Appendix C: 2022 AMR Hydrogen Program Review Questions

Dear Hydrogen Program Reviewer: We appreciate your input on the U.S. Department of Energy (DOE) Hydrogen Program and subprograms. Please provide your scores and comments on the questions below *based on the Annual Merit Review (AMR) sessions you attended and your particular areas of expertise and focus*. You may answer as many questions as you like; blank or N/A scores will not affect the merit review results. Your comments will be useful in helping to guide future DOE program strategies and priorities.

For each question you answer, please provide comments (as applicable) on the overall Hydrogen Program (including activities in the Office of Energy Efficiency and Renewable Energy [EERE], Office of Fossil Energy and Carbon Management, Office of Science, Office of Nuclear Energy, and ARPA-E) as well as the subprogram/activity areas in the EERE Hydrogen and Fuel Cell Technologies Office (HFTO). (Note: Hydrogen Technologies includes activities in hydrogen production, delivery/infrastructure, and storage. Technology Acceleration includes technology demonstrations/validation, manufacturing research and development [R&D], and market transformation activities.)

Please refer to the AMR's plenary program for overview presentations on the overall DOE Hydrogen Program. Information on specific research, development, demonstration, and deployment (RDD&D) subprograms and activities being carried out by different offices within DOE can be found in the plenary, oral, and poster AMR presentations—see the "AMR Reviewer Information" email sent to you for a list of relevant presentations.

1a. The Hydrogen Program and strategy were clearly articulated and well-aligned with mission and goals of the National Clean Hydrogen Strategy and the Hydrogen Shot.

Please rate your response on a scale of 1 through 10, with 1 indicating that you strongly disagree and 10 indicating that you strongly agree, or N/A if you have no opinion.

	Hydrogen Program Overall
Score	

Comments:

1b. Were the important challenges to meeting goals identified, and were plans to address the challenges articulated?

Comments:

2. The Hydrogen Program is aligned well with industry and stakeholder needs and is appropriate given complementary private-sector, state, and other non-DOE investments.

Please rate your response on a scale of 1 through 10, with 1 indicating that you strongly disagree and 10 indicating that you strongly agree, or N/A if you have no opinion.

	Hydrogen Program Overall
Score	

Comments: Please describe any areas that you feel are not well aligned with industry needs or that require more (or less) federal funding support.

3. The Hydrogen Program is collaborating with and gathering feedback from appropriate groups of stakeholders, including those with a focus on workforce development and justice, equity, diversity, and inclusion.

Please rate your response on a scale of 1 through 10, with 1 indicating that you strongly disagree and 10 indicating that you strongly agree, or N/A if you have no opinion.

	Hydrogen Program Overall
Score	

Comments: Please comment on which stakeholders, external groups, or resources (e.g., academia, companies, small businesses, types of industries, states, other agencies) should be more engaged with or leveraged and in what manner.

4. The Hydrogen Program's portfolio of projects is appropriately balanced across research areas to help achieve its mission and goals, and it has an appropriate balance between near-, mid-, and long-term R&D.

Please rate your response on a scale of 1 through 10, with 1 indicating that you strongly disagree and 10 indicating that you strongly agree, or N/A if you have no opinion.

	Hydrogen Program Overall
Score	

Comments: Please describe any over- or under-represented areas, including any gaps in the portfolio or any comments you may have on whether funding levels in each area are appropriate.

5a. The subprograms of HFTO have clearly articulated their missions and strategies and have appropriate goals, milestones, and quantitative metrics.

For the HFTO subprogram(s) you are evaluating, rate your response on a scale of 1 through 10, with 1 indicating that you strongly disagree and 10 indicating that you strongly agree, or N/A if you have no opinion.

	Hydrogen Technologies	Fuel Cell Technologies	Technology Acceleration	Safety, Codes and Standards	Systems Analysis
Score					

Comments:

5b. Were the important challenges to meeting these goals identified, and were plans to address the challenges articulated?

