

## General Project Evaluation Form

This evaluation form is for use with the following Hydrogen and Fuel Cells subprogram and project category review panels/projects: Hydrogen Fuel R&D (Hydrogen Production R&D and Hydrogen Storage); Fuel Cell R&D; Infrastructure and Systems R&D (Hydrogen Infrastructure R&D, Technology Acceleration, and Systems Analysis; and Safety, Codes and Standards.

### Evaluation Criteria: U.S. Department of Energy (DOE) Hydrogen and Fuel Cells Program Annual Merit Review

*Please provide specific, concise comments to support your evaluation. It is important that you write in full sentences and clearly convey your meaning to prevent incorrect interpretation.*

#### 1. Approach

To performing the work – the degree to which project objectives and critical barriers have been clearly identified and are being addressed, and the extent to which the project is well-designed, feasible, and integrated with other relevant efforts. **(Weight = 20%)**

**4.0 - Outstanding.** Sharply focused on overcoming critical barriers; difficult to improve significantly.

**3.5 - Excellent.** Effective; contributes to overcoming most barriers.

**3.0 - Good.** Generally effective but could be improved; contributes to overcoming some barriers.

**2.5 - Satisfactory.** Has some weaknesses; contributes to overcoming some barriers.

**2.0 - Fair.** Has significant weaknesses; may have some impact on overcoming barriers.

**1.5 - Poor.** Minimally responsive to project objectives; unlikely to contribute to overcoming the barriers.

**1.0 - Unsatisfactory.** Not responsive to project objectives; unlikely to contribute to overcoming the barriers.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good
- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Approach to performing the work:**

#### 2. Accomplishments and Progress

Toward overall project and DOE goals – the degree to which progress towards project objectives has been made and measured against well-defined performance indicators, and the degree to which the project has demonstrated progress toward addressing critical barriers to achieving DOE goals. **(Weight = 45%)**

**4.0 - Outstanding.** Outstanding progress towards project objectives is demonstrated through clear and measurable performance indicators; results have directly led to overcoming one or more critical barriers.

**3.5 - Excellent.** Excellent progress towards project objectives is demonstrated through clear and measurable performance indicators; results suggest that one or more critical barriers will be overcome.

**3.0 - Good.** Significant progress has been made, but there are weaknesses that need to be addressed to improve the rate of progress or improve the clarity of the project's objectives and performance indicators; contributes to overcoming some barriers.

**2.5 - Satisfactory.** Moderate progress has been made, but there are weaknesses that need to be addressed to improve the rate of progress or improve the clarity of the project's objectives and performance indicators; contributes to overcoming some barriers.

**2.0 - Fair.** Modest progress -- rate of progress has been slow; may have some impact on overcoming barriers.

**1.5 - Poor.** Minimal progress towards project objectives and poorly defined performance indicators; unlikely to contribute to overcoming the barriers.

**1.0 - Unsatisfactory.** Little to no demonstrated progress toward project objectives; unlikely to contribute to overcoming the barriers.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good
- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Accomplishments and Progress toward overall project and DOE goals:**

### 3. Collaboration and Coordination with Other Institutions

The degree to which the project effectively engages and coordinates project partners and interacts with other entities and projects to accelerate project progress and improve the likelihood of the project's success and impact. **(Weight = 10%)**

**4.0 - Outstanding.** Close, appropriate collaboration with other institutions; partners are full participants and well-coordinated.

**3.5 - Excellent.** Good collaboration; partners participate and are well-coordinated.

**3.0 - Good.** Collaboration exists; partners are fairly well-coordinated.

**2.5 - Satisfactory.** Some collaboration exists; coordination between partners could be significantly improved.

**2.0 - Fair.** A little collaboration exists; coordination between partners could be significantly improved.

**1.5 - Poor.** Most work is done at the sponsoring organization with little outside collaboration; little or no apparent coordination with partners.

