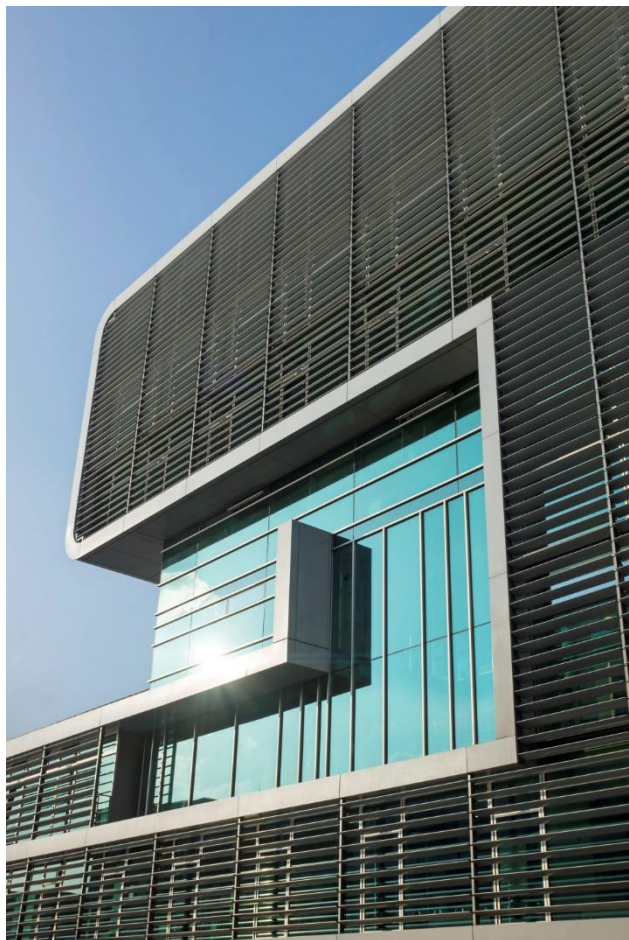


Certification and Rating of Attachments for Fenestration Technologies

2016 Building Technologies Office Peer Review



U.S. DEPARTMENT OF
ENERGY

Energy Efficiency &
Renewable Energy

Ralph Vasami, rvasami@wcmnet.org
Window Covering Manufacturers Association

Project Summary

Timeline:

Start date: 10/01/2014

Planned end date: 09/30/2018

Key Milestones

1. Attachments Energy Rating Council (AERC) established and Committees formed: 6/30/2015
2. Energy performance ratings developed and approved for Phase 1 products: 6/30/2016
3. Product database and website “Go Live” and ready for Phase 1 products: 9/30/2016

Budget:

Total Project \$ to Date:

- DOE: \$368,910
- Cost Share: \$362,513

Total Project \$:

- DOE: \$1,600,000
- Cost Share: \$1,635,000

Key Partners:

Window Coverings Manufacturers Association (WCMA)
Kellen Company
D+R International
Intertek-ATI
Lawrence Berkeley National Laboratory (LBNL)

Project Outcome:

Develop an energy performance rating, certification, labeling and performance verification program for residential and commercial window attachments. AERC will also deliver and maintain a publicly available, searchable website (and database) of certified window attachment product performance, including energy performance.

Purpose and Objectives

Problem Statement:

- DOE has funded development of advanced window technology, testing and simulation (low-e coating, WINDOW, etc.) for the past 30+ years and has funded development of the National Fenestration Rating Council.
- Windows contribute substantially to residential and commercial building energy consumption (Residential – 2.57 quads, Commercial – 1.71 quads)*.
- Cost of window replacement can be prohibitive for consumers. Cost also means replacement is infrequent, so many consumers remain with inefficient windows.
- Consumers need to have options since full window replacement is not always possible, nor the optimal solution (cost, timing, historical preservation).
- Window attachments can be a cost-effective option, but there is no standard method to assess or allow consumers to compare the energy performance of window attachment products.

*BTO Source: Sawyer, K. *Windows and Building Envelope Research and Development: Roadmap for Emerging Technologies*. Washington, DC: U.S. Department of Energy, 2014. Accessed Mar. 14, 2016. http://energy.gov/sites/prod/files/2014/02/f8/BTO_windows_and_envelope_report_3.pdf.

