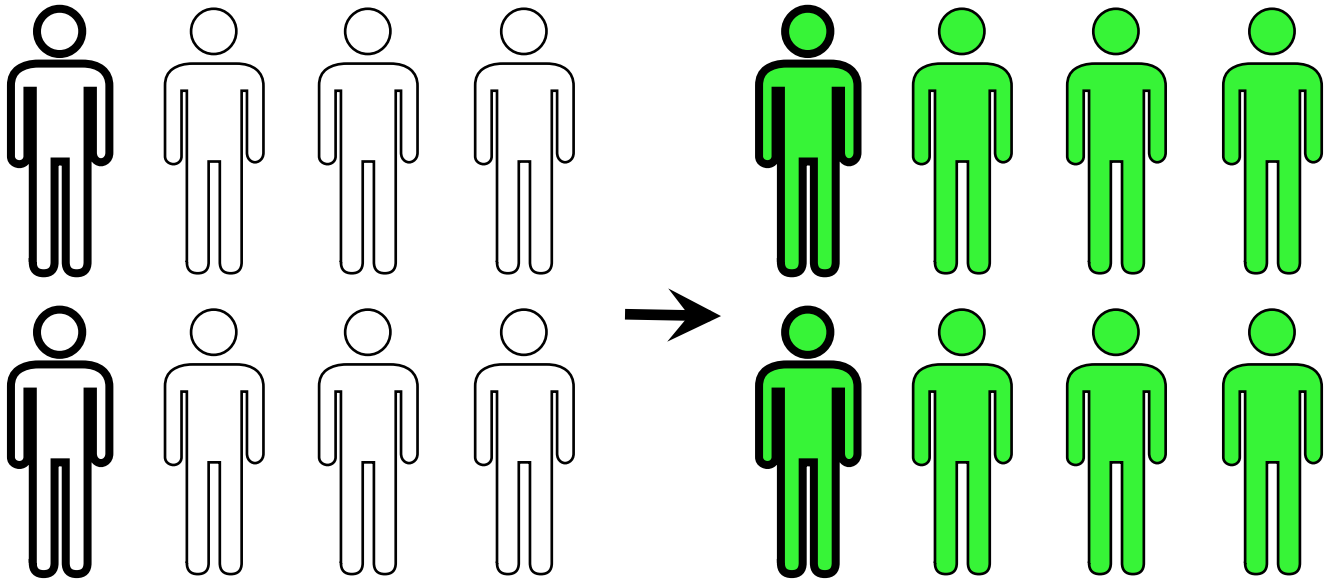
New/replace/ retrofit baseline ('Competed')



Uncompeted baseline

ECMs diffuse into markets under two adoption scenarios

Technical Potential Scenario: Total market fully captured



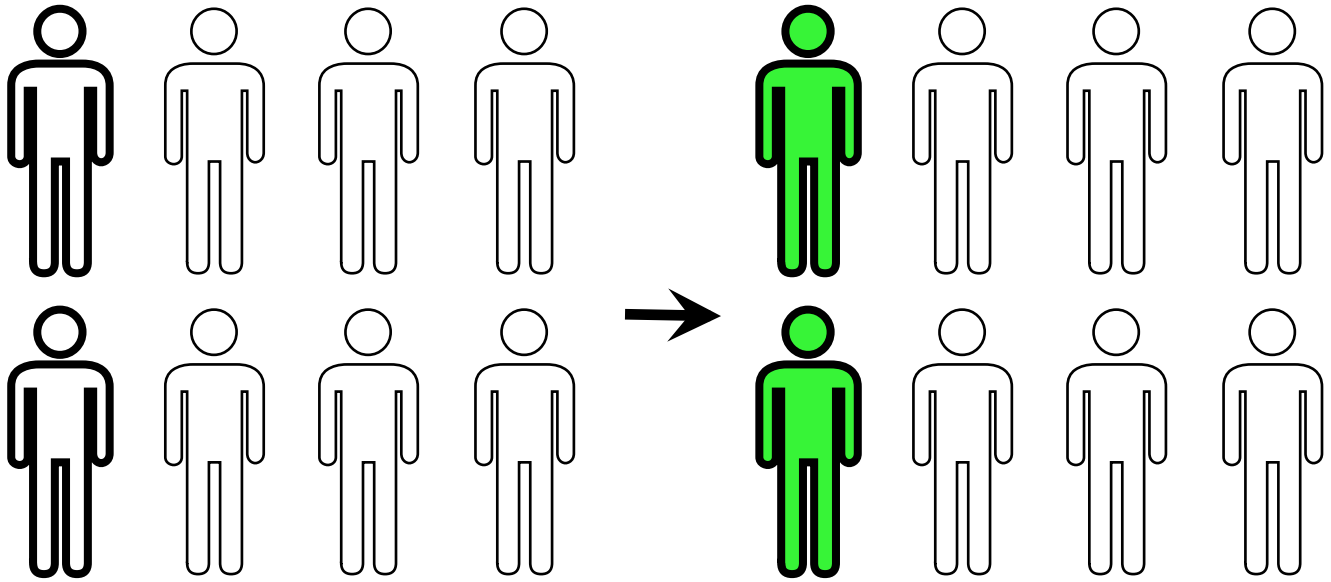
New/replace/ retrofit baseline ('Competed')