**1.0 - Unsatisfactory.** No apparent coordination with partners.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good
- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Collaboration and Coordination with other institutions:**

**4. Relevance/Potential Impact**

The degree to which the project supports and advances progress toward the Hydrogen and Fuel Cells Program goals and objectives, as delineated in the Multi-Year RD&D plan and/or the Program and sub-program overview presentations from the 2019 AMR. **(Weight = 15%)**

**4.0 - Outstanding.** Project is critical to the Hydrogen and Fuel Cells Program and has potential to significantly advance progress toward DOE RD&D goals and objectives.

**3.5 - Excellent.** The project aligns well with the Hydrogen and Fuel Cells Program and DOE RD&D objectives and has the potential to advance progress toward DOE RD&D goals and objectives.

**3.0 - Good.** Most project aspects align with the Hydrogen and Fuel Cells Program and DOE RD&D objectives.

**2.5 - Satisfactory.** Project aspects align with some of the Hydrogen and Fuel Cells Program and DOE RD&D objectives.

**2.0 - Fair.** Project partially supports the Hydrogen and Fuel Cells Program and DOE RD&D objectives.

**1.5 - Poor.** Project has little potential impact on advancing progress toward the Hydrogen and Fuel Cells Program and DOE RD&D goals and objectives.

**1.0 - Unsatisfactory.** Project has little to no potential impact on advancing progress toward the Hydrogen and Fuel Cells Program and DOE RD&D goals and objectives.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good
- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Relevance/Potential Impact:**

## 5. Proposed Future Work

The degree to which the project has effectively planned its future in a logical manner by incorporating appropriate decision points, considering barriers to its goals and, when sensible, mitigating risk by providing alternate pathways.

**Note:** if a project has ended, please select "Not Applicable." (**Weight = 10%**)

**4.0 - Outstanding.** Plans clearly build on past progress and are sharply focused on critical barriers to project goals; difficult to improve significantly.

**3.5 - Excellent.** Effective; contributes to overcoming most barriers.

**3.0 - Good.** Plans generally build on past progress and should contribute to overcoming some barriers.

**2.5 - Satisfactory.** Has some weaknesses; contributes to overcoming some barriers.

**2.0 - Fair.** Plans may lead to improvements, but need better focus on addressing project weaknesses; may have some impact on overcoming barriers.

**1.5 - Poor.** Minimally responsive to project objectives; unlikely to resolve project weaknesses and contribute to overcoming barriers.

**1.0 - Unsatisfactory.** Not responsive to project objectives; unlikely to contribute to overcoming barriers.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good
- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Proposed Future Work:**

### SUMMARY OF REVIEWER COMMENTS

**Project Strengths:**

**Project Weaknesses:**

**Recommendations for Additions/Deletions to Project Scope:**

## HydroGEN Seedling Project Evaluation Form

This evaluation form is for use with HydroGEN seedling projects.

### Evaluation Criteria: U.S. Department of Energy (DOE) Hydrogen and Fuel Cells Program Annual Merit Review

*Please provide specific, concise comments to support your evaluation. It is important that you write in full sentences and clearly convey your meaning to prevent incorrect interpretation.*

#### 1. Approach

To performing the work – the degree to which barriers have been clearly identified, and are being addressed through project innovation; and the extent to which the project is well-designed, feasible, and integrated with the HydroGEN Consortium network. A strong emphasis should be placed on the appropriateness of the budget period 1 scope of work toward validation of the project’s technology innovation. **(Weight = 20%)**

**4.0 - Outstanding.** Sharply focused on critical barriers and validating technology innovation; difficult to improve significantly.

**3.5 - Excellent.** Effective; contributes to overcoming most barriers and validating technology innovation.

**3.0 - Good.** Generally effective but could be improved; contributes to overcoming some barriers and validating technology innovation.

**2.5 - Satisfactory.** Has some weaknesses; contributes to overcoming some barriers and validating technology innovation.

