Engineering Change Lab USA

Description & Agenda
2023 Engineering Ideas Institute
Boulder, CO

September 25 - 27, 2023

In dealing with the future … it is more important to be imaginative and insightful than to be one hundred percent right.”
Alvin Toffler, Future Shock, 1970

Artificial intelligence, autonomous vehicles, climate change and extreme weather events, advances in genetic and biological science, shifting global geopolitics, the new space race, the long tail of COVID, rising income inequality and poverty traps, escalating cybersecurity threats, and imperatives for social and environmental justice. How will the intersection and interaction of these forces, and more, play out in the future? How should the engineering community respond to fulfill its role as stewards of technology and nature on behalf of society? What can the engineering community do today to influence how the future might unfold?

The 2023 ECL-USA Ideas Institute will examine how the engineering community can use scenario thinking to become more agile, flexible, and resilient in the face of an uncertain, complex, and rapidly changing world. Provocateurs, group exercises, nature walks, and personal reflection will be used to challenge assumptions and stretch imaginations as participants collectively create and use scenarios to explore the future of engineering.

Summit Objectives

- Improve habits of paying attention to unfolding trends and conditions.
- Experience the art of crafting future scenarios or “stories of the future.”
- Explore critical challenges facing the engineering community posed by alternative futures, including inquiries with respect to dimensions such as:
    - Emerging technologies
    - New practice paradigms for engineering & the engineering workplace of the 21st Century
    - Macro-ethical challenges
    - Unsticking the engineering pipeline with respect to DEI
    - Engineering the unfolding energy transition to “net zero”
    - Challenges in climate change resilience and adaptation
- Be better prepared for the future that does unfold and enhance decision-making capabilities in the face of uncertainty.
- Recognize signs of major shifts early enough to take appropriate action.
- Set the agenda and identify possible actions that the engineering community can take to influence future events and increase its contribution to society.

Pre-Summit Preparation
Readings / Resources

Required:

- Books:
  - *Imaginable: How to Create a Hopeful Future,* Jane McGonigal, Spiegel & Grau, 2022.

    After you read the book, complete the following two exercises *(Imagination Training: Rules #6 & #7)* suggested by McGonigal:

    1. Look for Clues: *(Chapter 6, page 126, print edition)*
       - *Collect and investigate **five** "signals of change," or "(concrete) real-life examples of how the world is becoming different."*
         - *For each one, ask yourself, "What is this a signal of?"*
       - *As McGonigal notes, you can find signals of change "in the news and on social media, in scientific journals and in TEDx talks, in podcast interviews and at protests". And, you can find one easily by typing "future of [anything]" into your favorite search engine.*
         - *Examples from McGonigal:*
           - *"No Drone Zone"*
           - *"Pizzly Bears"*

    2. Choose Your Own Future Forces *(Chapter 7, page 162, print edition)*
       - *Identify and investigate **three** "future forces," external forces beyond your control that are most likely to affect your life and the lives of members of the engineering community in the next ten years.*
       - *Use your own sources for identifying future forces, or work with any of the lists provided by McGonigal in the book.*
         - *Examples from McGonigal:*
           - *Digital inequality*
           - *mRNA vaccines*

    Please write down your signals of change and future forces and bring them with you to the summit. We will tap into both lists during our scenario planning work.

Optional Recommended Books / Websites:

- Global Risks Report 2023, World Economic Forum, https://www.weforum.org/reports/global-risks-report-2023/

- Videos/Websites:
  - TBD

Optional Summit Team-Based Research

Prior to attending the Ideas Institute, we encourage participants to engage in a “pre-summit research effort” beyond the readings and exercises noted above.

For this research, participants are invited to join a research team of four to five people that will be convened to explore a specific topic related to **S**ocial, **T**echnological, **E**conomic, **E**nvironmental, and **P**olitical (STEEP) trends. We expect that participation in this research option will involve 4 to 6 hours of effort. *(See following Pre-Session Research Guide).*

We will tap into the insights and knowledge gained through this research as the whole group moves through the scenario planning work during the Ideas Institute. This research activity is also designed to help get people participating in the process outside of their normal specialties, exposing them to other possibilities about how the future might unfold.

Our expectation for these teams is to develop a *one-two page executive summary* of research on the topic, which includes identification of other resources (readings, videos, etc.). The research could include interviews of “remarkable” people in this area.

Approximately six weeks before the summit, we will group interested participants into teams, assign topic areas to the teams, and convene a virtual kick-off meeting for each team to outline the process and provide additional guidance for the research efforts.

<u>We strongly encourage participants to consider participating in these research teams as a way of enriching the work during the summit and honing their own skills as future thinkers.</u>

Pre-Session Research Guide

ECL-US 2023 Ideas Institute

July 14, 2023

In the seminal book on scenario planning, *The Art of the Long View*, Peter Schwartz emphasizes the importance of information-hunting and information-gathering as a predecessor to doing futuring work. To replicate this type of research (in an abbreviated process) in preparation for the 2023 Ideas Institute, participants can choose to participate in a team-based research effort.

