

Committee Updates

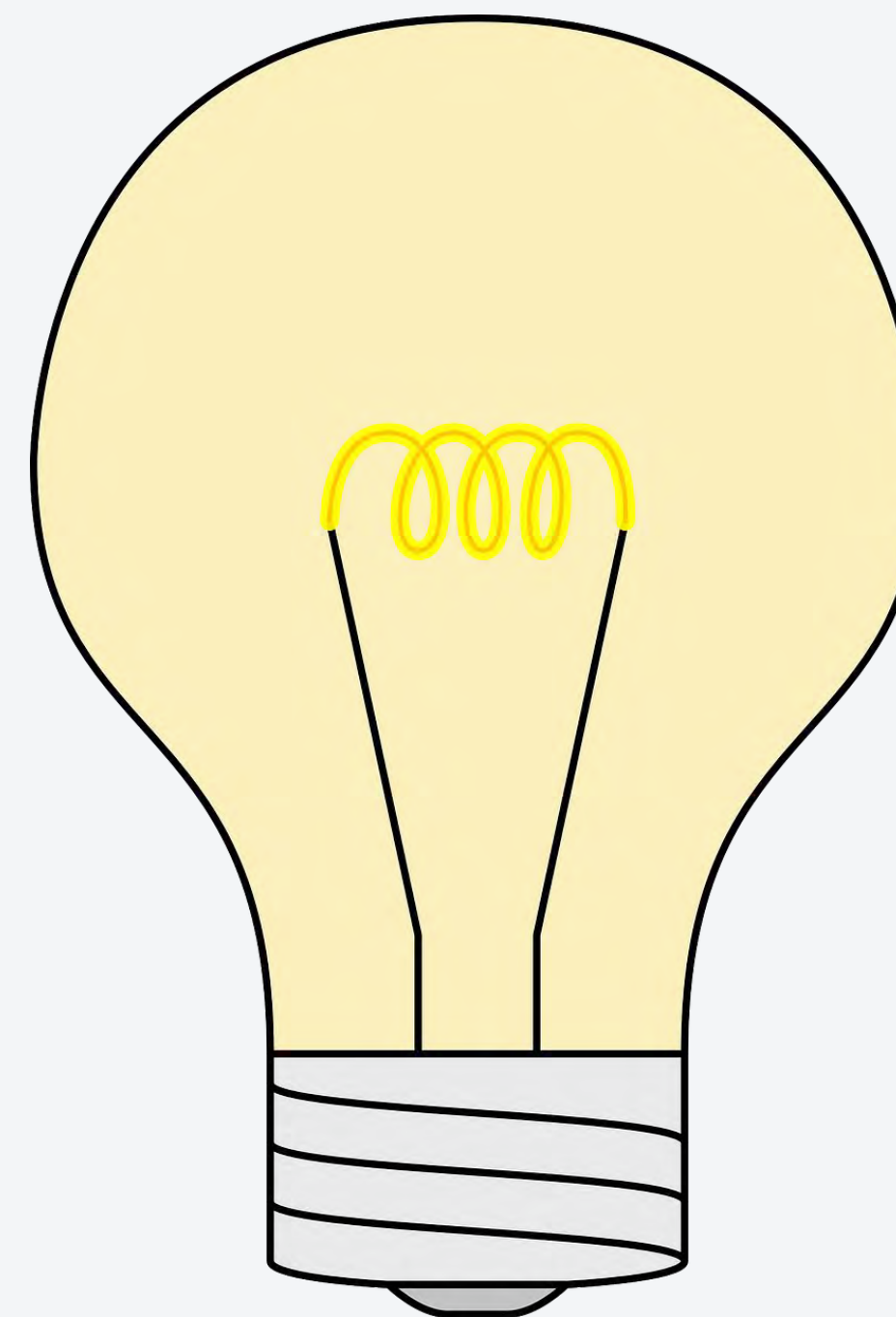
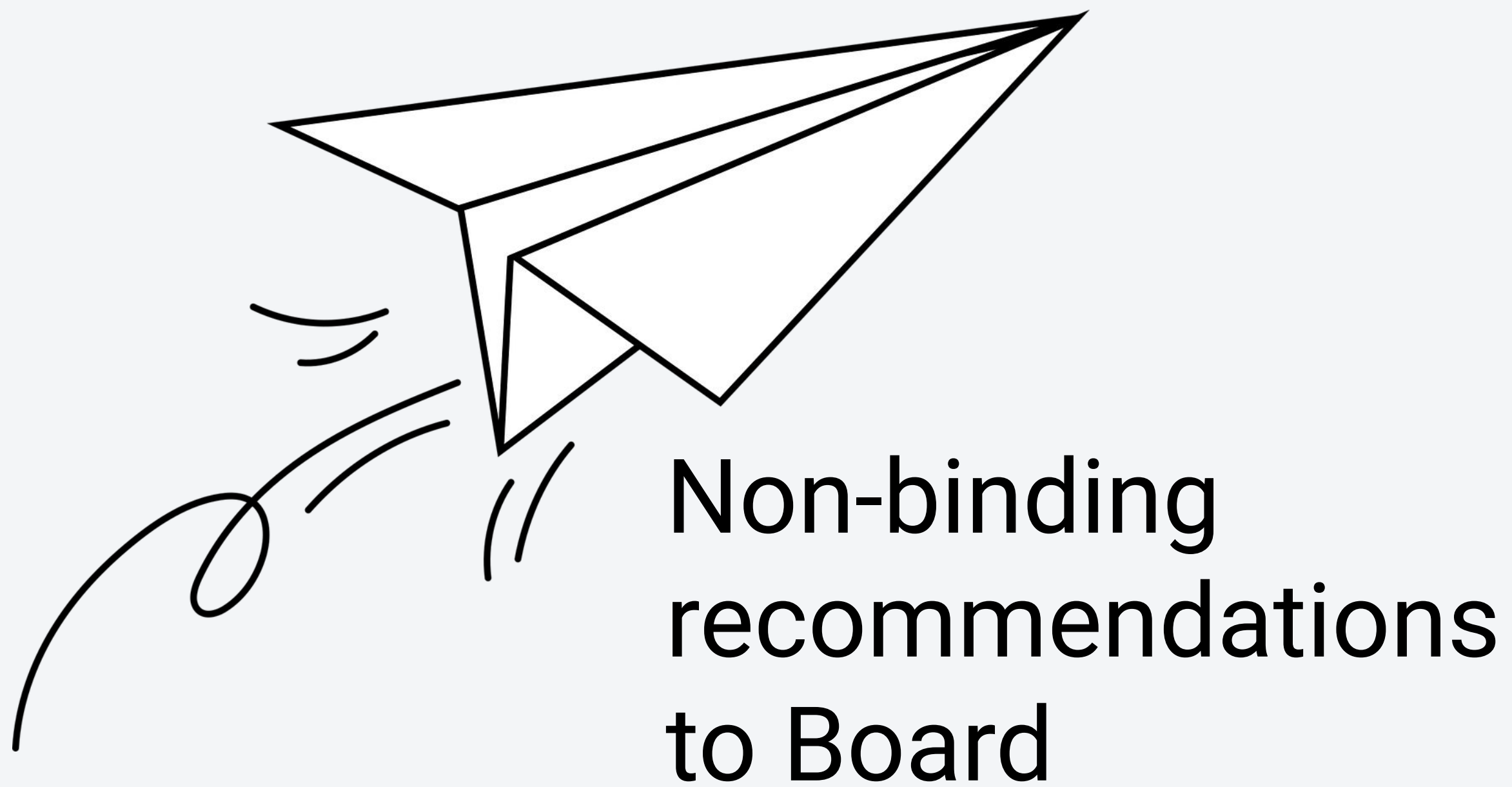


A top-down view of a desk with a spiral notebook, a pen, a wooden pencil, and a monstera leaf. The notebook is open to a blank page with the title and author information. The pen is blue and the pencil is wooden. The monstera leaf is green and has large holes.

