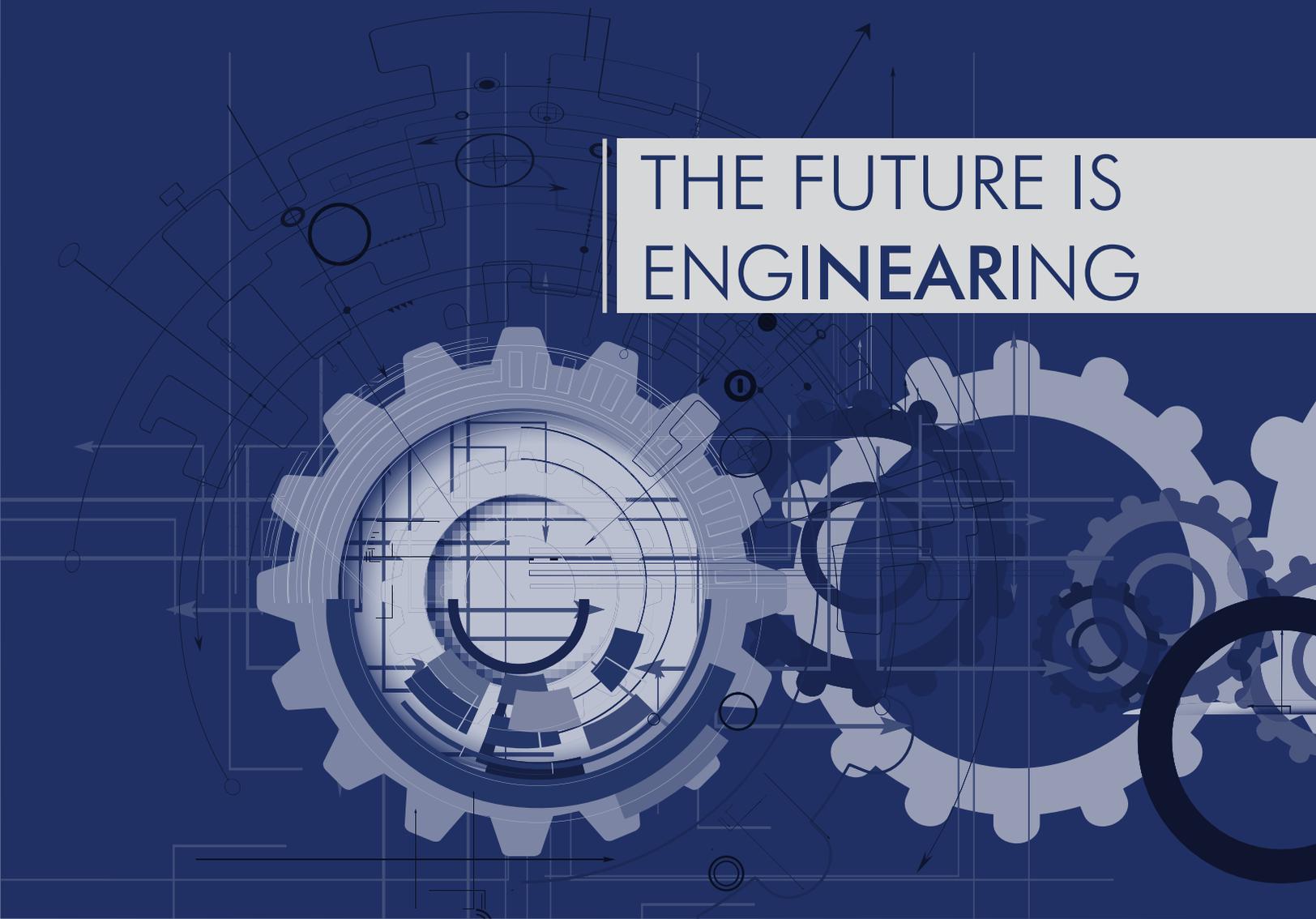




**ENGINEERING
CHANGE LAB USA**

For more on Engineering Change Lab-USA,
contact Executive Director Mike McMeekin
at mikemc@ecl-usa.org and visit our website
www.ecl-usa.org