Purpose and Objectives

Target Market and Audience:

- Residential and commercial buildings sector – consumers (homeowners and renters), building owners and managers, utilities, architects, designers – enable them to make more informed choices about window attachments.
- 69% of households have single pane or double pane clear glass windows.¹
- Field and modeling studies show that efficient attachment products can generate residential energy savings between 5 – 33%.²
- DOE estimated insulated and reflective window attachments could save nearly 800tBtu by 2030 across residential and commercial sectors.³

1. Cort, K. 2013. *Low-E Storm Windows: Market Assessment and Pathways to Market Transformation*. PNNL-22565. Richland, Wash: Pacific Northwest National Laboratory.

2. Cort, K. 2013. *Low-E Storm Windows: Market Assessment and Pathways to Market Transformation*. PNNL-22565. Richland, Wash: Pacific Northwest National Laboratory.; National Trust for Historic Preservation. 2012. *Saving Windows, Saving Money: Evaluating the Energy Performance of Window Retrofit and Replacement*.

3. *Building Technologies Office*. 2016. *Multi-Year Program Plan Fiscal Years 2016-2020*. Washington, DC: U.S. Department of Energy.

Purpose and Objectives

Impact of Project

1. Project Output

- Product certification label and ratings that enable consumers to compare the energy performance of different attachment products.
- Publicly available and searchable database and website of AERC-certified products.

2. Project Contribution

– Near-term Outcomes

- Develop energy performance ratings for residential and commercial window attachments.
- Launch the Certified Products Website and Certified Products Database in September 2016.
- Roll out the AERC label in major retailers by June 2017.

– Intermediate Outcomes

- Financial self-sufficiency for AERC.
- ENERGY STAR product category for window attachments.
- Utilities adopt window attachments as an energy-saving measure.

– Long-term Outcomes

- Transform the window attachments market to more efficient products.

Approach

- Technical:
 - Develop energy performance ratings for residential and commercial window attachment products.

Attachment	Product Category Major Sub-Types				Product Phase
	Interior	Exterior	Fixed	Operable	
Cellular Shades	X			X	1
Slat Shades	X			X	1
Roller Shades	X			X	1
Storm Windows	X	X	X	X	1
Solar Screens		X	X		1*
Awnings		X	X	X	2
Roller Shutters		X		X	2
Window Quilts	X			X	2
Drapes	X			X	3
Louvered Shutters	X	X		X	3
Surface Applied Films	X	X	X		If needed
Roman Shades	X			X	3
Pleated Shades	X			X	1*
Sheer Shades	X			X	If needed

Approach

Overall Approach:

- Marketing/Outreach
 - Raise awareness of window attachments technology and energy savings potential to the public.
 - Communicate energy performance to consumers in a simple and effective way.
- Certification
 - Offer consistent, accurate, and comparable data that is publicly available through an electronic database and website.

Approach

Key Issues:

- Develop method to ascertain and compare product performance.
- Consumer awareness of window attachments as an energy-savings measure.

Distinctive Characteristics:

- Public-private collaborative effort.
- Bring together manufacturers, national laboratories, and efficiency organizations to further project goals.
- First time window attachments will have standardized energy-performance ratings.

Progress and Accomplishments

Accomplishments:

- Formed organization - Board of Directors and committees.
 - Board of Directors has majority public interest representation.
- Held first Annual Members Meeting in Washington, DC.
- Stakeholder agreement on prioritized list of products for rating, labeling, and certification.
- Launched organizational website.
- Held Rapid Prototyping Session in June 2015 at LBNL.
- AERC 1 (Procedures for Determining Energy Performance Properties of Fenestration Attachments) in final stages of development.
- Stakeholder outreach has yielded international cooperation (European Solar Shading Organization and Blind Manufacturers' Association of Australia).

Progress and Accomplishments

Market Impact:

- Presented at 3 major national energy efficiency conferences to raise awareness of window attachments as an energy savings measure.
- Plan to conduct outreach to efficiency organizations in the coming year to increase awareness and start pilot projects.
- Limited direct market impact at this time since the program is still being created.

Progress and Accomplishments

Awards/Recognition: None at this time.

Lessons Learned:

- Building a well structured organization with a strong membership base takes time, but is essential for long-term success.
- Building the business model for the commercial market and determining how to monetize data is more involved that first realized.