Technical Committee Update

George Daisey
Committee Chair

The Technical Committee resolves core scientific and technical issues for the Roof Product Rating Program



Oversees technical research

Committee Makeup

- 32 members
 - 16 voting and 16 alternate
 - Balance of Industry and General Interest
 - Balance of product types within Industry category



Changes to Roster

Thank you to departing members!

- Brent Barbeau, PRI (*Voting*)
- Dan Rardon, Specialty Granules, Inc. (*Voting*)
- Rich Slomko, Atlas Material Testing Solutions (*Alternate*)

Welcome new members!

- Sid Dinwiddie, ARMA (*Voting*)
- Heather Estes, GAF (*Alternate*)
- Bill Hendricks, FSR Treatment Inc. (*Alternate*)
- Walter McIntosh, Holcim (*Alternate*)
- Mike Sand, General Coatings Manufacturing Corporation (*Alternate*)



Key Activities Since 2023 Annual Meeting

Recommended various program changes
See Roof Program Updates slides

Heavy focus on technical research efforts
See Technical Research Update slides

Reviewed results of 2023 Interlaboratory
Comparison Study

Guidance on PVB single-ply membrane
product type

Methods & Instruments Subcommittee Sunset

Thank you, subcommittee members!

Hashem Akbari	Concordia University
Paul Berdahl	Interested Individual
David Cocuzzi, <i>Chair</i>	National Coil Coating Association
Andre Desjarlais	Oak Ridge National Laboratory
Steven Heinje	GAF
Ronnen Levinson	Lawrence Berkeley National Laboratory

- Created in 2014
- Evaluates new & modified test methods & devices
- Inactivated in 2024
 - Reductions in subcommittee membership
 - Maturation of Roof Program



Technical Committee

Staff Contact

Audrey McGarrell

audrey@coolroofs.org





Technical Research Update

Stacey Weister

CRRC Technical Manager

Completed Technical Research Projects

Compilation of Historical Weathering Data

SOC ET100 Emisometer Interlaboratory Study

Retrofitting Buildings with Solar-Reflective Roofs and Walls and its Impact on Peak Power Demand



Compilation of Historical Weathering Data

- **Purpose:** Validate or improve upon current CRRC policy for three-year natural exposure of roof products seeking a rating
- **Description:**
 - Analysis of changes to SR and TE values of 27 roofing products over the course of three-year weathering in Arizona, Florida, and Ohio at 5°S and 45°S tilts
 - Determination of whether SR and TE stabilize within three years of exposure and whether rainfall, air quality, and tilt affect changes in SR and TE

Compilation of Historical Weathering Data

- **Status:**
- Final report approved by Technical Committee in August 2023
- Board authorized project team to write journal article on September 21, 2023
- LBNL staff to write journal article fall 2024



Image Credit: Atlas Weathering

ET100 Interlaboratory Study

- **Purpose:** Evaluation of the Surface Optics Corporation (SOC) ET100 Emittance Meter for potential use in the CRRC Product Rating Programs
- **Description:** Nine sets of roof and wall product specimens were circulated to nine labs to perform comparative thermal emittance testing using existing approved methods and the ET100 method.

ET100 Interlaboratory Study

- **Status:** Testing was completed by nine labs and CRRC staff. CRRC staff are working with SOC to further investigate the device's applicability for certain product types, confirm the accuracy of repeatability and reproducibility stats. Once complete, the findings will be presented to the Technical Committee. The findings may result in another round of round robin testing.



Impact of Cool Roofs and Walls on Peak Power Demand Study

- **Purpose:** Quantify the energy and economic benefits associated with the deployment of cool roof and exterior wall assemblies as a function of building location, thermal properties of existing roof and wall assemblies, and the cost of energy and ratchet charges.
- **Description:** Partnership with Oak Ridge National Laboratory (ORNL) to perform simulations of the effects of cool surfaces on peak power demand in residential and commercial buildings with set climate and insulation variables.

Impact of Cool Roofs and Walls on Peak Power Demand Study

- **Status:** The project was completed at the end of 2023. The final report was presented to the Technical Committee at its May 16, 2024 meeting. There is an opportunity for an additional phase. The final report is accessible at <https://www.osti.gov/biblio/2324016>



Active Technical Research Projects

“ We can change the world and make it a better place. It’s in our hands to make a difference” - Nelson Mandela

- Evaluating Variegated Test Methods Study - Phase 2
- Un-air-conditioned Buildings Literature Review
- Comparison of Rapid Ratings and Naturally Aged Values



Evaluating Variegated Test Methods Study - Phase 2

- **Purpose:** Determine if the CRRC's testing requirements for variegated roofing products can be improved. Continuation of the Evaluating Variegated Test Methods (EVTM) study that was conducted in 2021.
- **Description:** Analysis of a large number of measurement simulations including alternative test methods on twenty-one unique products to see if the testing methods can be streamlined.

Evaluating Variegated Test Methods Study - Phase 2

- **Status:** CRRC staff conducted outreach to CRRC Accredited Independent Testing Laboratories (AITL) to obtain their feedback on current variegated test methods and on potential revised methods based on the findings of the initial analysis. AITLs will simulate the alternative test methods.



Impacts of Cool Surfaces on Un-air-conditioned Buildings Literature Review

- **Purpose:** The intended outcome is to identify specific building types that would benefit from additional study on this topic.
- **Description:** Analyze current literature surrounding the impact of cool roofs and cool exterior walls on human comfort and safety in occupied, un-air-conditioned spaces.

Impacts of Cool Surfaces on Un-air-conditioned Buildings Literature Review

- **Status:** Independent research contractor submitted a draft report to the CRRC in spring 2024. CRRC staff have been working with the researcher to revise the draft report in response to CRRC review. The completed draft will be presented to the Technical Committee at a future meeting.