2021 YEAR IN REVIEW



THE FUTURE IS
ENGINEERING

2021 YEAR IN REVIEW

Engineering Change Lab – USA (ECL-USA) is a catalyst for change within the engineering community, helping it reach its highest potential on behalf of society. In 2021 ECL-USA continued its work in exploring the most important and complex issues impacting the future of engineering. Summit 11 focused on engineering’s role in the challenge of climate change. Summit 12 examined the future of private sector engineering firms. The second edition of the Engineering Ideas Institute represented our return to in-person events with a focus on engineering in an age of acceleration and engineering and racial justice. We also initiated work on two focused initiatives that resulted from discussions at our summits – the Future of Licensure initiative and the Climate Change Noble Purpose for Engineering initiative. A third initiative related to engineering and racial justice is under consideration. In addition, we ramped up our efforts to share our message and our work with the Engineering Community through 17 presentations to engineering organizations across the country. We thank those who have supported our work in any way.

ECL-USA Steering Committee



Mike McMeekin
Executive Director



Kyle Davy
Creative Director &
Lead Facilitator



Stacy Bartoletti
Degenkolb
Engineers



Lauren Evans
Pinyon
Environmental



Edwin Friedrichs
Walter P. Moore



Dan Linzell
University of Nebraska
College of Engineering



Nancy Pridal
Lamp Rynearson



Clint Robinson
Black & Veatch



Amy Squitieri
Mead & Hunt



Bill Stout
Gannett Fleming



Markus Weidner
Pennoni

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2021 ECL-USA Summits

Summit 11 Engineering and the Grand Challenge of Climate Change - March 22, 2021

LEARNING & TAKE-AWAYS

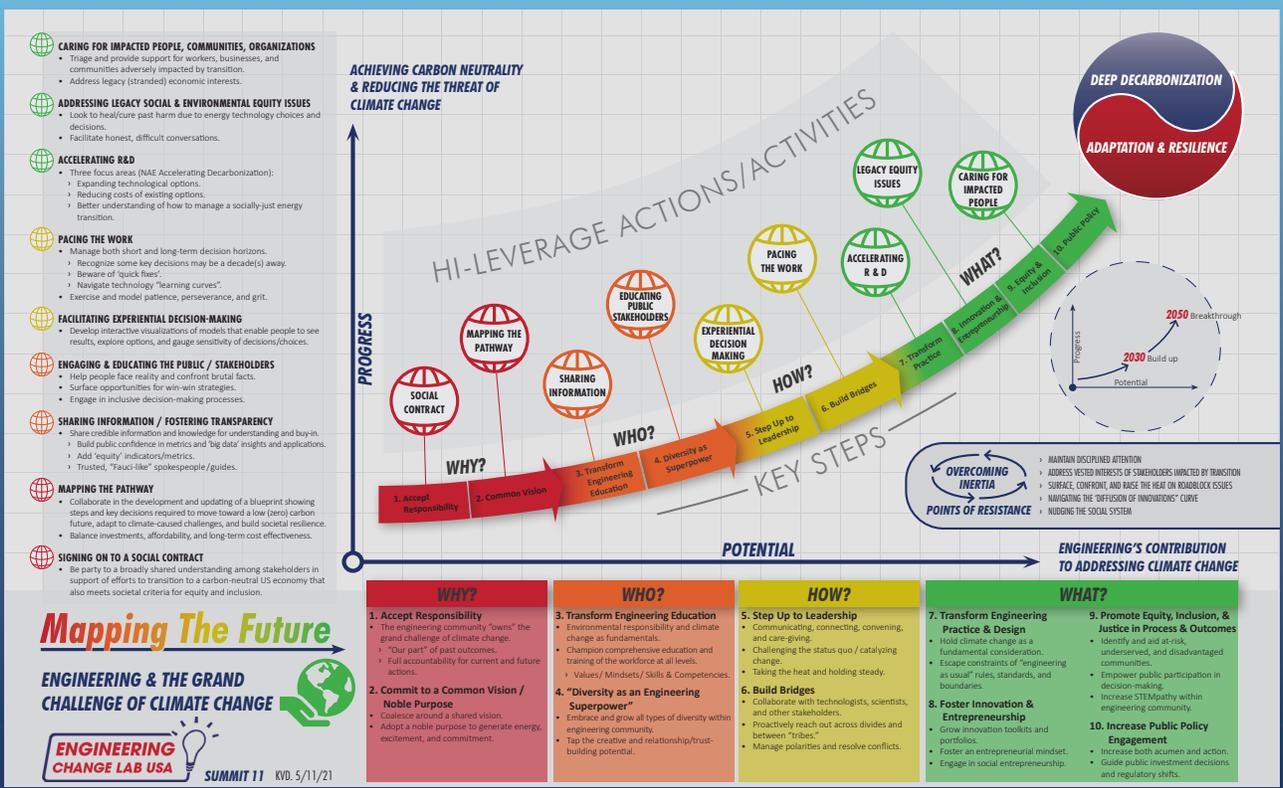
Exploring California's Climate Change Future – Major Contributions from the Engineering Community