**2.0 - Fair.** Has significant weaknesses; may have some impact on overcoming barriers and/or validating technology innovation.

**1.5 - Poor.** Minimally responsive to project objectives; unlikely to contribute to overcoming the barriers or validating technology innovation.

**1.0 - Unsatisfactory.** Not responsive to project objectives; unlikely to contribute to overcoming the barriers or validating technology innovation.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good
- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Approach to performing the work:**

## 2. Relevance/Potential Impact

The degree to which the project supports and advances progress toward the DOE Hydrogen and Fuel Cells Program goals and objectives, and also supports the HydroGEN Consortium mission. A strong emphasis should be placed on the project's potential to advance the discovery and development of novel, advanced water splitting materials systems which will enable meeting the DOE ultimate hydrogen production goal of \$2/kg H<sub>2</sub>. An additional factor to consider is how well the project fits into, leverages, and potentially enhances the framework and resources of the HydroGEN Consortium. **(Weight = 15%)**

**4.0 - Outstanding.** Project is critical to the Hydrogen and Fuel Cells Program and has potential to significantly advance progress toward DOE RD&D goals and objectives and is significantly leveraging and contributing to the resources and framework of the HydroGEN consortium.

**3.5 - Excellent.** The project aligns well with the Hydrogen and Fuel Cells Program and DOE RD&D objectives and has the potential to advance progress toward DOE RD&D goals and objectives and is aptly leveraging and contributing to the resources and framework of the HydroGEN consortium.

**3.0 - Good.** Most project aspects align with the Hydrogen and Fuel Cells Program and DOE RD&D objectives and the project is adequately leveraging and contributing to the resources and framework of the HydroGEN consortium.

**2.5 - Satisfactory.** Project aspects align with some of the Hydrogen and Fuel Cells Program and DOE RD&D objectives and the project is leveraging and contributing to the resources and framework of the HydroGEN consortium to some extent.

**2.0 - Fair.** Project partially supports the Hydrogen and Fuel Cells Program and DOE RD&D objectives and the project is not adequately leveraging and contributing to the resources and framework of the HydroGEN consortium.

**1.5 - Poor.** Project has little potential impact on advancing progress toward the Hydrogen and Fuel Cells Program and DOE RD&D goals and objectives and the project has minimal interaction with HydroGEN to leverage and contribute to the resources and framework of the HydroGEN consortium.

**1.0 - Unsatisfactory.** Project has little to no potential impact on advancing progress toward the Hydrogen and Fuel Cells Program and DOE RD&D goals and objectives and the project is not leveraging and contributing to the resources and framework of the HydroGEN consortium.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good
- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Relevance/Potential Impact:**

### 3. Accomplishments and Progress

Toward overall project and DOE goals – the degree to which progress has been made and measured against performance indicators, and the degree to which the project has demonstrated progress toward DOE goals as well as the HydroGEN Consortium mission. A particular emphasis should be placed on the strength of the data presented by the accomplishments (including data from the HydroGEN nodes leveraged by the project) in terms of supporting accomplishments. An additional emphasis should be placed on the strength of the project’s budget period 1 Go/No-Go Criteria and on project progress toward meeting this criteria. **(Weight = 30%)**

**4.0 - Outstanding.** Sharply focused on critical barriers with significant and convincing data to support the accomplishments towards ambitious Go/No-Go Criteria; difficult to improve significantly.

**3.5 - Excellent.** Effective; contributes to overcoming most barriers and provides data that considerably supports the accomplishments towards impactful Go/No-Go Criteria.

**3.0 - Good.** Generally effective but could be improved; contributes to overcoming some barriers and provides adequate data to support accomplishments towards meaningful Go/No-Go Criteria.

**2.5 - Satisfactory.** Has some weaknesses; contributes to overcoming some barriers and provides some data to support accomplishments towards adequate Go/No-Go Criteria.