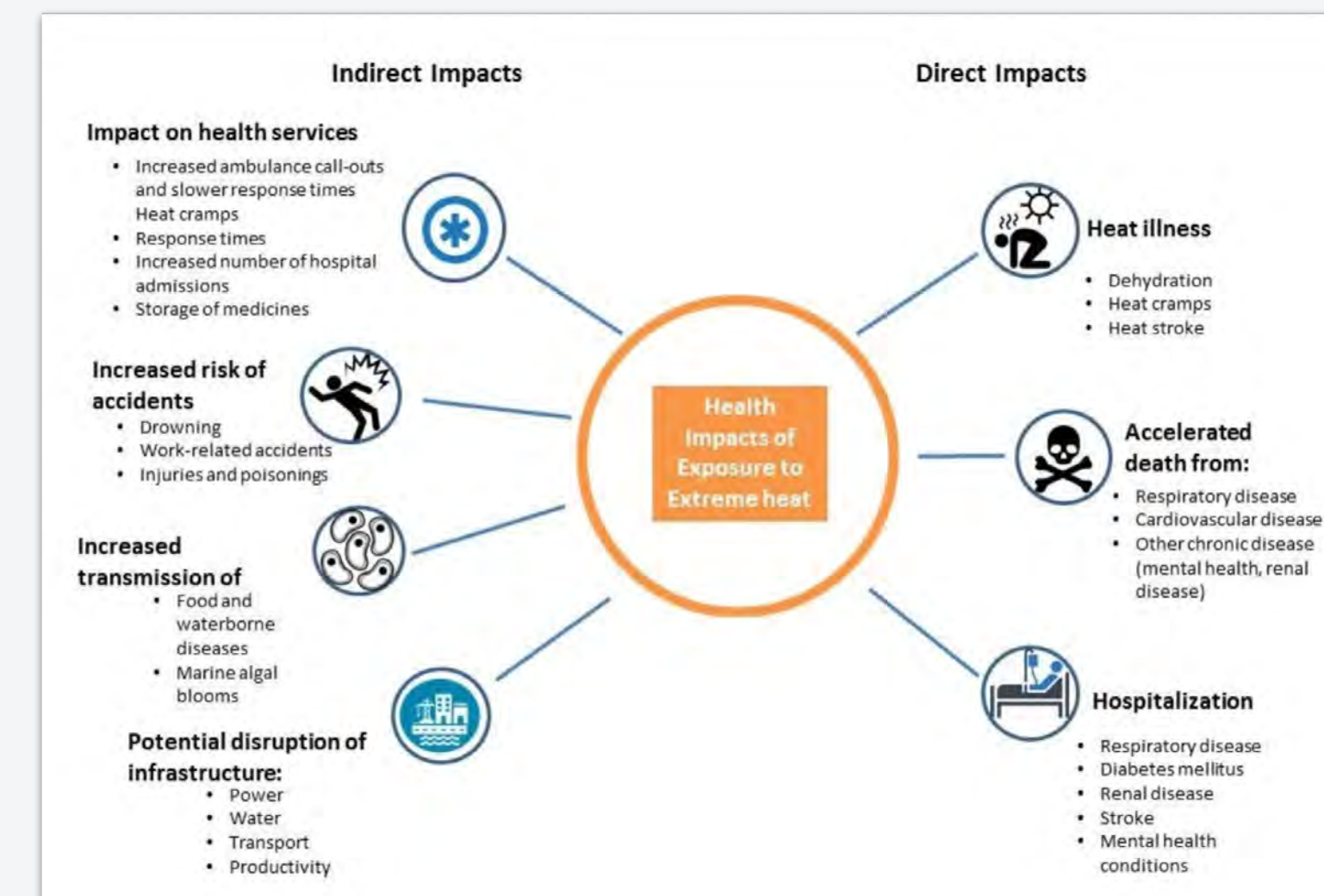


Image Source: World Health Organization

Comparison of Rapid Ratings and Naturally Aged Values

- **Purpose:** Verify the accuracy of the CRRC Rapid Ratings procedure to determine if further research is needed regarding the the Rapid Ratings procedure for specific product types.
- **Description:** Analysis of different factors, (e.g. product type, amount of soil deposited on specimen, etc.) of roofing products that have CRRC Rapid Ratings ratings and completed natural weathering exposure.

Comparison of Rapid Ratings and Naturally Aged Values

- **Status:** As of April 4, 2024 there are 150 products that have Rapid Ratings and three-year aged ratings, but several product types don't yet have enough data to perform a meaningful analysis. CRRC staff will continue to monitor three-year aged data as it becomes available.





Upcoming Project

Impact of Cool Roofs and Walls on Peak Power Demand Study - Phase 2

Phase 2 Proposal Process

- Opportunity for DOE funding collaborating with ORNL
- Up to \$200K funding with 10% in-kind CRRC contribution
- CRRC Board to approve study abstract prior to submission in accordance with CRRC Publication Policy and Procedure
- CRRC staff to develop proposal for DOE funding with assistance from ORNL
- Formal proposal will be submitted at the end of October



ASTM Standard Development Activities

- **New Standard:** Supporting SOC in their development of an ASTM Standard Test Method for their Directional-Hemispherical Solar Reflectance test method (*CRRC-1 Appendix 8 / CRRC-2 Appendix 3*)

- **New Standard:** Developing a new ASTM Standard Test Method for measuring solar reflectance and thermal emittance of aggregate roofing materials less than or equal to $\frac{5}{8}$ " nominal size (*CRRC-1 Appendix 7*)

ASTM Standard Development Activities

- **ASTM E1980 (*Standard Practice for Calculating Solar Reflectance Index of Horizontal and Low-Sloped Opaque Surfaces*)**: Initiated revision to change the Stefan-Boltzmann constant to the full length of the constant as defined by NIST.

- **ASTM C1371 (*Determination of Emittance of Materials Near Room Temperature Using Portable Emisometers*)**: Supporting efforts to include the Slide Method as a non-mandatory Appendix in ASTM C1371.
(*CRRC-1 Appendix 1 / Devices & Services TN11-2*)