- › Technological Innovations and Entrepreneurship Across all Facets of the Energy System.
- › Innovations and Advanced Application of Natural Climate Solutions.
- › New Approaches to Transportation.
- › Advances in Infrastructure Resilience.
- › Leadership in Education of the Public, Driving Behavior Change.
- › Leadership in Science-Based Public Policy Shifts.

Success Factors for the Engineering Community

- › Coalescence Around a Common Climate Vision.
- › Development of a Nationally Known Climate Change Scorecard.
- › Emergence of Trusted, “Fauci-Like” Engineering Community Spokespersons.
- › Transformation of Engineering Education to Emphasize Sustainability and Climate Change.
- › Major Progress in Improving Diversity and Inclusivity.
- › Openness to Multi-Disciplinary Collaboration.
- › Focus on Racial and Environmental Equity in the Transition of the Energy System.

“ THERE WILL BE NO VACCINE FOR SEA LEVEL RISE. ”
 – Summit 11 Provocateur, Dr. Bill Rouse, McCourt School of Public Policy, Georgetown University



Summit 12 – The Engineering Firm of the Future - June 16, 2021

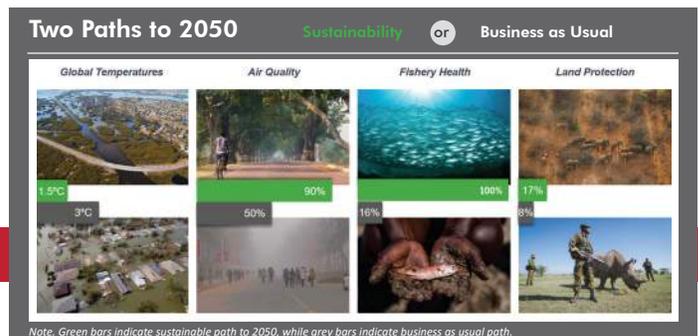
LEARNING & TAKE-AWAYS

Imagining New Value Propositions & Models of Practice Emerging from Client Risks (Economic, Environmental, & Technological)

- › Public sector clients will need assistance in thinking bigger and more creatively with respect to funding and revenue generation and in broadening perspectives regarding environmental challenges.
- › Public sector and institutional clients will need assistance in recognizing the importance of investments in resilience.
- › Firms can create value by assisting public sector clients in thinking beyond outdated processes and standards.
- › Private sector clients will need guidance in developing a long-term perspective and in responding to a wider and more diverse groups of project stakeholders.
- › Opportunities for firms will emerge from embracing increased diversity.
- › Firms will recognize that the complexity of future challenges can only be addressed by greater collaboration and through new partnerships.
- › Financial metrics for firms will need to incorporate long-term, holistic value creation strategies.
- › To contribute at higher levels and to escape current commoditized financial models, firms will need to adapt their cultures to accept more of an entrepreneurial mindset.

Adapting to the Aspirations, Values and Needs of New Generations in the Workforce.

