



An ACI Center of Excellence
for Carbon Neutral Concrete

Update on NEU (Spring 2024)

Dean A. Frank, P.E., Executive Director

NEU: An ACI Center of Excellence for Carbon Neutral Concrete

March 27, 2024



THE WORLD'S GATHERING PLACE FOR ADVANCING CONCRETE



Vision

The Center envisions a concrete industry where all stakeholders have access to technologies and the knowledge needed to effectively and safely produce and place carbon-neutral concrete and concrete products in the built environment.

Mission

To drive education, awareness, and adoption of the use of carbon-neutral concrete materials and technologies.

Founding Member



American Concrete Institute
Always advancing

Thank You ACI!

Members of NEU

Sustaining Member



Supporting Members



Affiliate Members



Allied Organizations (MOUs)

Current Allied Organizations

- International Code Council Evaluation Services (ICC-ES)
- Inter-American Cement Federation (FICEM)
- ASTM International
- National Ready Mixed Concrete Association (NRMCA)
- CP Tech Center at ISU
- Slag Cement Association (SCA)
- Portland Cement Association (PCA)
- Carbon Zero Youth Initiative (CZYI)
- California Nevada Cement Association (CNCA)
- American Society of Concrete Contractors (ASCC)**
- American Council for an Energy Efficient Economy (ACEEE)**



Allied Organizations in Discussion

- RILEM
- Fédération internationale du béton (fib)
- Amer. Conc. Pavement Association (ACPA)
- Sherbrooke University
- Global Cement and Concrete Association (GCCA)
- Climate Action Reserve

ACI Center of Excellence on Carbon-Neutral Concrete

NEU Team



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Executive Director



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Director of Validation

Highlights and Recent Accomplishments

October 2023 – March 2024

- Spoke at the **ACI Middle East Conference in Riyadh**, Saudi Arabia
- Participated in **Big 5 Global** in Dubai
- COP 28...more on this later**
- Received **\$250k grant** from Breakthrough Energy
- State-of-the-art Material and Technology Survey**



Highlights and Recent Accomplishments

October 2023 – March 2024

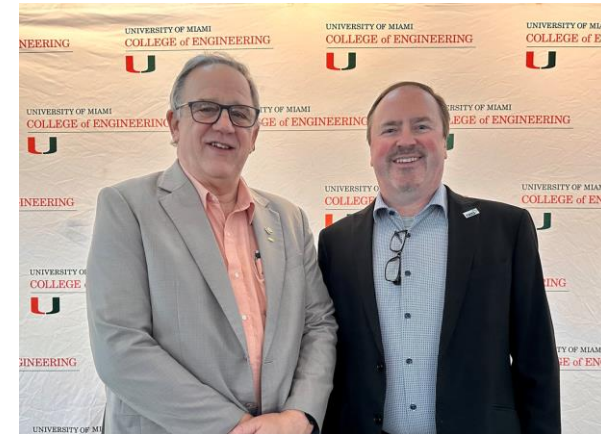
- Submitted an **EPA grant proposal** to support the NEU Validation/Verification program and to attain accreditation
 - This will ultimately enable NEU to conduct third-party verification of Environmental Product Declarations (**EPDs**).
 - Funding of approximately **\$730k** over a three-year period was proposed.
- Completed the **first pilot Verification Statement** for a client.
 - We have a second applicant now that we are working with to conduct the second Verification Statement in our pilot program.
- Completed first draft of the NEU Validation/Verification Program Quality Management System (**QMS**)



Highlights and Recent Accomplishments

October 2023 – March 2024

- Conducted **ACI webinar** on the ABCs of Concrete Sustainability
- **NEU BOD** meeting
- Participated on FIB Task Group 6.2 on Quality Control of Prefabricated Concrete
- Attended the World of Concrete 2024
 - **Press conference** covering the establishment of NEU, the upcoming publication of ACI 323 Low-Carbon Concrete code, and ACI/NEUs' participation at COP28.
- Attended and spoke at the **FICEM/FIHP: Workshop** about netzero roadmaps, codes and standards in cement & concrete LATAM hosted by the University of Miami.
- Attended the **PCI Convention**, committee meetings, and The Precast Show