Technical Research Staff Contact

Stacey Weister

stacey@coolroofs.org



Ratings, Codes & Standards Committee Update

Sarah Schneider
CRRC Deputy Director

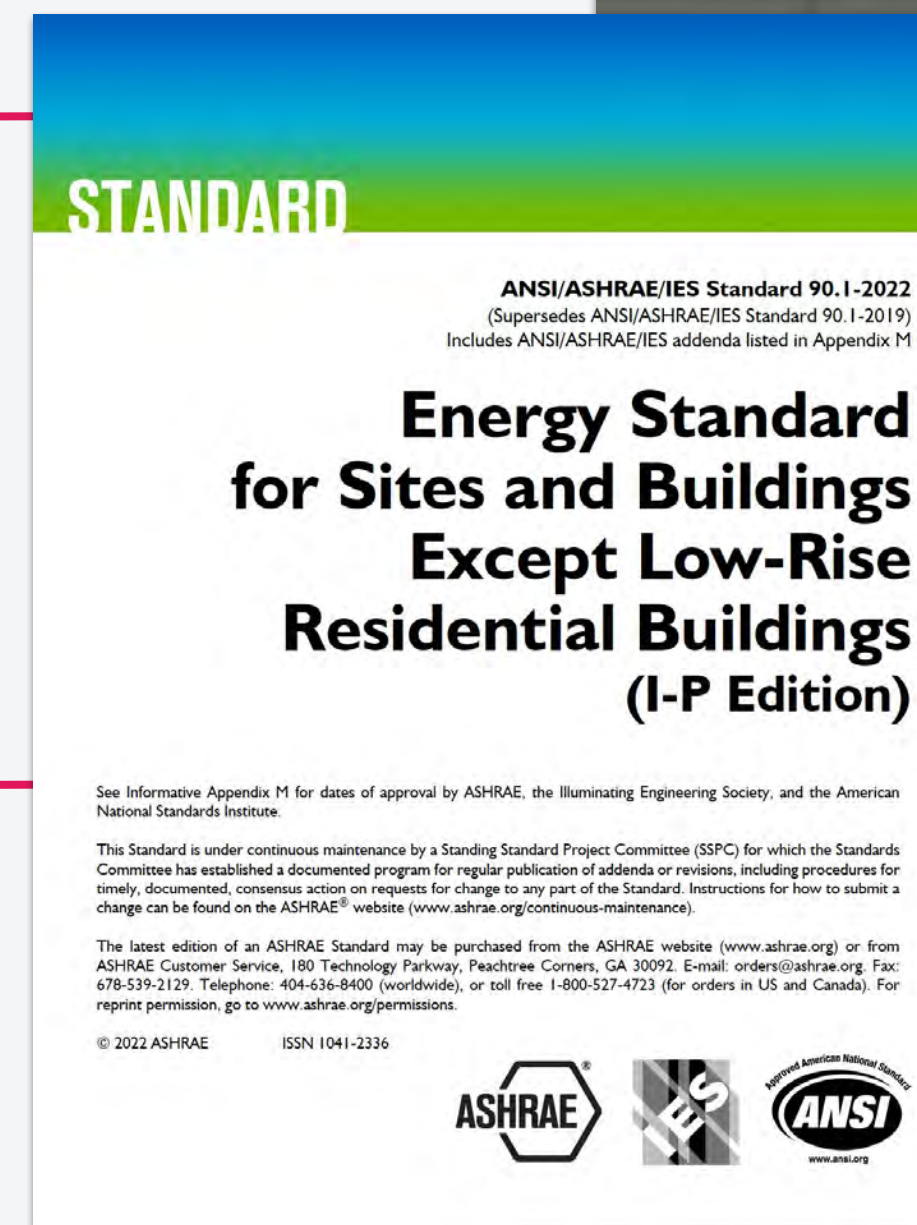
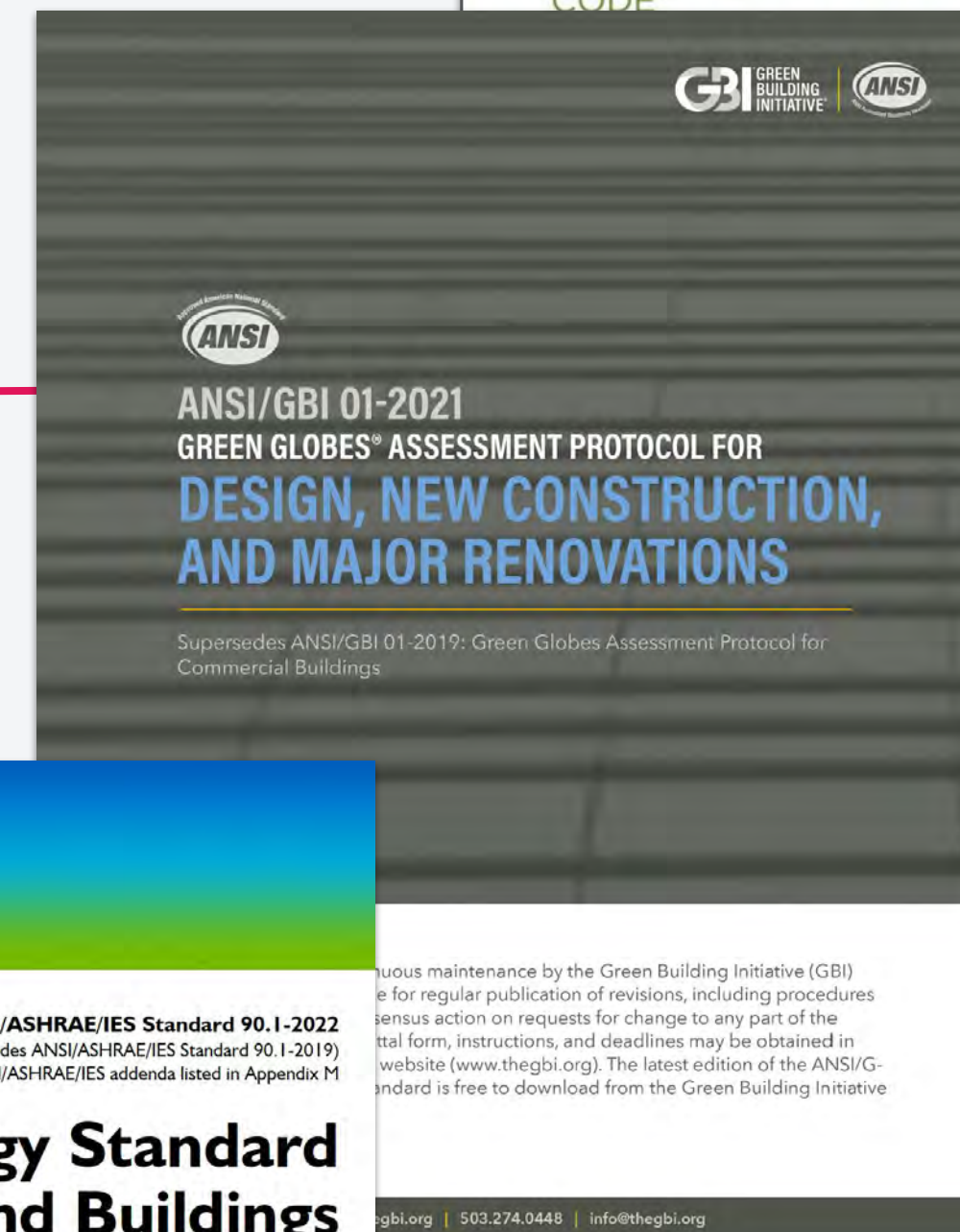
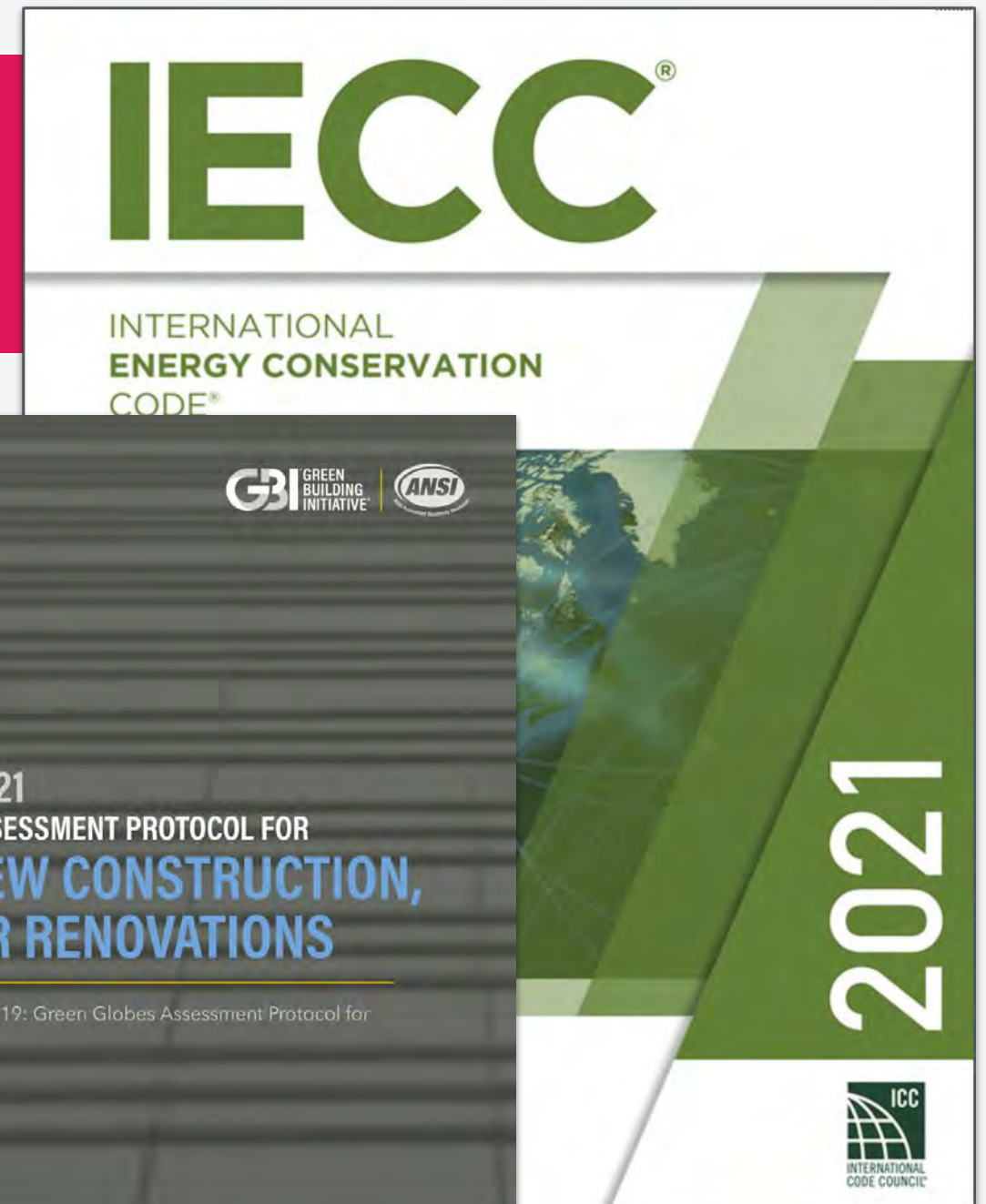


