



CABLE Conductor Manufacturing Prize

Stage 1 Rules Modification Q&A Webinar

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Agenda



1 Overview of rules and timeline modifications

2 Q&A session

Housekeeping

This webinar is being recorded and will be available on HeroX

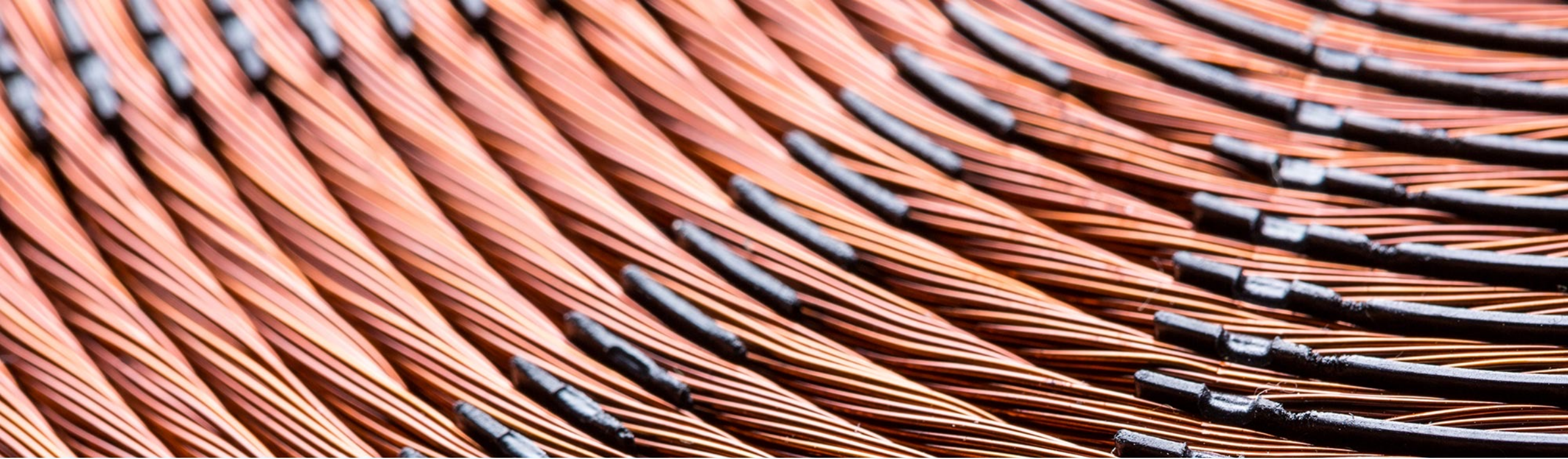
Questions?

- There will be a Q&A session at the end of the presentation.
- To submit a question, please type it into the chat box.

Technical Issues:

- If you experience technical issues, **please check your audio settings under the “Audio” tab.**
- If you continue experiencing issues, contact **Webex support: +1 (866) 229-3239**