Highlights and Recent Accomplishments

October 2023 – March 2024

- Attended and spoke at the **Annual Tri-Service Pavement-Transportation Meeting**, which was attended by approximately 120 pavement and airfield design engineers from the Army, Navy and Air Force and hosted at the Denver Federal Center.
- Established a date, location, and theme for the **NEU Spring 2024 Summit**.
 - At University of California – Davis (near Sacramento) on **May 23** and will focus on state initiatives
 - The Fall 2024 summit will once again be focused on federal initiatives.
- Redesigned the Resources page on the **NEU website** (<https://www.neuconcrete.org/resources>) and updated several other pages



Highlights and Recent Accomplishments

October 2023 – March 2024

- Participated on the **ACI Outlook 2040 Task Group** meetings
- Participated in the American Society of Concrete Contractors (**ASCC**) Sustainability Committee meeting
- Coordinated with the National Renewable Energy Laboratory (**NREL**) in Golden, CO to support a **Cement Decarbonization Workshop** that will take place on July 30-31
- Continued participation on the **NIST** Low-Carbon Cement and Concrete Consortium.
 - ACI/NEU hosted an in-person consortium meeting at the Spring Convention in New Orleans.
- Established a **standing article** on NEU in Concrete International magazine, with the first set to be published in the next issue.



ACI/NEU COP28 Participation

What is COP28?

- COP 28 refers to the United Nations Climate Change Conference taking place in Dubai, UAE, from 30 November until 12 December 2023
- Conference of Parties (COP)
- Paris Agreement of 2015
 - Goal is to “to limit the temperature increase to 1.5°C above pre-industrial levels.”



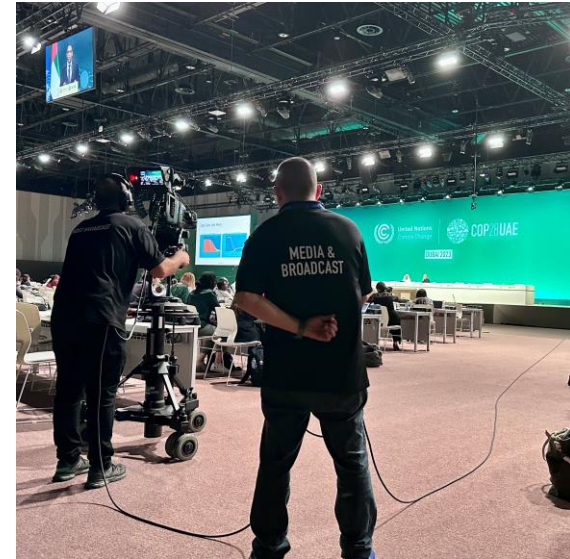
ACI/NEU COP28 Participation

- Overwhelming, but well worth the effort
- Collaborated with GCCA
- Access to Blue Zone
- Promoted ACI 323 and NEU
- In addition to main COP presidency events and negotiations, there are hundreds of concurrent side events



Key Take Aways from COP28

- Global Stocktake:
 - **Parties are off-track** and urgent action is necessary in order to reduce global CO2 emissions needed to reach the goals in the Paris Agreement
- Call on governments to **speed up the transition away from fossil fuels** to renewables such as wind and solar power in their next round of climate commitments.



Key Focus of ACI and NEU

- Because of the urgency necessary to meet the Paris Agreement goals, new and streamlined methodologies are needed to quickly evaluate and identify high-potential materials and technologies and accelerate their acceptance and use in the marketplace.
- This is what ACI and NEU are focused on now



Low-Carbon Concrete Materials State-of-the-Art Company Surveys

(Phase 1)



Project Goals

- Determine what types of low-carbon materials are **available now**.
- Determine what types of low-carbon materials might be **available soon**.
- Gather a **list of current challenges** these companies are facing.


Process (completed)

- Collected master list of low-carbon companies from any source available
 - ~100+ companies


- Culled list to exclude
 - Companies not producing a material
 - Companies outside the United States
 - Companies still in the research-only phase

- Reached out to companies with invitation to participate in Survey A

Survey Part A



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Section 1 of 8

PART A: Questionnaire for Database of Companies Producing Low-Carbon Concrete Materials and Technologies

Thank you for adding your company and material/technology information to our database.

We are hoping you will be able to complete this form in 10-15 minutes. There is no need to write very long responses to any of the questions unless you want to. General ballpark answers will be fine. Please avoid including hyperlinks to your website though, we would rather have the information in your own words. Also, for any multiple choice or checkbox question, feel free to select "Other" and add a comment.