RCS Committee Overview

Advocates for adoption of references to CRRC rating programs and standards

Develops proposals and public comments

Does not develop CRRC standards, make specific recommendations, or lobby



Continuous maintenance by the Green Building Initiative (GBI) for regular publication of revisions, including procedures for consensus action on requests for change to any part of the final form, instructions, and deadlines may be obtained in website (www.thegbi.org). The latest edition of the ANSI/G-Standard is free to download from the Green Building Initiative

gbi.org | 503.274.0448 | info@thegbi.org



COMMITTEE ROSTER

Kurt Shickman, <i>Interim Chair</i>	Interested Individual	General Interest
Heather Estes	GAF	Industry
Nav Koonar	Cedar Shake & Shingle Bureau	Industry
Wade Shepherd	Westlake Royal Roofing	Industry
Amanda Turner	Cornerstone Building Brands	Industry
Howard Wiig	Hawaii State Energy Office	General Interest

Join the committee!

- General Interest members
- Knowledge of local or state initiatives
- Familiarity with energy and green building C&S

Email sarah@coolroofs.org



Adopted CRRC S100 References

Model Energy Codes & Standards

ASHRAE Standard 90.1*

International Energy Conservation Code (IECC) *

RESNET (ANSI/RESNET/ICC 301 - 2022) *

Green Building Rating Systems

LEED

Green Globes

Green Building Codes & Standards

International Green Construction Code (IgCC)

CALGreen

Jurisdictions

Florida Building Code

Georgia Construction Code

Hawaii Energy Building Code

Requires CRRC Rated Products

Municipalities

Chicago Energy Transformation Code
City and County of Los Angeles
Denver Green Building Ordinance
District of Columbia Construction Codes
Miami Zoning Ordinance

Rebate Programs

LADWP Cool Roof Rebate
Louisville Cool Roof Rebate Program
Salt River Project Cool Roof Rebate
San Antonio Cool Roof Rebate
Toronto Eco-Roof Program

States

California Energy Code

Monitoring Active CRRC Proposals

Code, Standard or Program	CRRC Proposals	Submission Date	Status
IECC (2024)	<ul style="list-style-type: none"> Update S100 reference 	Jun. 2021	<i>Accepted comment</i>
BSR/ASHRAE 227P	<ul style="list-style-type: none"> Reference CRRC-1 and CRRC-2 Replace SRI with SR and TE for walls 	Oct. 23, 2023	<i>Monitoring</i>
ICC 700 (2024)	<ul style="list-style-type: none"> Replace ENERGY STAR with CRRC-1 Program (roofs) Reference CRRC-2 (walls) and add “minimum initial” to existing language 	Feb. 2022	<i>Accepted comments with modifications</i> <i>Monitoring</i>



Monitoring Active CRRC Proposals

Code, Standard or Program	CRRC Proposals	Submission Date	Status
ANSI/GBI-01	<ul style="list-style-type: none"> Reference CRRC-1, S100 & CRRC-2 Replace SRI with SR and TE for walls 	Jan. 31, 2024	<p><i>Accepted with modifications</i></p> <p><i>Monitoring</i></p>
ANSI/GBI-02	<ul style="list-style-type: none"> Reference ANSI/GBI-01 (indirect reference to CRRC) 	Jan. 31, 2024	<p><i>Monitoring</i></p>
LEED v5 Heat Island Credits	<ul style="list-style-type: none"> Reference S100 	May 6, 2024	<p><i>Monitoring</i></p>





RESOURCES

Looking for Cool Roof or Cool Exterior Wall Codes, Standards, and Voluntary Programs?

While we strive to keep our information current, this is not an all-inclusive list. Please contact the individual agency for updated program information.

Codes and Standards by U.S. Jurisdiction

Cool Roof Model Codes & Standards

Cool Exterior Wall Model Codes & Standards

Cool Roof Voluntary Programs

Cool Exterior Wall Voluntary Programs

Codes and Standards by U.S. Jurisdiction

Last Updated: January 5, 2024

Alabama

Alabama State Building Code >

Arizona

Phoenix Building Construction Code >

City of Scottsdale Green Building Code >

California

California Building Energy Efficiency Standards (Title 24, Part 6) >



RCS Committee Staff Contact

Sarah Schneider

sarah@coolroofs.org



The background of the slide features a clear blue sky with several palm trees. One palm tree trunk is prominent on the left side, extending from the bottom towards the top. Another palm tree is visible in the center, and a third, more blurred one is on the right. A portion of a light-colored building is visible on the right side of the frame.