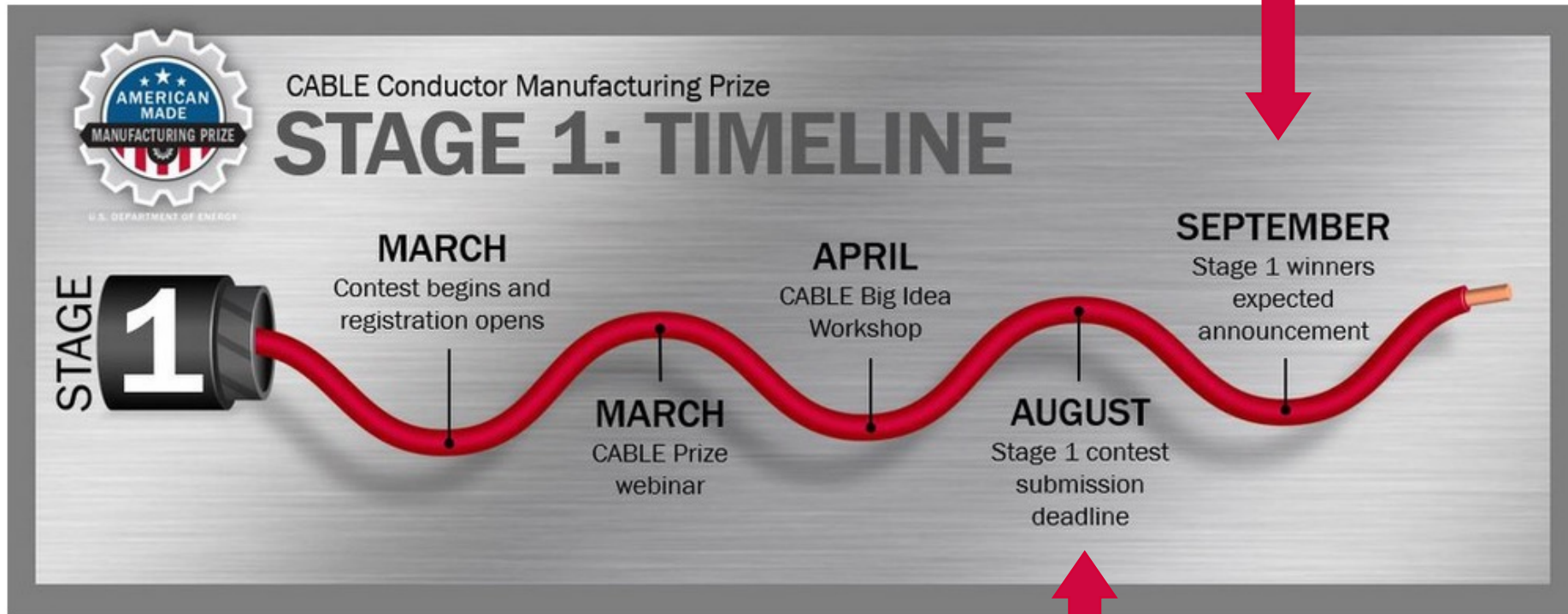


Overview of Rules and Timeline Modifications



Timeline Update

New
Timeline



The winner announcement is moved to September 2021

The submission deadline is extended from June 8 to August 3, 2021

Anticipated Prize Calendar

Date	Event
March 17, 2021	CABLE Conductor Manufacturing Prize announcement Stage 1 contest begins and registration opens
March 30, 2021	Stage 1 contest webinar
April 7-9, 2021	CABLE Big Idea Workshop
August 3, 2021, 5:00 p.m. ET	Stage 1 contest submission deadline
September 2021*	Stage 1 awards announcement
November 2021*	Stage 2 contest begins
August 2022*	Stage 2 contest submission deadline
September 2022*	Stage 2 awards announcement
November 2022*	Stage 3 contest begins
September 2023*	Stage 3 contest submission deadline
October 2023*	Stage 3 awards announcement

Note: new dates
for Stages 2 & 3

**All dates are subject to change.*

Major Rules Modifications

Key Change! Redefined significant enhancements to be in metric units and material-agnostic as the aspirational goals listed are significantly greater than the maximum value for common conductors.

Table 2. Defining Significant Enhancements

Previous

Electrical Conductivity Enhancement Goals

- Ag-enhanced: >113% IACS
- Cu-enhanced: >109% IACS
- Al-enhanced: >67% IACS
- Nonmetal-enhanced: >50% IACS

PROBLEM 1: Implies different standards for different categories of materials without defining them (e.g., how much silver can a Cu/Ag composite have before it must compete under Ag-enhanced goal?)

PROBLEM 2: Fails to reward lightweight conductors that are extremely desirable in many “hard to electrify.”

Table 2. Electrical Conductivity Metrics for Conductors

New Goals

Electrical Conductivity Enhancement Goals

63 MS/m for silver (Ag)

13.3 kSm²/kg for aluminum

- Conductivity-enhanced: >65 MS/m

- Conductivity by density-enhanced²: >14 kSm²/kg

MS is 10⁶ Siemens, kS is 10³ Siemens, m is meters, m² is square meters, kg is kilogram.

Major Rules Modification

Key Changes!