Thank you for your participation. If you have any questions, please e-mail info@neuconcrete.org.

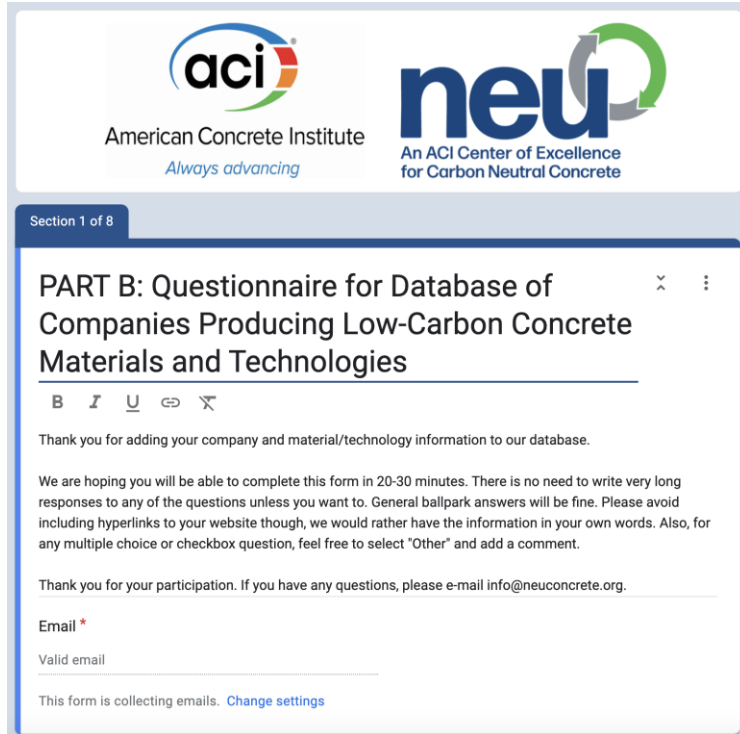
Email *

Valid email

This form is collecting emails. [Change settings](#)

- Producer Information
- Business Development and Support
- Market Availability and Supply Chain Information
- Technology and Production Methodology
- Environmental Claims
- Specifications and Standards
- Cost

Survey Part B



The screenshot shows the top of a survey form. At the top left is the ACI logo (American Concrete Institute) with the tagline 'Always advancing'. To its right is the neu logo (An ACI Center of Excellence for Carbon Neutral Concrete) featuring a circular arrow graphic. Below the logos, a blue bar indicates 'Section 1 of 8'. The main title of the form is 'PART B: Questionnaire for Database of Companies Producing Low-Carbon Concrete Materials and Technologies'. Below the title is a rich text editor with icons for bold, italic, underline, link, and unlink. The form contains the following text:

Thank you for adding your company and material/technology information to our database.

We are hoping you will be able to complete this form in 20-30 minutes. There is no need to write very long responses to any of the questions unless you want to. General ballpark answers will be fine. Please avoid including hyperlinks to your website though, we would rather have the information in your own words. Also, for any multiple choice or checkbox question, feel free to select "Other" and add a comment.

Thank you for your participation. If you have any questions, please e-mail info@neuconcrete.org.

Email *

Valid email

This form is collecting emails. [Change settings](#)

- Producer Information (same as Part A)
- Business Development and Support (additional questions)
- Future Production
- Technology and Production Methodology (additional questions)
- Environmental Claims (additional questions)
- Performance
- Challenges

Process (to be completed)

- Add any additional companies to list
- Re-include international and research-only companies
- Reach out to all companies to:
 - complete Survey Part A if they haven't
 - complete Survey Part B

Results of Survey Part A



Thank you to these participating companies



Producer Information

■ Company Name

■ Contact Name

■ Contact E-mail

■ Contact Phone Number

■ Contact Address (including city/state/country)



Business Development and Support

- Please indicate your level of business development.
 - Research-only
 - Early-stage startup
 - Venture-funded startup
 - Late-stage startup
 - Established business
 - Associated with a larger parent company (cement company, construction company, etc)
 - Other