Wall Rating Program Committee Update

Dale McIntyre
Committee Chair

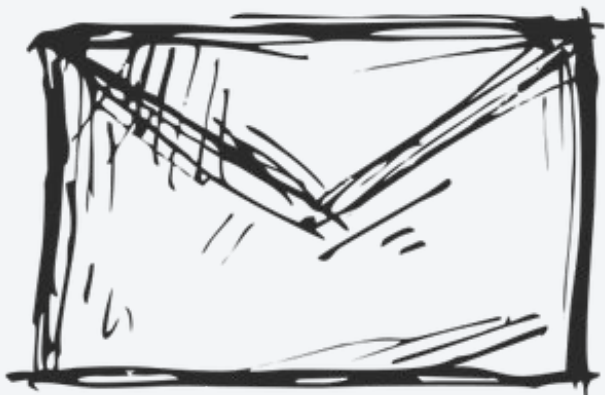
Wall Rating Program Committee



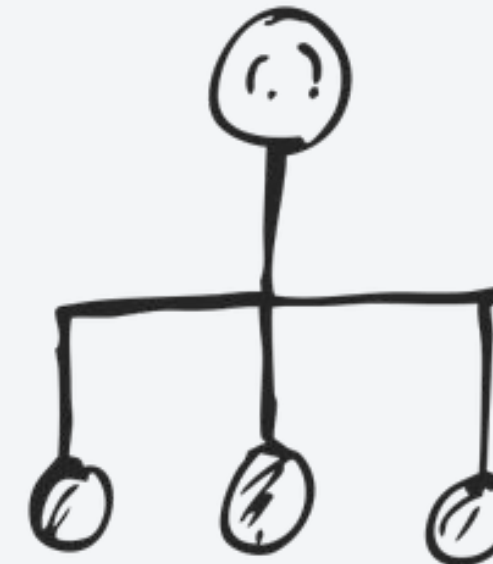
Evaluate technical issues



Develop program procedures & requirements



Guidance on program marketing



Collaborate with other committees

Committee Makeup

- 25 Members (max 30)
 - 15 voting and 10 alternate
 - Balance of Industry and General Interest



Committee Roster

VOTING	AFFILIATION	ALTERNATE	AFFILIATION
Dale McIntyre, Chair	Behr Paint Company	Ginger Shi	Behr Paint Company
Alex Nicol	Sherwin-Williams	David Cocuzzi	National Coil Coating Association
Howard Wiig	Hawaii State Energy Office	Vacant	
Ronnen Levinson	Lawrence Berkeley National Laboratory	Vacant	
Steve Drennan	International Institute of Building Enclosure Consultants	Neal Johnson	International Institute of Building Enclosure Consultants
Tim Hebrink	3M	Evan Montanez	Cool Additives Technology (Coadtech)
Suzanne Chang	American Coatings Association	Katherine Berry	American Coatings Association
Brandon Bethke	Tempo Chemicals & Solutions	Jim Dunn	Vibrantz Technologies
Robert Bennett, Vice Chair	Tex-Cote	Eric Brown	Tex-Cote
Paige Kuplic	Axalta	Farhan Ansari	Dow Construction Chemicals
Wally Kesler	Dunn-Edwards	Chris Wessels	Dunn-Edwards
Bill Dean	Interested Individual	Vacant	
Rankin Jays	Polyglass	Vacant	
Jonathan Parfrey	Climate Resolve	Neetu Jain	Global Cool Green Cities Foundation
Ashley Timms	ACE Laboratories	Vacant	

Seeking General Interest Alternate Members!



Committee Liaison Update

- **Committee liaison:**
Audrey McGarrell
- **Program Manager and Committee Support:**
Beth James-Bourgeois



Key Activities Since 2023 Annual Meeting

Recommended various program changes
See Wall Program Updates slides

Considered collaboration with Master
Painters Institute

Evaluated adhesion of factory-coated fiber
cement as a paint substrate

Key Activities Since 2023 Annual Meeting

Developed educational document about potential energy cost savings with cool exterior walls