Project Integration and Collaboration

Project Integration:

- Diverse membership that unites manufacturers, public interest groups, and energy efficiency organizations.
 - 38 total members
 - Annual in-person member meeting
 - The membership drives work on technical, marketing, and certification program.
- Engagement with energy efficiency stakeholders:
 - Association of Energy Service Professionals (AESP)
 - American Council for an Energy Efficient Economy (ACEEE)
 - European Solar Shading Organization (ES-SO)
 - ENERGY STAR
 - Consortium for Building Energy Innovation (CBEI)

Project Integration and Collaboration

Partners, Subcontractors, and Collaborators:

Organization	Role
WCMA	<ul style="list-style-type: none">• Oversee and coordinate the development of AERC.• Manage the project budget and reporting to DOE.• Ensure milestones in the DOE Statement of Project Objectives (SOPO) are met.
Kellen Company	<ul style="list-style-type: none">• Manage development of AERC program, AERC, and WCMA.• Provide staff support to committees and working groups.
D+R International	<ul style="list-style-type: none">• Manage AERC program development and provide strategic guidance and support.• Provide staff support to committees and working groups.• Engage with stakeholders.
Intertek-ATI	<ul style="list-style-type: none">• Develop AERC certification program guidelines and requirements.• Provide independent testing, product certification, and quality assurance.
LBNL	<ul style="list-style-type: none">• Develop simulation and modeling procedures.• Maintain Complex Glazing Database.• Test methods and simulation procedure development.• Product modeling and optical and thermal property.

Project Integration and Collaboration

Communications:

- Presentations at window attachments industry and energy efficiency conferences and events:
 - Building Envelope Stakeholders Meeting
 - Better Buildings Technology Conference
 - Consortium for Energy Efficiency (CEE) Industry Partners Meeting
 - Greenbuild Conference and Expo
 - International Energy Program Evaluation Conference (IEPEC)
 - International Window Covering Expo (IWCE)
 - Association of Energy Service Professionals (AESP) National Conference
 - Affordable Comfort, Inc. (ACI) National Home Performance Conference & Trade Show

Next Steps and Future Plans

- **Technical**
 - Technical and rating procedures for Phase 1 products
 - Develop Annual Energy Performance rating
- **Marketing**
 - Residential product label
 - Brand guidelines
 - Marketing and commercialization materials for residential products
 - Drive awareness of AERC and window attachments
 - Implement utility engagement strategy
- **Certification**
 - Certification program developed
 - Certified Products Database and Website “Go Live” for Phase 1 products

REFERENCE SLIDES

Project Budget

Variances: The planned budget has been adjusted so that a greater amount of federally funded work can be completed toward the middle of the project period rather than at the beginning. It has also been adjusted to accommodate the planned delay in the rollout of Phase 1 products.

Cost to Date: 23%

Additional Funding: Membership Dues, Labeling Fees, Certification Fees

Budget History

10/01/2014– FY 2015 (past)		FY 2016 (current)		FY 2017 – 09/30/2018 (planned)	
DOE	Cost-share	DOE	Cost-share	DOE	Cost-share
\$300,797	\$294,479	\$516,734	\$366,320	\$782,468	\$974,201

Project Plan and Schedule: Overview



Key Changes in Milestone Schedule:

- Phase 2 and 3 rollouts have been pushed back to allow LBNL to focus on developing energy performance rating procedures.
 - AERC believes that AEP will provide consumers with the most valuable information and the most useful basis for comparison.
- Labeled products available at a minimum of one retailer was pushed back.
 - Discussions with manufacturers led to realization that it would take time for labeled product to appear on store shelves with set-up of manufacturing and distribution chains.
- Commercial deadlines pushed back to focus on residential products first.



Project Plan and Schedule: Task 1

Project Schedule																			
Project Start: 10/1/2014				Completed Work															
Projected End: 9/30/2018				Active/Planned Task (in progress work)															
				◆ Milestone (Originally Planned)															
				◆ Milestone (Actual/Updated Planned)															
				FY 2015				FY 2016				FY 2017				FY 2018			
Task 1: Establishment of the AERC Under WCMA				Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)
Past Work																			
Q1: AERC staffing plan implemented and positions filled				[Green bar from Q1 FY2015 to Q1 FY2015]															
Q1: AERC elections held and Council formed				[Green bar from Q1 FY2015 to Q2 FY2015]															
Q3: (GNG) AERC established, committees formed				[Green bar from Q3 FY2015 to Q3 FY2015]															
Q4: Strategy developed for managing objections to prioritization				[Green bar from Q4 FY2015 to Q4 FY2015]															
Q4: Sub-contractors selected				[Green bar from Q4 FY2015 to Q1 FY2016]															
Q4: Final prioritized product list approved				[Green bar from Q4 FY2015 to Q2 FY2016]															
Current/Future Work																			
Q7: Technical and rating procedures approved				[Blue bar from Q1 FY2016 to Q2 FY2016]															
Q8: Procedures released to simulators and test labs				[Blue bar from Q1 FY2016 to Q3 FY2016]															