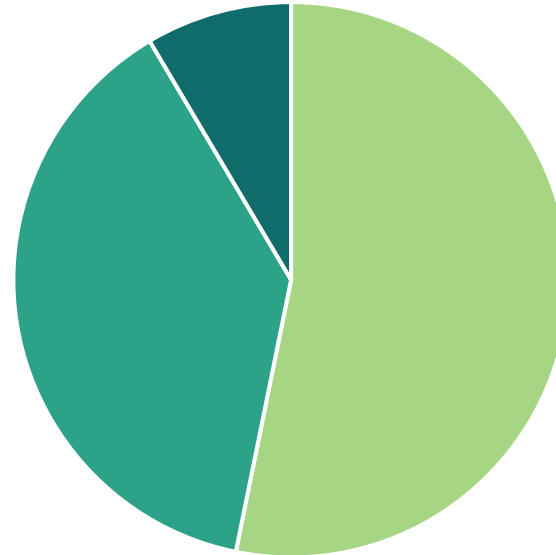
- What year was your company started?

Business Development and Support

- Based on the (slightly altered) NASA Technology Readiness Levels (TRL) below, where is your company?
 - TRL 1: Basic material/technology principles observed
 - TRL 2: Material/technology concept and/or application formulated
 - TRL 3: Analytical and experimental proof of concept
 - TRL 4: Material/technology validated in laboratory environment
 - TRL 5: Material/technology validated in relevant environment
 - TRL 6: Material/technology demonstrated in relevant environment (pilot project)
 - TRL 7: Material/technology demonstrated in operational environment (full-scale project)
 - TRL 8: Material/technology ready for full-scale production
 - TRL 9: Material/technology at full-scale production

Market Availability and Supply Chain Info

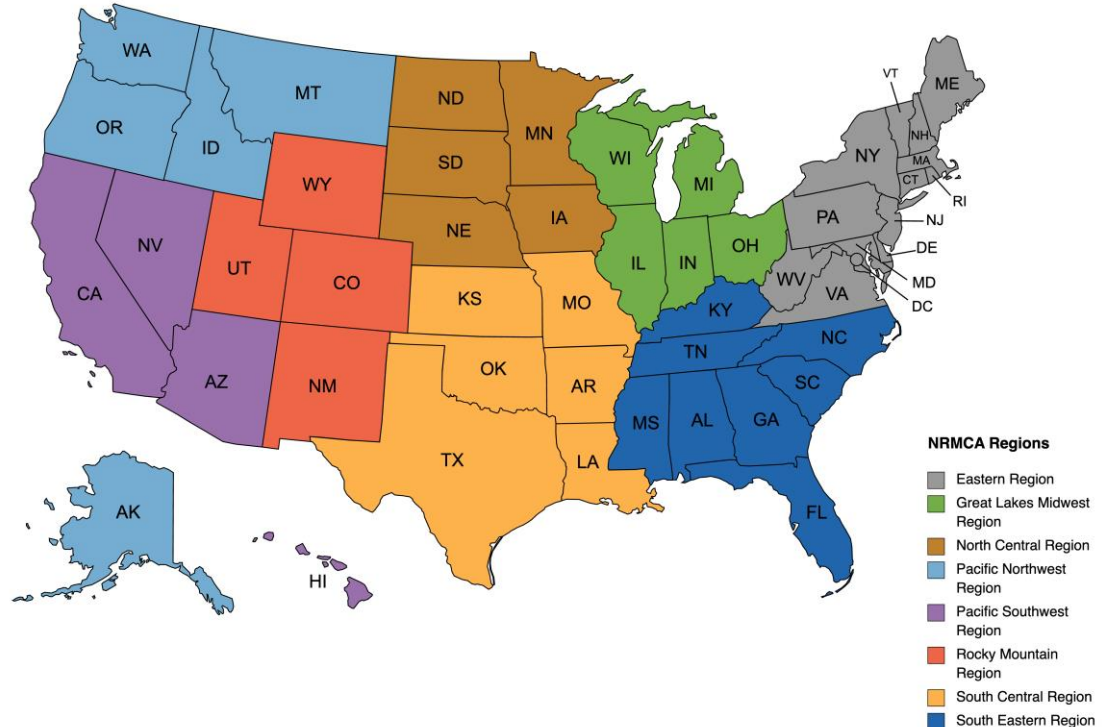
- In terms of full-scale market availability, please choose the timeline below that best reflects when your product will be ready for production and sales at scale.



■ Now ■ 2023-2026 ■ 2027-2030

Market Availability and Supply Chain Info

- If your product is currently available on the market, which regions is it available in?
- In 5 years, in what regions do you anticipate your product being available?