**2.0 - Fair.** Has significant weaknesses; may have some impact on overcoming barriers and has limited data and accomplishments to support the Go/No-Go Criteria; Go/No-Go Criteria may be weak.

**1.5 - Poor.** Minimally responsive to project objectives; unlikely to contribute to overcoming the barriers and meet the Go/No-Go Criteria; Go/No-Go criteria is not adequate or missing.

**1.0 - Unsatisfactory.** Not responsive to project objectives; unlikely to contribute to overcoming the barriers and meet the Go/No-Go Criteria; Go/No-Go criteria is not adequate or missing.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good
- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Accomplishments and Progress toward overall project and DOE goals:**

### 4. Collaboration Effectiveness

With HydroGEN and, if applicable, other research entities – the degree to which the project has engaged with the HydroGEN EMN and has effectively used nodes to accelerate materials development and improve the likelihood of the project’s success and impact. This also includes the effectiveness of project engagement with the broader materials research community, including work with HydroGEN’s cross-cutting benchmarking/protocols (2b) project team, the HydroGEN Data Team, pathway-specific Working Groups, and others. An additional factor is the broader value and impact of the project’s data sharing through the HydroGEN data hub. **(Weight = 25%)**

**4.0 - Outstanding.** Close, appropriate collaboration with other institutions, specifically the HydroGEN Consortium with appropriate use of nodes, contributions to the benchmarking/protocols (2b) project and the HydroGEN Data Hub; partners are full participants and well-coordinated.

**3.5 - Excellent.** Good collaboration, specifically the HydroGEN Consortium with appropriate use of nodes, contributions to the benchmarking/protocols (2b) project and the HydroGEN Data Hub; partners participate and are well-coordinated.

**3.0 - Good.** Collaboration exists with the HydroGEN Consortium and includes node utilization and engagement with the benchmarking/protocols (2b) project and the HydroGEN Data Hub; partners are fairly well-coordinated.

**2.5 - Satisfactory.** Some collaboration exists; coordination between partners could be significantly improved, specifically with respect to the HydroGEN Consortium node utilization activities, and engagement with the benchmarking/protocols (2b) project and the HydroGEN Data Hub.

**2.0 - Fair.** A little collaboration exists; coordination between partners could be significantly improved, specifically with respect to the HydroGEN Consortium node utilization activities, and engagement with the benchmarking/protocols (2b) project and the HydroGEN Data Hub.

**1.5 - Poor.** Most work is done at the sponsoring organization with little outside collaboration; little or no apparent coordination with partners and HydroGEN Consortium.

**1.0 - Unsatisfactory.** No apparent coordination with partners and HydroGEN Consortium.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good
- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Collaboration and Coordination with other institutions:**

**5. Proposed Future Work**

The degree to which the project has effectively planned its potential future work (contingent on the project's continuation past budget period 1) in a logical manner and leverages progress in budget period 1 toward meeting end-of-project goals and advancing the materials research mission of the HydroGEN Consortium. **(Weight = 10%)**

**4.0 - Outstanding.** Sharply focused on critical barriers, meeting end-of-project goals and advancing the materials research mission of the HydroGEN Consortium; difficult to improve significantly.

**3.5 - Excellent.** Effective; contributes to overcoming most barriers, meeting most end-of-project goals and advancing the materials research mission of the HydroGEN Consortium.

**3.0 - Good.** Generally effective but could be improved; contributes to overcoming some barriers, meeting some end-of-project goals and has potential to advance the materials research mission of the HydroGEN Consortium.

**2.5 - Satisfactory.** Has some weaknesses; contributes to overcoming some barriers, meeting some end-of-project goals and may contribute to advancing the materials research mission of the HydroGEN Consortium.

**2.0 - Fair.** Has significant weaknesses; may have some impact on overcoming barriers, make minimal progress towards end-of project goals and insignificantly contributes to advancing the materials research mission of the HydroGEN Consortium.