Uncompeted baseline

Captured by an efficient measure

ECMs diffuse into markets under two adoption scenarios

Maximum Adoption Scenario: Competed market fully captured

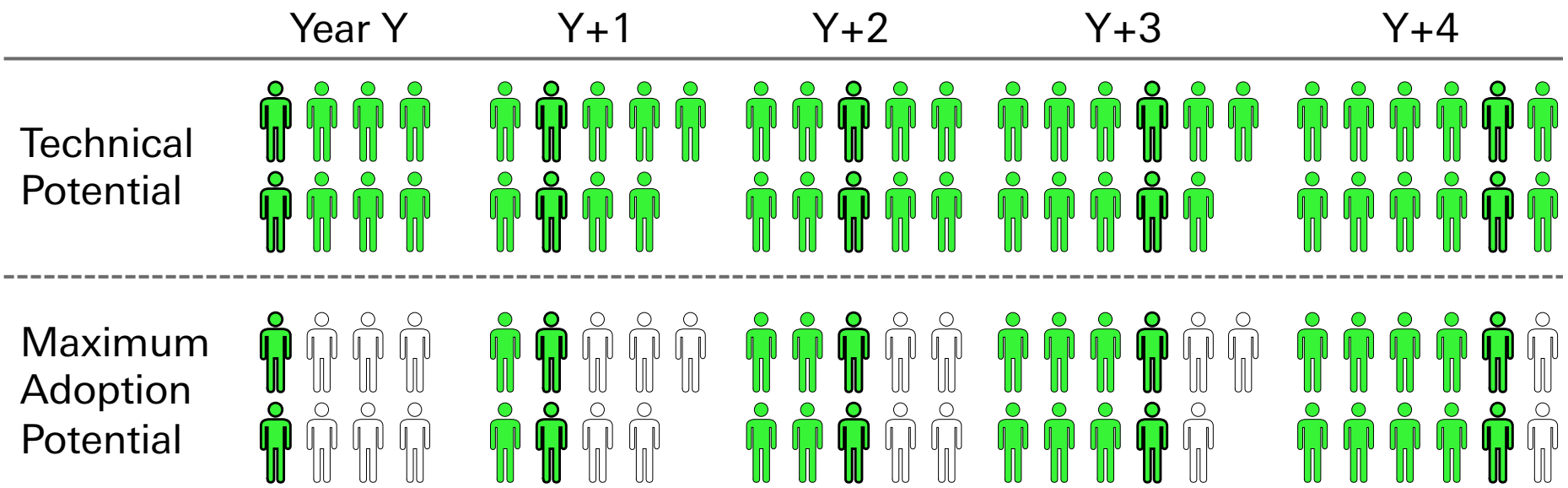


New/replace/ retrofit baseline ('Competed')