- › The firm of the future will need to find a balance between traditional practice and new demands for attention to environmental practice and social justice in its project work.
- › Firms will need to be aware of potential tension between the environmental and social values of young professionals and traditional project delivery and performance metrics.
- › There is evidence now of the emergence, in some firms, of these tensions, of efforts to provide young staff with a greater voice in decision-making, and of shifts in types of projects being pursued (or not pursued) based on employee interests.
- › There are factors in the current environment that limit firms' ability to adapt to new values and mindsets – risk management, firm inertia, and public-sector procurement practices and standards.
- › Conflict could also manifest when client goals and objectives clash with the values of young professionals in firms.
- › To constructively confront these types of conflicts, firms need to create safe cultures that support dialogue and reflective practices.
- › There is a clear need for investments in training and development related to entrepreneurship.
- › Firms are seeing the need for shifts in policies to support women employees and maintain diversity.
- › Firm leaders will need to adapt their thinking and their practices to accommodate emerging values and aspirations.

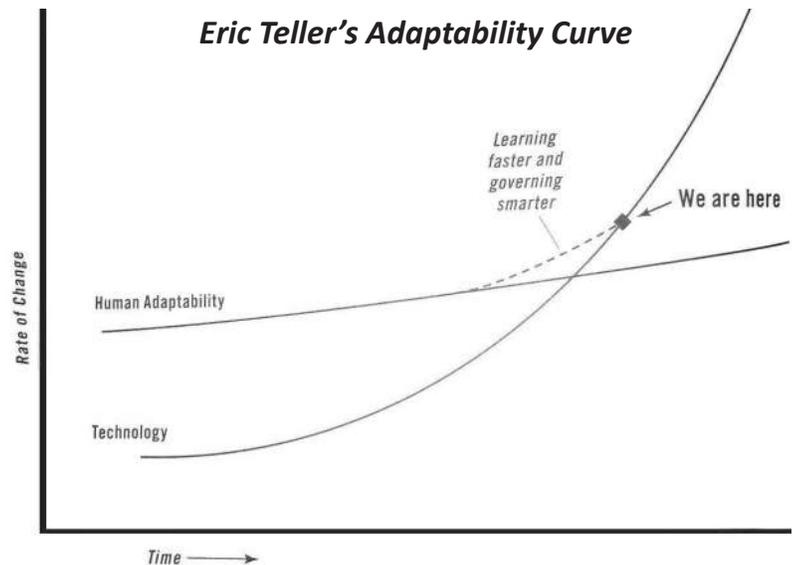


Summit 13 – The Engineering Ideas Institute II - October 11-13, 2021

LEARNING & TAKE-AWAYS

Bridging the Gap Between Technological Acceleration and Human Adaptability / Strategies for Engineering Leadership

- › We should lead the push for adaptations in codes and standards that deal with social and environmental externalities.
- › The Engineering Community should aggressively and ethically step up our public face in educating the public and politicians regarding the values and risks of technology, leveraging our trustworthiness.
- › Engineering licensure and its primary focus on technical knowledge needs to be addressed.
- › We need to shift to a mindset of “agency” rather than waiting for others.
- › There is a need to engage the public sector in planning for the future of engineering through collaborative leadership.



Bridging the Gap Through Community-Building.

According to Thomas Friedman in his book, Thank You for Being Late, the key to bridging the gap is to work toward strong and resilient communities. Friedman states that “when people are embedded in a community they feel “protected, respected, and connected” ... which generates enormous trust. He also offers that “when people trust each other ... people in the community can be much more adaptable and open ... (and) more inclined to ...”

- › Think long term.
- › Collaborate and experiment.
- › Be open to others, to new ideas, and to novel approaches.
- › Extend the Golden Rule to others.
- › Feel free to fail ... and learn.
- › Take ownership of problems and practice stewardship.

The Engineering Community, through its agency based on trust and relationships, can play a major role in building/rebuilding communities and contributing to an upswing back toward a more community-minded society.

There is only one way to thrive now, and it's by finding and creating your own eye (of a hurricane). It draws energy from it, while creating a sanctuary of stability inside it. It is both dynamic and stable - and so must we be. The closest political analogue for the eye of a hurricane that I can think of is a healthy community.