Teams will be divided into five research areas to prepare an analysis of significant forces and emerging trends that may impact the future the engineering community using a classic scenario planning tools called STEEP Analysis.

The five focus areas for STEEP research include:

Society

Technology

Economics

Environment

Politics

Participants should individually search periodicals, the Internet, and other available sources for information about their assigned research area. They should take note of unfolding trends, significant developments, and things that particularly surprised them as they surveyed the assigned topic. Feel free to tap into the wealth of information and ideas provided in Jane McGonigal's book. **However, caution should be exercised to use trusted or trustworthy sources. (Consider advice provided by Purdue University's OWL writing resource site at:**

https://owl.purdue.edu/owl/research_and_citation/conducting_research/evaluating_sources_of_information/general_guidelines.html)

After completing their research efforts, teams should prepare an executive summary (2 to 3 pages maximum) summarizing key findings. The executive summary should be completed approximately one-week prior to the Ideas Institute *(by Monday, September 18th)* to allow for the documents to be circulated and read by everyone prior to coming to the Ideas Institute the following week.

We will tap into the insights and knowledge gained through this research as we move through the scenario planning work during the Ideas Institute. This research activity is also designed to help get people participating in the process outside of their normal specialties, exposing them to other possibilities about how the future might unfold.

Participants should expect to spend four to six hours doing this research, not including participating in research team meetings/phone calls. Overall, keep it simple and use your best judgment about what data gathering and analysis would yield the most useful insights for the whole group when it convenes, coupled with a recognition of the time constraints that come with the already busy schedules that all the participants in the planning process have.

At the start of their research effort, we will assist the research teams in convening a kick-off meeting (Zoom) to orient people and plan their effort. A possible agenda for this meeting might include:

- Introductions
  - Purpose & desired outcomes of research effort.
- Designation of team leader:
  - Responsible for coordinating scheduling of team calls and communicating results (meeting notes, executive summary).
- Brainstorm a list of issues or questions related to your focus area that could be researched by your team. Prioritize and select.
- Identify sources of information that could be used to explore high priority issues.
  - What resources will you tap to better inform yourselves on the topic and to answer your questions?
  - Are there "remarkable people" that you know that you could interview that might have a particularly interesting take on what the future holds related to your research area?
- Planning your effort:
  - What milestones will you set to guide your progress? When will you meet to discuss and prioritize your findings?
  - Who will take responsibility for preparing the executive summary?
  - Prepare an action plan: What by Who by When

When the research is completed, each team should then meet again to share what they have learned and to summarize and prioritize significant trends and insights that they wish to share with the whole group of Ideas Institute attendees in their Executive Summary.

The Executive Summary should be sent to both Kyle Davy (kyle@kylevdavy.com) and Mike McMeekin (mikemc@ecl-usa.org) for compilation with other group reports and circulation to attendees. Questions about the process please can be directed to Kyle (phone: 510-525-7737, e-mail: kyle@kylevdavy.com).

Annotated Agenda

2023 Engineering Ideas Institute

September 25 - 27, 2023

MONDAY, September 25, 2023

8:00 - 8:30	BREAKFAST
8:30 - 9:00	INTRODUCTION • Welcome & Expectations • Agenda • Ground Rules
9:00 - 9:45	SCENARIO THINKING: LEARNING FROM *IMAGINABLE* • Warm-Up Exercise • Video: *Jane McGonigal TED Talk Excerpt* • Observations from *Imaginable*
9:45 - 10:00	SIGNALS OF CHANGE • Individual Reflection & Posting
10:00 - 10:15	BREAK
10:15 - 10:45	SIGNALS OF CHANGE • Affinity Diagramming & Discussion
10:45 - 11:30	PROVOCATION ○ *Society: Tom Hennes, Thinc Design* ○ *Technology: Martin Ryan, ServiceNow*
11:30 - 12:00	DRIVING FORCES (FUTURE FORCES) • Individual Reflection • Small Group
12:00 - 12:45	LUNCH
12:45 - 2:15	DRIVING FORCES / NATURE WALK • Small Group Discussion / Nature Walk (30 Minutes) • Whole Group Reports & Discussion (60 Minutes) ○ Prioritization (Dot Poll)
2:15 - 3:00	PROVOCATIONS ○ *Energy I: Debbie Chachra, Olin College of Engineering* ○ *Environment: Andrew Bochman, Idaho National Lab*

3:00 - 3:15	BREAK	
3:15 - 4:00	CRITICAL UNCERTAINTIES • Small Group Work • Whole Group Report & Prioritization	
4:00 - 4:45	MAPPING POTENTIAL SCENARIOS • Whole Group Discussion • Choosing Scenarios	
4:45 - 5:00	DAY ONE WRAP UP	
6:00	RECEPTION & DINNER *Dinner & Cash-Bar Reception*	