Uncompeted baseline

Captured by an efficient measure

Adoption scenarios determine ECM diffusion rates over time

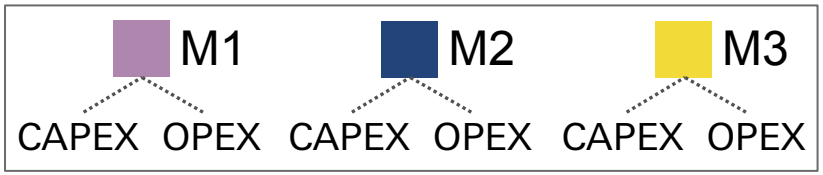


Competed baseline

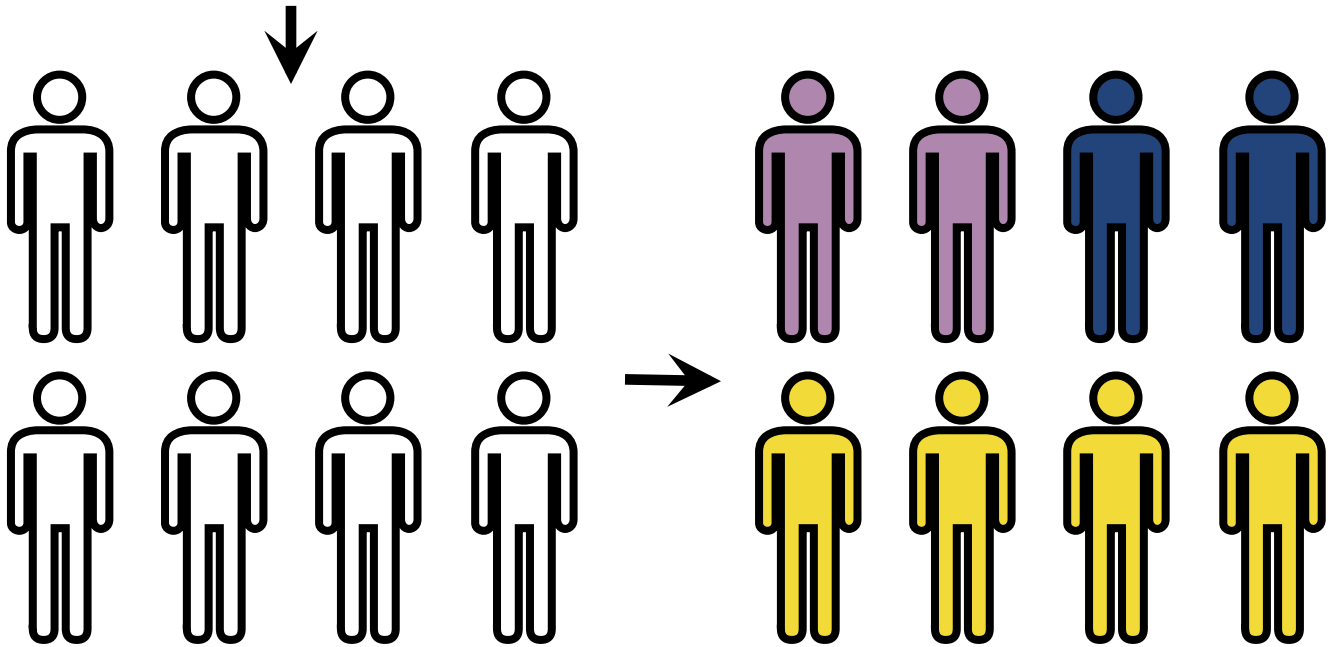
Uncompeted baseline

Captured by an efficient measure

Competing ECMs are attributed shares of the competed baseline



ECM market shares determined by per unit capital/operating costs
*(based on NEMS adoption models)