Comments:

6. HFTO subprograms are effectively fostering innovation and advancing the state of technology for hydrogen and fuel cell technologies to be competitive and achieve widespread commercialization and adoption by industry.

For the HFTO subprogram(s) you are evaluating, rate your response on a scale of 1 through 10, with 1 indicating that you strongly disagree and 10 indicating that you strongly agree, or N/A if you have no opinion.

	Hydrogen Technologies	Fuel Cell Technologies	Technology Acceleration	Safety, Codes and Standards	Systems Analysis
Score					

Comments: Please include recommendations on any novel or innovative ways to address the challenges and achieve the Hydrogen Program goals, including the challenge to meet the Hydrogen Shot production cost goal of $1 per kilogram of hydrogen in 1 decade.

7. The HFTO subprogram's portfolio of projects is appropriately balanced across research areas to help achieve its mission and goals, and it has an appropriate balance between near-, mid-, and long-term R&D.

For the HFTO subprogram(s) you are evaluating, rate your response on a scale of 1 through 10, with 1 indicating that you strongly disagree and 10 indicating that you strongly agree, or N/A if you have no opinion.

	Hydrogen Technologies	Fuel Cell Technologies	Technology Acceleration	Safety, Codes and Standards	Systems Analysis
Score					

Comments: Please describe any over- or under-represented areas, including any gaps in the portfolio or any comments you may have on whether funding levels in each area are appropriate.

8. The Hydrogen Program also collaborates with other countries through several international partnerships, such as the International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE), Clean Energy and Hydrogen Ministerials, Mission Innovation, the International Energy Agency, and others. Please comment on actions DOE can undertake in conjunction with these or other international activities that can effectively accelerate U.S. progress in hydrogen and fuel cell technologies.

Comments:

9. Do you have any comments or recommendations on the Hydrogen Program's research consortia approach for conducting laboratory-supported research (e.g., H2NEW, M2FCT, HydroGEN, HyMARC, ElectroCat, and H-Mat)? Please state what is working effectively and areas that may benefit from further improvement.

Comments:

10. Is the Hydrogen Program sufficiently incorporating a diversity of approaches for improving justice, equity, diversity, and inclusion in the execution and impacts of its RDD&D activities (e.g., multi-disciplinary approaches to project/research design, demographic diversity in project input and execution, diversity in geographic applications/impact of research efforts)? Please provide any recommendations for additional approaches or strategies the Hydrogen Program can employ.

Comments:

11. Is the Hydrogen Program doing enough to advance goals for workforce development and science, technology, engineering, and mathematics (STEM) education? How can we build on and/or adjust our current portfolio to accomplish our goals in workforce development and STEM?

Comments:

12. Please comment on the overall effectiveness, strengths, or weaknesses of the Hydrogen Program or the individual subprograms and provide any additional suggestions you may have for improvement. Do any of the projects, subprograms, or activities stand out as particularly strong or weak (and if so, why?)

Comments: Please include comments or recommendations on how the Hydrogen Program can better coordinate RDD&D among DOE offices (Office of Energy Efficiency and Renewable Energy, Office of Fossil Energy and Carbon Management, Office of Nuclear Energy, Office of Science, ARPA-E, Office of Electricity, Office of Clean Energy Demonstrations).

13. Do you have any specific comments on the Hydrogen Program's plans for the funding provided under the Bipartisan Infrastructure Law (BIL) for (1) Regional Clean Hydrogen Hubs, (2) Clean Hydrogen Electrolysis Program, or (3) Clean Hydrogen Manufacturing and Recycling?

Comments:

14. Based on DOE's hydrogen activities, and given the BIL funding across the RDD&D spectrum, how likely do you think it is that:

a) Hydrogen Shot will be achieved ($1/kg clean H_2 by 2031)?*

	10 – very likely 1 – not likely
Score	

b) The BIL target of $2/kg clean H_2 will be achieved by 2026?*

	10 – very likely 1 – not likely
Score	

** Note: these are modeled levelized costs of production only, at high volumes (e.g., gigawatt-scale).*