Project Plan and Schedule: Task 2

Project Schedule																			
Project Start: 10/1/2014				Completed Work															
Projected End: 9/30/2018				Active/Planned Task (in progress work)															
				 Milestone (Originally Planned)															
				 Milestone (Actual/Updated Planned)															
				FY 2015				FY 2016				FY 2017				FY 2018			
Task 2: Ceritfed Products Website (CPW) and Database (CPD) Development				Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)
Current/Future Work																			
Q5: Plan developed to include baseline windows																			
Q6: Approval of website and database structure by BOD																			
Q8: (GNG) CPW and CPD "Go Live" for Phase 1 products																			
Q16: CPW and CPD "Go Live" for Phase 2 products																			

Project Plan and Schedule: Task 3

Project Schedule																			
Project Start: 10/1/2014				Completed Work															
Projected End: 9/30/2018				Active/Planned Task (in progress work)															
				 Milestone (Originally Planned)															
				 Milestone (Actual/Updated Planned)															
				FY 2015				FY 2016				FY 2017				FY 2018			
Task 3: Residential Marketing and Commercialization				Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)
Current/Future Work																			
Q9: Residential product label approved by AERC																			
Q9: Completed residential M&C materials																			
Q11: (GNG) Rated products available at a minimum of 1 major																			

Project Plan and Schedule: Task 4

Project Schedule																			
Project Start: 10/1/2014				Completed Work															
Projected End: 9/30/2018				Active/Planned Task (in progress work)															
				Milestone (Originally Planned)															
				Milestone (Actual/Updated Planned)															
				FY 2015				FY 2016				FY 2017				FY 2018			
Task 4: Commercial Marketing and Commercialization				Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)
Current/Future Work																			
Q16: Commercial product label approved by AERC																			
Q16: Completed commercial M&C materials																			

Project Plan and Schedule: Task 5

Project Schedule																			
Project Start: 10/1/2014				Completed Work															
Projected End: 9/30/2018				Active/Planned Task (in progress work)															
				◆ Milestone (Originally Planned)															
				◆ Milestone (Actual/Updated Planned)															
				FY 2015				FY 2016				FY 2017				FY 2018			
Task 5: Product Phase 1 Technical Development and Rollout				Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)
Current/Future Work																			
Q7: Phase 1 LBNL test methods, simulation procedures, and software tools for Phase 1 accepted by AERC																			
Q8: Minimum of 1 simulation lab and test lab approved																			
Q8: Phase 1 rollout																			
Q11: Revenue stream 20% towards self-sufficiency																			

Project Plan and Schedule: Task 6

Project Schedule																			
Project Start: 10/1/2014				Completed Work															
Projected End: 9/30/2018				Active/Planned Task (in progress work)															
				◆ Milestone (Originally Planned)															
				◆ Milestone (Actual/Updated Planned)															
				FY 2015				FY 2016				FY 2017				FY 2018			
Task 6: Product Phase 2 Technical Development and Rollout				Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)
Current/Future Work																			
Q13: Revenue Stream 40% towards self-sufficiency				Active/Planned Task (in progress work)															
Q14: Phase 2 LBNL procedures and models accepted by AERC				Active/Planned Task (in progress work)															
Q16: Phase 2 rollout				Active/Planned Task (in progress work)															

Project Plan and Schedule: Task 7

Project Schedule																			
Project Start: 10/1/2014				Completed Work															
Projected End: 9/30/2018				Active/Planned Task (in progress work)															
				Milestone (Originally Planned)															
				Milestone (Actual/Updated Planned)															
				FY 2015				FY 2016				FY 2017				FY 2018			
Task 7: Product Phase 3 Technical Development and Rollout				Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)	Q1 (Oct-Dec)	Q2 (Jan-Mar)	Q3 (Apr-Jun)	Q4 (Jul-Sep)
Current/Future Work																			
Q14: Rated products available at a minimum of 3 retailers				Active/Planned Task (in progress work)															
Q16: Phase 3 LBNL procedures and models accepted by AERC				Active/Planned Task (in progress work)															
Q16: Phase 3 rollout				Active/Planned Task (in progress work)															