From Thank You for Being Late by Thomas Friedman





Summit 13 – The Engineering Ideas Institute II - October 11-13, 2021

ENGINEERING AND RACIAL JUSTICE

This section of the Engineering Ideas Institute looked at engineering's relationship to racial inequality (past and present) and explored ways that the engineering community needs to change to contribute to creating a more just and equitable society in the future. We approached this complex and sensitive issue across four dimensions



Becoming Aware – of how some aspects of engineering have contributed to inequality. While this is only one part of our history, it represents a significant, under-told and under-considered story.



Educating Ourselves – listening to understand the perspectives of people in minority communities that have been impacted by racism.



Accepting Responsibility – from a place of deep knowing, as a necessary step in re-thinking how the engineering community can change to help create stronger, more equitable communities and a more just society.



Taking Action – recognizing that this is a “wicked” problem with no easy solutions; not being constrained by the idea that we only implement the ideas and decisions of others; and re-defining our work as a people- and community-based enterprise.



When machines and computers, profit motives, and property rights are considered more important than people, the giant triplets of racism, extreme materialism, and militarism are incapable of being conquered.

– Dr. Martin Luther King



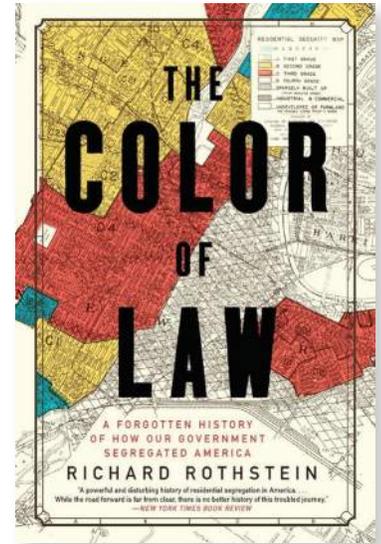
BECOMING AWARE LEARNING & TAKE-AWAYS

- › We have all been part of an “out-group” at some point in our lives which highlights the need for compassion and an open mind regarding the experiences of others.
- › “In-group / out-group” cultures have impacts on structural and systemic power within organizations.
- › **We need a “both-and” approach to our work – solving technical problems, while also recognizing the impacts of our work on racial equity and communities.**



EDUCATING OURSELVES LEARNING & TAKE-AWAYS as Informed by **The Color of Law**

- › Some engineering work has been done with a blatant disregard for the impacts on communities.
- › We need to listen to the stories of the impacts of our work on communities.
- › We need to be leading community conversations to drive change.
- › There are still elements of corruption in the engineering and construction industries and in community level institutions that need to be rooted out.
- › We may not fully understand the situations faced by our predecessors, but we can still learn from history.
- › We need to be aware of current local situations that are producing inequities, such as gentrification and pushback from wealthy neighborhoods regarding affordable housing initiatives.
- › Can we help produce change in the decision-making processes that currently limit our influence?



ACCEPTING RESPONSIBILITY

The Engineering Community has agency. We are at the table. We have knowledge that we can use to educate others.



TAKING ACTION LEARNING & TAKE-AWAYS

- › There is a need to educate the engineering community without placing blame for unintended consequences.
- › Challenges include the long-term nature of the problem, the need to change the mentality of doing the minimum required by clients, and some members of the engineering community will not be interested.
- › Equity needs to be brought into project discussions earlier with a new mindset that goes beyond “problem solving” and quick solutions.
- › We can learn from the many documented case studies that exist. Involve the impacted communities.
- › This approach will build trust with the public.
- › Younger generations will value this effort.
- › **Possibilities for action exist within both ourselves and our organizations.**



Do the best you can until you know better. Then when you know better, do better.

– Maya Angelou



Summit-13-Report-Engineering-Racial-Justice.pdf (ecl-usa.org)