**1.5 - Poor.** Minimally responsive to project objectives; unlikely to contribute to overcoming the barriers or meet end-of-project goals and will most likely not contribute to advancing the materials research mission of the HydroGEN Consortium.

**1.0 - Unsatisfactory.** Not responsive to project objectives; unlikely to contribute to overcoming the barriers or meet end-of-project goals and is unlikely to contribute to advancing the materials research mission of the HydroGEN Consortium.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good
- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Proposed Future Work:**

**Project Strengths:**

**Project Weaknesses:**

**Recommendations for Additions/Deletions to Project Scope:**

## New Project Evaluation Form

This evaluation form is for use with newly awarded R&D projects presented at the 2019 AMR.

### Evaluation Criteria: U.S. Department of Energy (DOE) Hydrogen and Fuel Cells Program Annual Merit Review

Please provide specific, concise comments to support your evaluation. It is important that you write in full sentences and clearly convey your meaning to prevent incorrect interpretation.

#### 1. Approach

To performing the work – the degree to which project objectives and critical barriers have been clearly identified and are being addressed, and the extent to which the project is well-designed, feasible, and integrated with other relevant efforts. **(Weight = 40%)**

**4.0 - Outstanding.** Sharply focused on overcoming critical barriers; difficult to improve significantly.

**3.5 - Excellent.** Effective; contributes to overcoming most barriers.

**3.0 - Good.** Generally effective but could be improved; contributes to overcoming some barriers.

**2.5 - Satisfactory.** Has some weaknesses; contributes to overcoming some barriers.

**2.0 - Fair.** Has significant weaknesses; may have some impact on overcoming barriers.

**1.5 - Poor.** Minimally responsive to project objectives; unlikely to contribute to overcoming the barriers.

**1.0 - Unsatisfactory.** Not responsive to project objectives; unlikely to contribute to overcoming the barriers.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good
- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Approach to performing the work:**

#### 2. Accomplishments and Progress

Toward overall project and DOE goals – the degree to which progress towards achieving project objectives has been made and measured against well-defined performance indicators, and the degree to which the project has demonstrated progress toward addressing critical barriers to achieving DOE goals. **Note:** Please evaluate accomplishments/progress made considering the amount of time the project has been underway; if a project has not been underway long enough to have made any progress, you may select “Not Applicable.” **(Weight = 10%)**

**4.0 - Outstanding.** Outstanding progress towards project objectives is demonstrated through clear and measurable performance indicators; results have directly led to overcoming one or more critical barriers.

**3.5 - Excellent.** Excellent progress towards project objectives is demonstrated through clear and measurable performance indicators; results suggest that one or more critical barriers will be overcome.

**3.0 - Good.** Significant progress has been made, but there are weaknesses that need to be addressed to improve the rate of progress or improve the clarity of the project's objectives and performance indicators; contributes to overcoming some barriers.

**2.5 - Satisfactory.** Moderate progress has been made, but there are weaknesses that need to be addressed to improve the rate of progress or improve the clarity of the project's objectives and performance indicators; contributes to overcoming some barriers.

**2.0 - Fair.** Modest progress -- rate of progress has been slow; may have some impact on overcoming barriers.

**1.5 - Poor.** Minimal progress towards project objectives and poorly defined performance indicators; unlikely to contribute to overcoming the barriers.

**1.0 - Unsatisfactory.** Little to no demonstrated progress toward project objectives; unlikely to contribute to overcoming the barriers.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good
- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Accomplishments and Progress toward overall project and DOE goals:**

### 3. Collaboration and Coordination with Other Institutions

The degree to which the project effectively engages and coordinates project partners and interacts with other entities and projects to accelerate project progress and improve the likelihood of the project's success and impact. **(Weight = 15%)**

**4.0 - Outstanding.** Close, appropriate collaboration with other institutions; partners are full participants and well-coordinated.