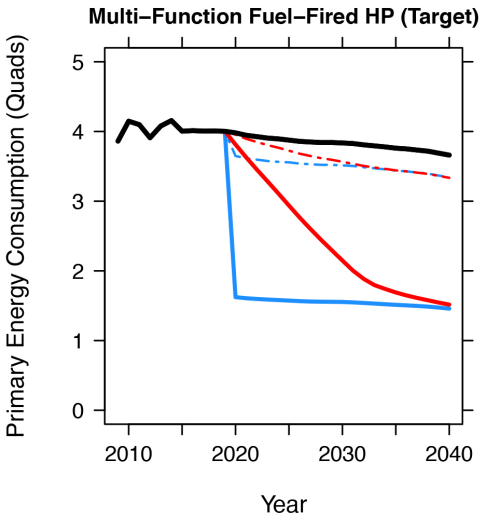

Competed baseline

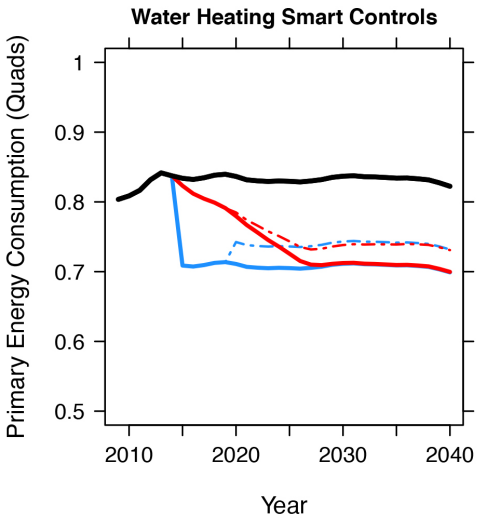

Captured (M1)

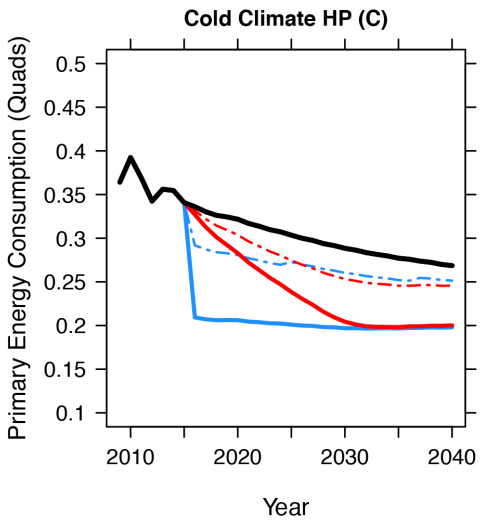

Captured (M2)

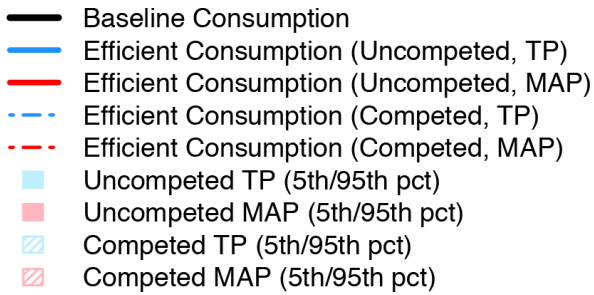
Captured (M3)