**Estimated
publication
July 2024**

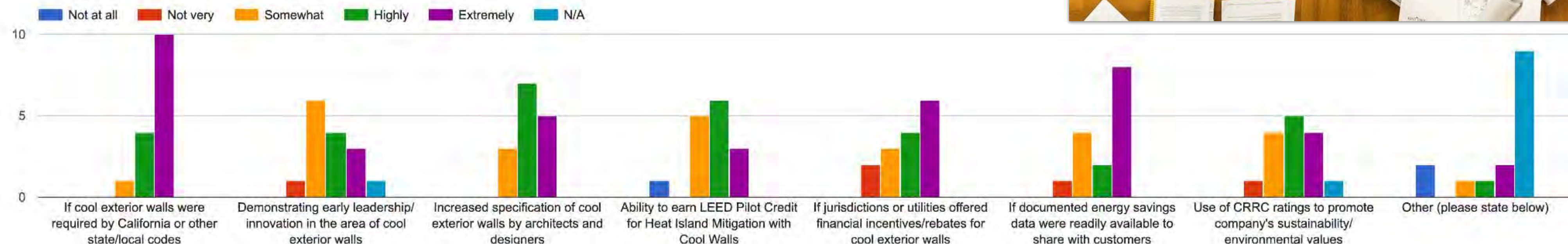


Key Activities Since 2023 Annual Meeting

Conducted program participation survey and formed Marketing Working Group

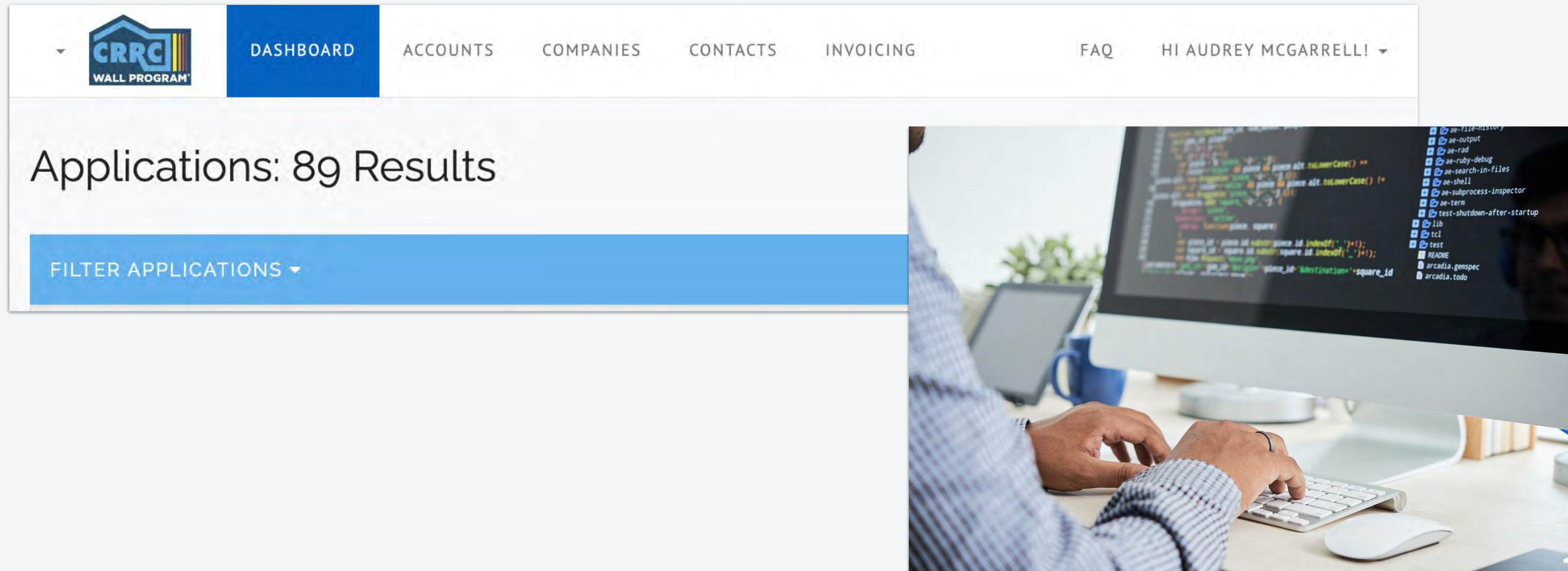


If you were to consider obtaining CRRC Wall Product Ratings, please rank how important each of the below factors would be to your decision.



Key Activities Since 2023 Annual Meeting

Recommended integration of Wall Program into CRRC Online Rating Portal



The screenshot displays the CRRC Wall Program dashboard. At the top left is the CRRC Wall Program logo. The navigation menu includes: DASHBOARD (highlighted), ACCOUNTS, COMPANIES, CONTACTS, INVOICING, FAQ, and a user profile for HI AUDREY MCGARRELL!. The main content area shows "Applications: 89 Results" and a "FILTER APPLICATIONS" button. A list of application names is visible on the right side of the dashboard, including:

- ae-file-history
- ae-output
- ae-rad
- ae-ruby-debug
- ae-search-in-files
- ae-shell
- ae-subprocess-inspector
- ae-term
- test-shutdown-after-startup
- lib
- tcl
- test
- RCACHE
- arcadia.genspec
- arcadia.todo

WRPC Committee

Staff Contact

Audrey McGarrell

audrey@coolroofs.org



A tropical beach scene at sunset. The sky is filled with soft, colorful clouds in shades of orange, yellow, and blue. The sun is low on the horizon, casting a warm glow over the ocean. The water is calm with gentle waves lapping at the sandy beach. In the foreground, the silhouettes of palm trees are visible against the bright sky.

Education Committee Update

Frank Klink

Committee Chair

Education Committee Overview

Purpose

Provide guidance on the CRRC's educational activities to improve public awareness and comprehension of cool surfaces

Scope

- Create educational materials
- Identify opportunities
- Collaborate with other CRRC committees

COMMITTEE ROSTER

George Daisey	Dow	Industry
Sid Dinwiddie	ARMA	Industry
Neetu Jain, <i>Vice Chair</i>	Global Cool Green City Foundation	General Interest
Frank Klink, <i>Chair</i>	Interested Individual	General Interest
Maria Koetter	Interested Individual	General Interest
Dale McIntyre	Behr Paint Company	Industry
David Sailor	Interested Individual	General Interest
Wade Shepherd	Westlake Royal Roofing	Industry
Kurt Shickman	Interested Individual	General Interest
Shawn Stanley	IB Roofing Systems	Industry
Amanda Turner	Cornerstone Building Brands	Industry
Steve Wadding	Polyglass USA	Industry
Howard Wiig	Hawaii State Energy Office	General Interest



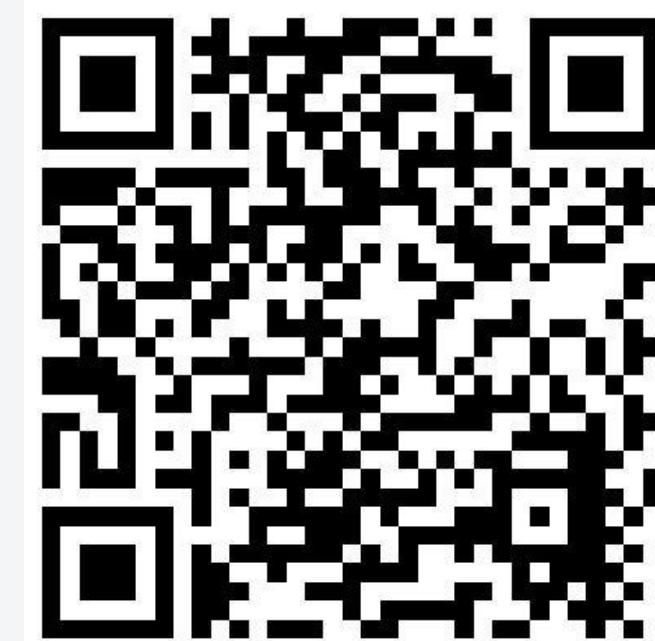
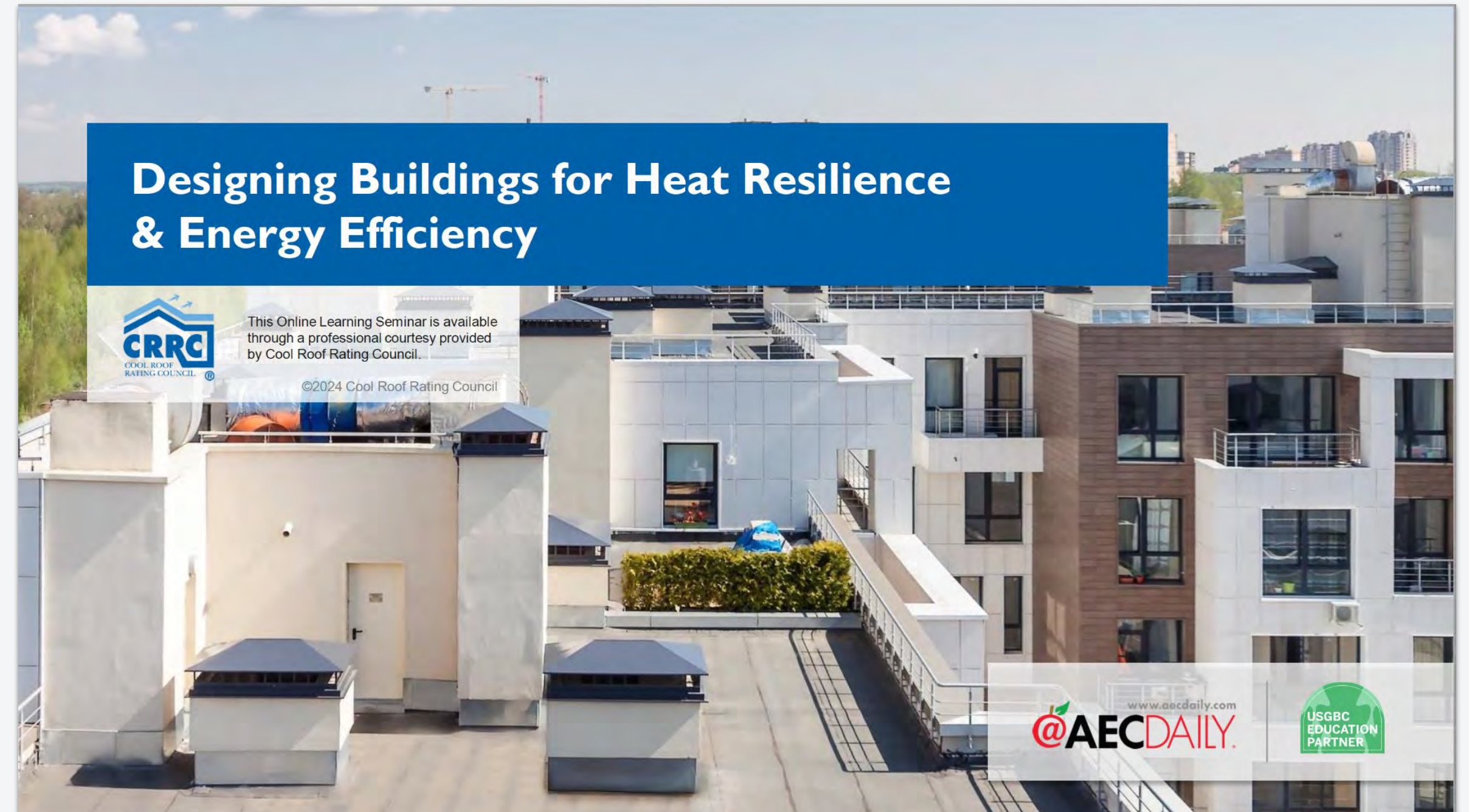
Seeking General Interest Members!