**3.5 - Excellent.** Good collaboration; partners participate and are well-coordinated.

**3.0 - Good.** Collaboration exists; partners are fairly well-coordinated.

**2.5 - Satisfactory.** Some collaboration exists; coordination between partners could be significantly improved.

**2.0 - Fair.** A little collaboration exists; coordination between partners could be significantly improved.

**1.5 - Poor.** Most work is done at the sponsoring organization with little outside collaboration; little or no apparent coordination with partners.

**1.0 - Unsatisfactory.** No apparent coordination with partners.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good

- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Collaboration and Coordination with other institutions:**

#### 4. Relevance/Potential Impact

The degree to which the project supports and advances progress toward the Hydrogen and Fuel Cells Program goals and objectives, as delineated in the Multi-Year RD&D plan and/or the Program and sub-program overview presentations from the 2019 AMR. **(Weight = 15%)**

**4.0 - Outstanding.** Project is critical to the Hydrogen and Fuel Cells Program and has potential to significantly advance progress toward DOE RD&D goals and objectives.

**3.5 - Excellent.** The project aligns well with the Hydrogen and Fuel Cells Program and DOE RD&D objectives and has the potential to advance progress toward DOE RD&D goals and objectives.

**3.0 - Good.** Most project aspects align with the Hydrogen and Fuel Cells Program and DOE RD&D objectives.

**2.5 - Satisfactory.** Project aspects align with some of the Hydrogen and Fuel Cells Program and DOE RD&D objectives.

**2.0 - Fair.** Project partially supports the Hydrogen and Fuel Cells Program and DOE RD&D objectives.

**1.5 - Poor.** Project has little potential impact on advancing progress toward the Hydrogen and Fuel Cells Program and DOE RD&D goals and objectives.

**1.0 - Unsatisfactory.** Project has little to no potential impact on advancing progress toward the Hydrogen and Fuel Cells Program and DOE RD&D goals and objectives.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good
- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Relevance/Potential Impact:**

#### 5. Proposed Future Work

The degree to which the project has effectively planned its future in a logical manner by incorporating appropriate decision points, considering barriers to its goals and, when sensible, mitigating risk by providing alternate pathways. **(Weight = 20%)**

**4.0 - Outstanding.** Plans clearly build on past progress and are sharply focused on critical barriers to project goals; difficult to improve significantly.

**3.5 - Excellent.** Effective; contributes to overcoming most barriers.

**3.0 - Good.** Plans generally build on past progress and should contribute to overcoming some barriers.

**2.5 - Satisfactory.** Has some weaknesses; contributes to overcoming some barriers.

**2.0 - Fair.** Plans may lead to improvements, but need better focus on addressing project weaknesses; may have some impact on overcoming barriers.

**1.5 - Poor.** Minimally responsive to project objectives; unlikely to resolve project weaknesses and contribute to overcoming barriers.

**1.0 - Unsatisfactory.** Not responsive to project objectives; unlikely to contribute to overcoming barriers.

- 4.0 - Outstanding
- 3.5 - Excellent
- 3.0 - Good
- 2.5 - Satisfactory
- 2.0 - Fair
- 1.5 - Poor
- 1.0 - Unsatisfactory

**Comments on Proposed Future Work:**

## SUMMARY OF REVIEWER COMMENTS

**Project Strengths:**

**Project Weaknesses:**

**Recommendations for Additions/Deletions to Project Scope:**

## 2019 AMR Hydrogen and Fuel Cells Program Review Questions

**Program Reviewer Fuel Cell Expertise Selection: Are you a reviewer with general Hydrogen and Fuel Cell Program expertise, Solid Oxide Fuel Cell (SOFC) specific expertise or expertise in both program areas? (Your response to this question will change the set of questions that you are asked to evaluate below. You will have the option to skip any questions you do not feel qualified to answer).**