TUESDAY, September 26, 2023

8:00 - 8:30	BREAKFAST
8:30 - 8:40	DAY TWO CHECK IN • Overnight Reflections
8:40 - 10:00	DEVELOPING THE SCENARIOS • Warm-up Creativity Exercise • Small Group Work
10:00 - 10:15	BREAK
10:15 - 11:15	DEVELOPING THE SCENARIOS • Small Group Presentations • Whole Group Discussion
11:15 - 12:00	PROVOCATIONS • *Macro-Ethics: Rosalyn Berne, University of Virginia* • *Energy II – The Role of the Engineer: Debbie Chachra, Olin College of Engineering*
12:00 - 12:45	LUNCH
12:45 - 1:30	NATURE WALK • *Pairs: Personal reflections on life within selected scenarios.*
1:30 - 2:45	EXPLORING SCENARIOS • Small Group Analysis: ○ *How might the conditions described in the future scenario impact the engineering community?*

- *What are the biggest surprises the engineering community will face as society moves into this future?*
- *What opportunities exist for significantly increasing the contribution that the engineering community makes to society?*
- *What actions should members of the engineering community take in response to conditions outlined in this scenario?*
- *What actions would be obvious mistakes?*
- *What red flags or guideposts can you identify to signal that society is moving toward this future?*

2:45 - 3:00 BREAK

3:00 - 4:00 EXPLORING SCENARIOS

- Small Group Reports
- Whole Group Analysis & Discussion

4:00 - 4:45 PROVOCATIONS

- *Alan Cheville, Bucknell*
- *Athmika Senthikumar*

4:45 - 5:00 DAY TWO WRAP UP

WEDNESDAY, September 27, 2023

8:00 - 8:30 COFFEE

8:30 - 8:45 DAY THREE CHECK IN

- *Overnight Reflections*

8:45 - 10:15 EXPLORING THE SCENARIOS

- *Small Group Work*

  Analysis:
  - *What are the "no brainer" actions that will be important for the engineering community across multiple futures?*
  - *What are "no regrets" actions that may be valuable in some scenarios, less valuable in others, but not damaging in any way?*
  - *What are "contingent possibilities" that may be valuable only in selected futures?*
  - *What are the "no way" actions that would be unacceptable given the prospect of damage in alternative scenarios?*

  In summary:
  - *What opportunities exist for significantly increasing the contribution that the engineering community makes to society?*
  - *What actions should members of the engineering community take in response to conditions outlined in this scenario?*
- *Reports & Whole Group Discussion*

10:15 - 10:30 *BREAK*

10:30 - 11:30 *DIALOGUE:*

- *What have we learned about catalyzing change within the engineering community by imagining and exploring future scenarios?*

11:30 - 12:00 *NEXT STEPS: SCENARIO DEVELOPMENT*

- *Refining, Publishing, Communication*
- *Train the Facilitator Sessions*

12:00 - 12:30 *CLOSING REMARKS*

AFTERNOON WORKSHOPS ON FOCUSED INITIATIVES:

12:30 - 12:45 *WORKING LUNCH BREAK & SERVICE*

12:45 - 4:00 *ADVANCING FOCUSED INITIATIVES*

- *Licensure: Pilot Project*
- *Engineering and Racial Justice & Healing*
- *Climate Change Noble Purpose Statement*
- *Other*

Scenario Planning Train-the-Facilitator
Virtual Learning Experience

Imagining and experiencing scenarios, or “stories of the future,” is a critical way for individuals and organizations to enhance their ability to act and make decisions in the face of the volatile, uncertain, and complex conditions that characterize our current reality. Learning how to design and facilitate basic scenario planning processes can be a significant leadership skill for members of the engineering community to develop.

Following the 2023 Engineering Ideas Institute, Engineering Change Lab - USA (ECL) will offer a virtual “train-the-facilitator” learning experience as a complement to the scenario planning work that participants will engage in during this year’s Institute. The primary objective for this learning experience is to equip interested participants with knowledge and skills that will enable them to design and facilitate scenario planning processes within their own organizations and firms. Content will include:

- Reflections on and lessons learned from the Engineering Ideas Institute scenario planning experience.
- A game plan and template for scenario planning, following the design and process used for the 2023 Engineering Ideas Institute that will cover:
    - Pre-session activities
    - Generating scenarios
    - Using scenarios
    - Recommended resources
- Imagining how to deploy scenario planning in your own organizations and firm.
    - Alternative approaches to consider.
- Facilitation strategies and interventions.

For this train-the-facilitator experience participants will be asked to attend two three-hour virtual sessions scheduled 1 to 2 weeks apart. For more information contact Mike McMeekin (mikemc@ecl-usa.org).

Reading: *The Art of the Long View*, Peter Schwartz, Currency Reprint, 1