Results can show the effect of competition, uncertainty









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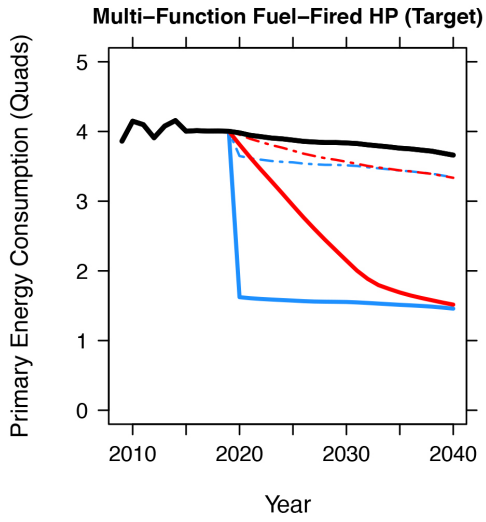
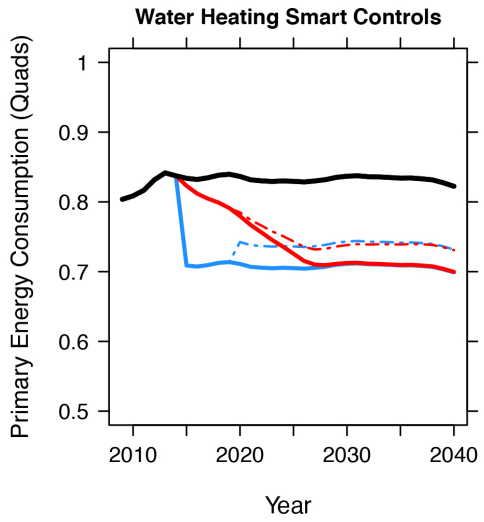
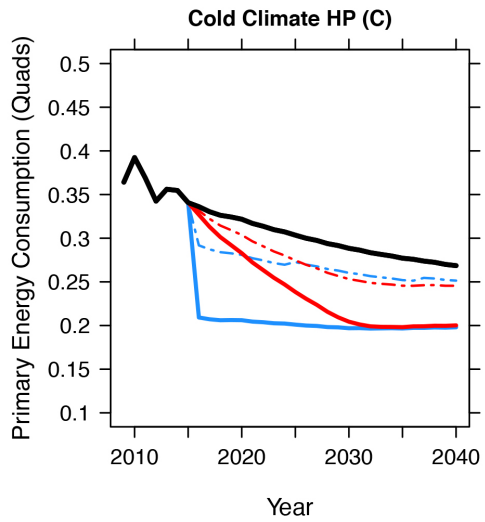
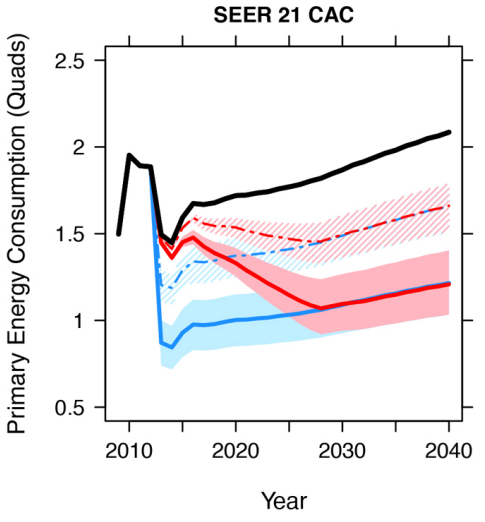
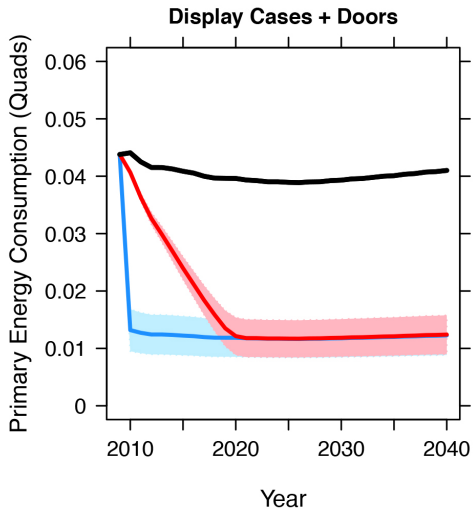
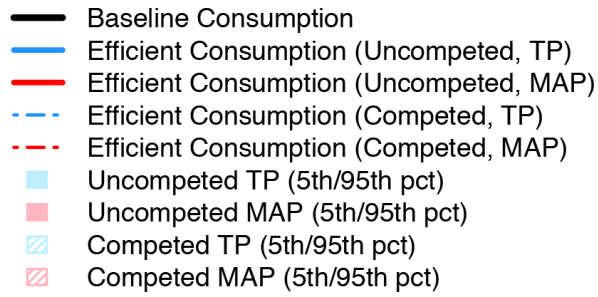