- Two open seats
- Architects, specifiers, builders, contractors, government, utilities, NGOs, researchers / academia & interested individuals
- Email sarah@coolroofs.org



CRRC Continuing Education Course

- Recently revamped
- Now hosted on AEC Daily
- No cost (must create account)
- Registered with 28 U.S. & Canada organizations that provide CE credits, including
 - AIA (American Institute of Architects)
 - GBCI (Green Business Certification)
 - NAHB (National Association of Home Builders)
 - IIBEC (International Institute of Building Closure Consultants)



Current Project: NRF Info Brief

- Describes how cool roofs can counter global warming via negative radiative forcing (NRF)
- Preliminary info resource tied to CRRC Strategic Plan objective
- Will be published on coolroofs.org

COOLING BEYOND THE BUILDING:

THE POTENTIAL FOR REFLECTIVE SURFACES TO COUNTER GLOBAL WARMING

It is well known that reflective surfaces help keep buildings cooler and reduce the costs and greenhouse gas (GHG) emissions from air conditioning, but is your cool roof also contributing to a cooler planet? A growing body of research highlights the ability of cool surfaces to reflect more sunlight, rather than absorb it, which means these surfaces return more of the sunlight back through the atmosphere and out into space, starting from the moment the surfaces are installed.

WHAT IS ATMOSPHERIC COOLING?

The Earth gets energy from the sun in the form of sunlight, also known as solar radiation. Increasing the fraction of solar energy that is reflected from the Earth's surface cools the planet's surface and the atmosphere. We can do so by replacing dark, more solar-absorptive surfaces with lighter, more solar-reflective surfaces, such as cool roofs.

In addition to potentially reducing new GHG emissions via energy efficiency, cool roofs could offset the warming effect of GHGs already in the atmosphere. Scientists have tried to quantify the global cooling effect in terms of offsetting GHG emissions since much of our climate policy and finance is based on GHG mitigation.



HOW MUCH ATMOSPHERIC COOLING IS POSSIBLE FROM COOL ROOFS?

It turns out, quite a lot. Efforts to quantify this effect concluded that the use of more solar-reflective surfaces in cities around the world could cancel the warming effect of 44–57 billion metric tons of emitted carbon dioxide—up to 55% more than the annual global emissions of carbon dioxide in 2022. At a building scale, that means that increasing the reflectivity of 1,000 ft² (93 m²) of roof area could offset the warming effect of 10 tons of CO₂ emissions [1,2]. Atmospheric cooling from the use of a cool roof is a one-time rather than annual benefit.

Akbari, Menon, and Rosenfeld [1] found that even a modest increase in the solar

reflectance of a roof surface can have a positive impact on reducing GHG emissions by (1) lowering the building's cooling demand by reducing its solar heat gain, (2) reducing peak demand, and (3) increasing the community's albedo (solar reflectance).

Complex atmospheric dynamics may prevent highly reflective roofs from realizing the full global cooling potential attributed to them, but the fundamentals remain unchanged—cool roofs absorb less of the sun's energy, decreasing the amount of heat that gets trapped in the atmosphere, and help to cool the world and our homes.



REFERENCES

- [1] H. Akbari, S. Menon, A. Rosenfeld, Global cooling: Increasing world-wide urban albedos to offset CO₂, *Climatic Change* 94 (2009) 275–286. <https://doi.org/10.1007/s10584-008-9515-9>.
- [2] S. Menon, H. Akbari, S. Mahanama, I. Sednev, R. Levinson, Radiative forcing and temperature response to changes in urban albedos and associated CO₂ offsets, *Environmental Research Letters* 5 (2010). <https://doi.org/10.1088/1748-9326/5/1/014005>.

PUBLISHED XXXX 2024

LEARN MORE

WHAT IS A COOL ROOF?

CRRC RATED ROOF PRODUCTS DIRECTORY



For more information and resources about cool roofs, visit coolroofs.org.



Current Project: STEAM Curriculum

STEAM Educational Curriculum for Middle Schoolers



Image Credit: Mohamed Sadek for NPR





Get Involved with the STEAM project

Sponsor

Financial and in-kind donations to schools for experiment materials



Volunteer

In-person or virtual guest presentations and technical review of projects



Learn More

Contact:

audrey@coolroofs.org

or Visit:



<https://coolroofs.org/resources/cool-surfaces-lesson-plan>

STEAM Project Working Group

- Sid Dinwiddie, ARMA
- Frank Klink (*WG Leader*), Interested Individual
- David Sailor, Interested Individual
- Wade Shepherd, Westlake Royal Roofing
- Kurt Shickman, Interested Individual
- Shawn Stanley, IB Roofing Systems
- Amanda Turner, Cornerstone Building Brands
- Steve Wadding, Polyglass USA
- **Audrey McGarrell**
- **Beth James-Bourgeoise**



Education Committee

Staff Contact

Sarah Schneider

sarah@coolroofs.org