Market Availability and Supply Chain Info

- Please provide the brand name of the primary product you are producing.
- Please list the city/state (city/country) location(s) of current production.
- What is the annual amount of product you are currently producing?

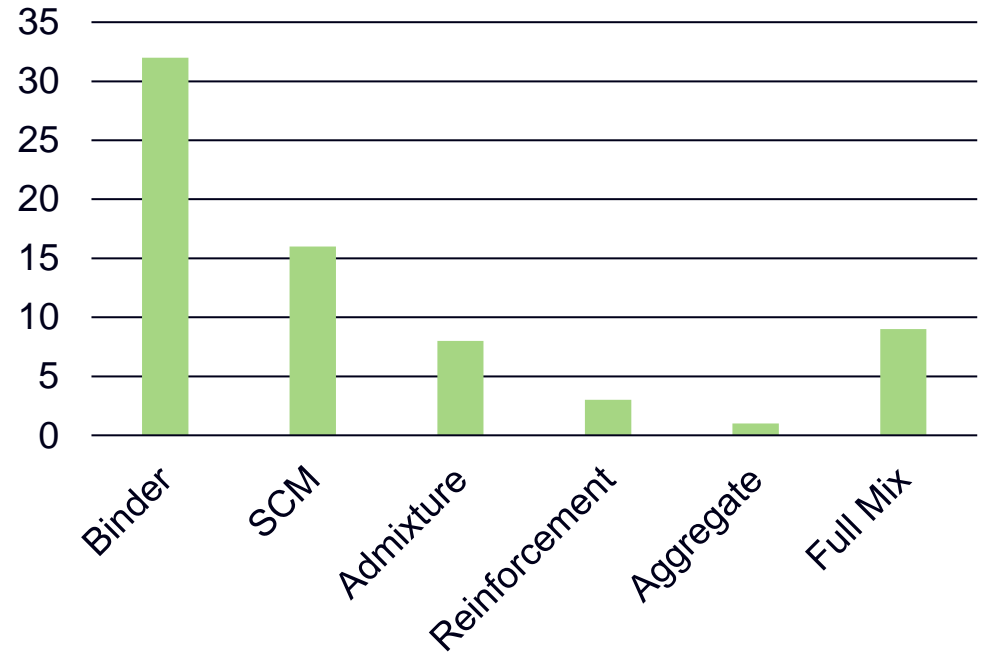
Market Availability and Supply Chain Info

- What raw materials or waste streams does this technology or product rely on?
- Are there any known variability issues based on raw material supplies?
- Describe the possible supply chain issues you currently have or foresee with regard to production of your product.

Technology and Product Methodology

■ Please select the material category that best fits your product:

- Binder/cement
- Supplementary cementitious material
- Aggregate
- Chemical admixture
- Reinforcement
- Full concrete mixture
- Other



**Some companies reported multiple material types

Technology and Product Methodology

- Please provide a brief, easy to understand summary of your technology or material.

- What types of concrete products do you produce, or if your material is a component of concrete, what types of products could it be used in?
 - Ready mixed concrete
 - Precast concrete
 - CMU / Manufactured concrete
 - Any type of concrete product
 - Other



Technology and Product Methodology

- What are the primary applications your product will be used in?
 - Slab on grade (SOG)
 - Slab on metal deck (SOMD)
 - Footings/foundations
 - Structural
 - Exterior hardscape
 - Duct banks
 - Pavements
 - Other



Environmental Claims

- What types of environmental documentation have been completed for your product (please specify if it is for an individual product or a concrete mixture including the product)?
 - Life Cycle Analysis (LCA)
 - Product Category Rule (PCR)
 - Environmental Product Declaration (EPD)
- What is the GWP (global warming potential) of your product?
- Aside from carbon reduction, please summarize any other environmental claims your company makes.



Specifications and Standards

■ Does your product meet any of the following ASTM specifications or standards?

- ASTM C150
- ASTM C595
- ASTM C1157
- ASTM C618
- ASTM C989
- ASTM C1240
- ASTM C1866
- ASTM C1697
- Other



ASTM INTERNATIONAL

Cost

■ In general, how does the cost of concrete made with your product compare to a typical portland cement concrete (PCC)?

- Less expensive than typical PCC
- Similarly expensive to typical PCC
- More expensive than typical PCC
- Other



Thank you!

www.neuconcrete.org

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 **CONCRETE
CONVENTION**