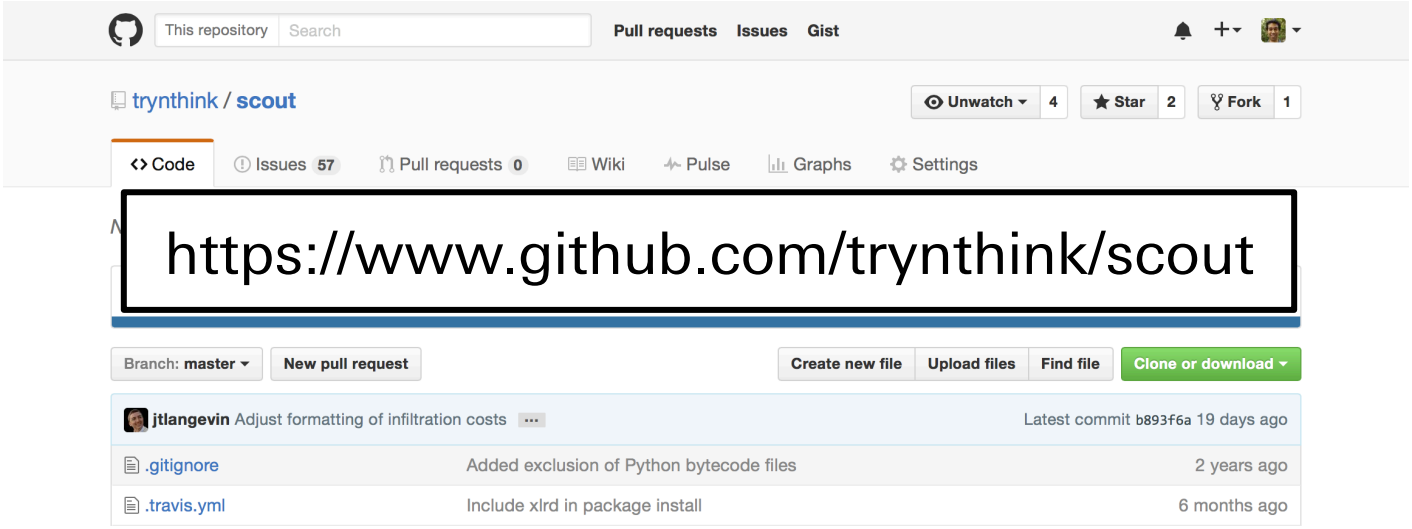






Alpha testing ongoing, beta slated for late 2016

- Residential and commercial measures tested
- Preliminary measure portfolio defined
- Switch to Building America climate zones
- User documentation available online



Chioke Harris, Ph.D.

EERE Science & Technology Policy Fellow
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U.S. Department of Energy

chioke.harris@ee.doe.gov

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Icon attributions

Slide 3: Buildings (Milky-Digital Innovation); US Dollar (Christopher Beach); Lightning bolt (Tristan)

Slide 4: LED (Nikita Kozin); Water heater (Michael Thompson); Air conditioning unit (Arthur Shlain); Fan (Edward Boatman); Refrigerator (shashank singh); Washing machine (Ed Harrison); Window (Arthur Shlain); Teacher (TukTuk Design); Utility tower (Maurizio Fusillo); Capitol building (Kelcey Hurst); Lab scientist (Edward Boatman); Business team (lastpark)

Slide 6: United States (Bohdan Burmich)

Slide 9: Energy dollar (Nicholas Menghini); Power plant (Francesca Ameglio)

Slide 10: Gauge (Nicolas Vicent); Clock (Nadya Bratt)

Slide 18: Energy (Edward Boatman); buildings, Mosque, House (Creative Stall); School (Tran)

Slide 19: Plug (Arthur Shlain); Flame (Samuel Q. Green); Propane Tank (Carlos Salgado); Fluorescent Light Bulb (Matt Brooks); Light Bulb (Marco Galtarossa); led bulb (Alex Podolsky)

Slide 26: Figure (Alexander Smith)

Slide 35: homepage (Lil Squid)

Slide 38: solar panels (Adam Terpening); turbines (Creative Stall); Power Plant (Iconathon); clock (Karen Tyler)

Slide 39: Faucet (Carla Gom Mejorada)

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