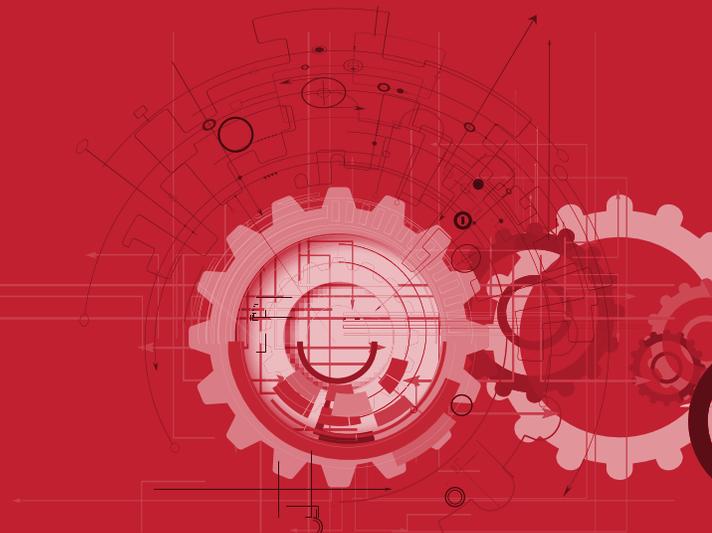
Climate Change Noble Purpose for Engineering

In the final exercise of ECL-USA Summit 11, The Imperative of Climate Change and the Future of Engineering, summit participants reflected on the potential emergence of a “noble purpose” for the engineering community centered on the climate change imperative. The intent of a “noble purpose” is to unite, energize, and motivate people within and across organizations, and to fulfill their desires for meaning and purpose in their work lives.

A final version of the ECL-USA Climate Change Noble Purpose for Engineering Statement is now complete. This statement was prepared with input from a working group of 25 that included representatives from 16 engineering organizations and participants in the ECL-USA Climate Change Summit.

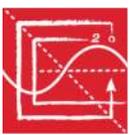
Ultimately, our goal is that this statement will impact the way the engineering community does its work, with a greater emphasis on addressing climate change, both through reducing emissions and adaptation to our changing climate.

Climate change is real - the impacts are serious, and they are accelerating. There is an urgent imperative for the Engineering Community to take informed and intentional actions now to both reduce greenhouse gas emissions and adapt to the impacts of a changing climate. It is our duty and purpose to contribute our skills and knowledge of human-centered technologies and of the natural world to lead humanity out of the climate crisis with a focus on sustainable, resilient, equitable, and innovative approaches.



ECL-USA Financial Supporters

We are grateful to the National Council of Examiners for Engineers and Surveyors for their continued funding of ECL-USA. We are also grateful for the engineering firms that joined NCEES in providing financial support in 2021.



NCEES
*advancing licensure for
engineers and surveyors*



BLACK & VEATCH



2021 Outreach in the Engineering Community

Despite numerous events that were cancelled due to the COVID-19 pandemic, ECL-USA expanded its outreach in the engineering community by presenting or participating in these events.

- › ACEC Missouri Webinar
- › ENR Top Young Professionals Conference
- › ACEC Kansas Board of Directors Presentation
- › Mead & Hunt Foresight
- › Society of Hispanic Professional Engineers LatinXFactor Webinar
- › IEEE Sustainable Development Committee Presentation
- › Geoprofessional Business Association Elevating Our Professional Value Workshop
- › SAME Omaha Presentation
- › Colorado School of Mines Socially Responsible Scientists and Engineers Club
- › C&S Companies Future of Engineering Series – Summit 12 Briefing
- › Geoprofessional Business Association Fall Conference Keynote Presentation
- › ACEC Fall Conference – Women Leaders In ECL-USA Perspective on Summit 12



If you are aware an organization that would be interested in learning about the work of ECL-USA, please contact Mike McMeekin (mikemc@ecl-usa.org).



2022 Events

Join us in 2022 for one of our upcoming events.

- › **Summit 14** – Augmenting the Engineering Workforce Through Technological Innovation, March 15, 2022 ([ECL-USA Summit 14 - Augmenting the Engineering Workforce Through Technological Innovation | Engineering Change Lab – USA](#))
- › **Summit 15** – Technological Stewardship, June 14, 2022 (<https://ecl-usa.org/summit-registration-15/>)
- › **The Engineering Ideas Institute III**, September 26-28, 2022, The Colorado Chautauqua, Boulder, CO (<https://ecl-usa.org/summit-registration-16/>)

Remember to check out the ECL-USA website – www.ecl-usa.org and the ECL-USA LinkedIn page- <https://www.linkedin.com/company/engineeringchangelabusa/> for information on our work.