- Amended classes of conductivity-enhanced materials to include those enhanced by processing innovations.
- Lowered the minimum conductivity threshold and switched from IACS to SI units for greater transparency. The lower limit is now 10MS/m instead of 29MS/m.

Definition of “Electrical-conductivity enhanced material”

One that exceeds the minimum standard (10 MS/m) and potentially could be enhanced to or above the levels of the aspirational goals in Table 2.

[this is a revision of the previous minimum standard of 29 MS/m or 50% IACS]

Metal enhanced without nanocarbon

These conductors—metal alloys or metal matrix composites— also contain other metals or non-nanocarbon compounds and/or are enhanced by processing innovations.

Major Rules Modification

APPENDIX A. ELECTRICAL CONDUCTIVITY TABLE

Table A. Electrical Conductivity of Common Conductors

Reference Conductivity Values (MS/m)	
Silver	63
Copper (Electrical)	59
Copper (Annealed Standard)	58
Gold	41
Aluminum	35
Calcium	30
Al 6061-T6	25
Magnesium	23
Tungsten	18
Zinc	17
Brass (Electrical)	15
Nickel	14
Lithium	11
Carbon Nanotubes	11
Iron	10

Concepts will be evaluated on whether the proposed material shows enhanced conductivity at, or above the baseline.

Materials that demonstrate maximum affordability are of interest!

Diversity and Inclusion Update

Key Change! Clarified that the Diversity and Inclusion Plan should be submitted as a separate element in the submission package, not part of the technical narrative.



Competitors are required to submit a **Diversity and Inclusion Plan** as a standalone document that describes the actions the competitor will take to foster a welcoming and inclusive environment, support people from underrepresented groups in STEM, and encourage the inclusion of individuals from these groups in the project. Previously, teams were asked to submit this as part of their technical narrative.

Review Modification Summary



OFFICIAL RULES: MODIFICATIONS SUMMARY

Modifications made to the rules are summarized below and highlighted in the text.

Date	Modifications
Revision 1 5/28/2021	<ul style="list-style-type: none">• Page 5: Clarified type of emissions (Greenhouse gas)• Page 7: Defined units in Table 2.• Page 7: In Table 2, redefined significant enhancements to be in metric units and material-agnostic as the aspirational goals listed are significantly greater than the maximum value for any known conductor. (*note: this summary bullet was updated on 6/3/2021)• Page 7-8 and page 16: Clarified “the Electrical Conductivity Enhancement Goals” and reference to Table 2 (see below).• Page 7-9 and footnote 2: Lowered the minimum conductivity threshold and switched from IACS to SI units for greater transparency. The lower limit is now 10MS/m instead of 29MS/m).• Page 8: Amended classes of conductivity-enhanced materials to include those enhanced by processing innovations.• Pages 9: Contest stages updated to include a definition for the aforementioned material (referencing Table 2).• Page 10: Updated number of required material testing organizations in stage three of the competition to three instead of two.• Page 10-11: Extended Stage 1 deadline from June 8 to August 3, 2021 and subsequent deadlines accordingly.• Page 12: Affordability goal in Stage 1 Goals updated to include GHG emissions reduction as option along with energy cost savings.• Page 14: Provided example of “short description” needed on cover page of submission package (“e.g., slogan”) of Stage 1.• Page 15: Updated judging criteria in Conductor Material Breakthrough section of technical narrative in submission packet to note the baseline update to Table 2.• Page 17: Clarified that the Diversity and Inclusion Plan should be submitted as a separate element in the submission package, not part of the technical narrative.• Page 21: General submission requirements updated to match new minimum conductivity threshold and unit change (see above).• Page 30: APPENDIX A: Electrical Conductivity Table describing the electrical conductivity of common conductors.

2 | CABLE Conductor Manufacturing Prize Official Rules: Stage 1

[https://americanmadechallenges.org/cable/docs/rules/CABLE Prize Official Rules.pdf](https://americanmadechallenges.org/cable/docs/rules/CABLE_Prize_Official_Rules.pdf)



Q&A Session

For questions not covered during the webinar, please submit them on HeroX
<https://www.herox.com/cable/forum>



U.S. DEPARTMENT OF ENERGY

Thank you!