External Influences: DOE budget, Spin-off products, Energy prices, Private sector R&D, Market incentives, Legislation / Regulation

Objectives

Activities / Partners

Competitive funding of R&D,

by national labs, industry &

technologies & control systems

testing & validation of

universities

Outputs

Short Term Outcome



Support R&D of next-generation window / film, light redirection, thermal insulation, air sealing & roofing technologies

Improve

reduce

costs

performance &

technologies &

manufacturing

of window &

Accelerate market

entry & acceptance

building envelope

product installation

Improve testing &

cost of near-term

Competitive funding to develop infiltration diagnostic systems

Shared R&D funding with industry on manufacturing processes with emphasis on cost reduction

Competitive funding to field demo & benchmark savings & comfort impacts with industry

Shared R&D funding of technology installation & verification with industry

Competitive & shared funding to develop test protocols to support industry ratings & certifications

Competitively funded projects to model attachments in window software tools

Technology pathways & research reports

Prototypes that improve technical performance of materials, components, products

Prototypes that reduce cost or add benefit to technology or controls & system integration.

Manufacturing process & assembly solutions with emphasis on cost reduction

Documented low cost infiltration measurement methods

Window & product performance & market data (e.g., to support EPA's Most Efficient Program)

Improved installation & verification techniques (ease, time to install, effectiveness)

Standardized simulation & testing protocols

Software tools that accurately evaluate window attachments Fenestration, insulation & roofing industry equipped with validated solutions that can improve products & reduce their cost

Manufacturers aware of new or improved technologies & equipped with reduced cost production solutions

Building professionals have access to installation & performance verification techniques

Building professionals have easy to use & accurate energy modeling tools to improve building design & assembly

Government & industry have modeling tools, test & simulation protocols to support product ratings & certifications

Industry develops higher efficiency & lower cost products & systems that can reduce energy lost through building enclosures

Manufacturers produce improved window & envelope products at a reduced cost & bring them to market

Building professionals support, easily install & verify performance of high efficiency building enclosure products

Government, standards & industry orgs. & EE programs use energy modeling to differentiate product performance as a basis for market incentives, standards & energy codes

High-efficiency window & building envelope technologies are regularly developed & produced by industry; correctly installed by building

professionals; &

have similar or

better installed

cost, comfort &

aesthetic value

relative to

products.

conventional

modeling capabilities, including window design tools to enable market adoption

> Meet cost & performance targets by 2020 to enable windows & envelope technologies that will be capable of reducing heating & cooling primary EUI 60%

Enable the development of cost-effective technologies that will be capable of reducing bldg. EUI 30% by 2020

Reduce EUI in all bldgs. 30% by 2030



Windows and Building Envelope Research and Development Logic Model

| OBJECTIVE | ACTIVITIES | KEY OUTPUT | SHORT-TERM OUTCOME | MID-TERM OUTCOME | LONG-TERM OUTCOME |
|-------------------------------|--|---|--|--------------------------------------|---|
| Develop next-gen tech | Performance & infiltration R&D Cost reduction R&D | Tech reports Next-gen prototypes Cost reduction methods | Improved materials Manufacturing improved | Lower-cost, more efficient | |
| Accelerate market entry | Installation R&D Test, demonstrate & | Installation techniques Performance & | Techniques & data accessible | Industry supports efficient products | Advanced windows & envelope tech and tools in |
| Improve modeling tools | Develop test protocols Improve software tools | Standardized test protocols Comprehensive modeling tools | Tools aid product rating & building design | Tools enable incentives and codes | the market |
| | | | • DOE Budget | RNAL INFLUI Legislat | INCES ion / Regulation |

- DOE Budge
- Spin-off Products
- Market Incentives
- Legislation / Regulation
- Energy Prices
- Private R&D