- General Hydrogen and Fuel Cell Program Expertise (Limited or no Solid Oxide Fuel Cell Experience)
- Solid Oxide Fuel Cell Program Expertise Only
- Both Solid Oxide and General Hydrogen and Fuel Cell Program Expertise

**The Hydrogen and Fuel Cells Program has a mission and strategy that are clearly articulated and has appropriate goals and milestones as well as quantitative metrics that are SMART (Specific, Measurable, Actionable, Relevant, and Timely).**

Please comment on the overall Hydrogen and Fuel Cells Program (including activities in the DOE Fuel Cell Technologies Office, Office of Fossil Energy, Office of Science, Office of Nuclear Energy, and ARPA-E) as well as each subprogram/activity area, as appropriate. (Note: Hydrogen delivery is now included under the Hydrogen Infrastructure R&D area. Technology Acceleration includes the prior-year subprograms Technology Validation, Manufacturing R&D, and Market Transformation).

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 NA if you have no opinion. Please add any additional comments.

	Strongly Disagree			Neutral				Strongly Agree			NA
	1	2	3	4	5	6	7	8	9	10	
<b>Hydrogen and Fuel Cells Program Overall</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen Production R&D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen Storage R&D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen Infrastructure R&D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Fuel Cell R&D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technology Acceleration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety, Codes and Standards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Systems Analysis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments:

**The Hydrogen and Fuel Cells Program is well focused and managed, and is effectively fostering research and development (R&D) to enable innovation and advance the state of technology for hydrogen and fuel cell technologies to be competitive and achieve widespread commercialization and deployment by industry.**

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 NA if you have no opinion. Please add any additional comments.

Strongly Disagree			Neutral				Strongly Agree			
1	2	3	4	5	6	7	8	9	10	NA
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments:

**The Hydrogen and Fuel Cells Program’s portfolio of projects is appropriately balanced across research areas to help achieve the Program’s mission and goals.**

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 NA if you have no opinion. Please add any additional comments.

Strongly Disagree		Neutral					Strongly Agree			
1	2	3	4	5	6	7	8	9	10	NA
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments:

**The Hydrogen and Fuel Cells Program’s R&D aligns well with industry and stakeholder needs, and is appropriate given complementary private sector, state and other non-DOE investments.**

Please comment on the overall Hydrogen and Fuel Cells Program as well as each subprogram/activity area, as appropriate.

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 NA if you have no opinion. Please add any additional comments.

	Strongly Disagree		Neutral					Strongly Agree			
	1	2	3	4	5	6	7	8	9	10	NA
<b>Hydrogen and Fuel Cells Program Overall</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen Production R&D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen Storage R&D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen Infrastructure R&D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fuel Cell R&D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Technology Acceleration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety, Codes and Standards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Systems Analysis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments:

**The Hydrogen and Fuel Cells Program is funding high-impact projects that have the potential to significantly advance the state of technology for the hydrogen and fuel cells industry.**

Please comment on the overall Hydrogen and Fuel Cells Program as well as each subprogram/activity area, as appropriate.

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 NA if you have no opinion. Please add any additional comments.

	Strongly Disagree			Neutral				Strongly Agree			NA
	1	2	3	4	5	6	7	8	9	10	
<b>Hydrogen and Fuel Cells Program Overall</b>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen Production R&D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Hydrogen Storage R&D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Hydrogen Infrastructure R&D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Fuel Cell R&D	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Technology Acceleration	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Safety, Codes and Standards	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
Systems Analysis	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Comments:

**In your opinion, what were the most significant accomplishments within the Hydrogen and Fuel Cells Program during the past year? Please consider the entire AMR content and entire DOE portfolio, including poster sessions, rather than the plenary talks alone.**

Please respond for any subprogram/activity area as appropriate (e.g., hydrogen production, hydrogen storage, hydrogen infrastructure, fuel cells, technology acceleration, safety, codes and standards, solid oxide, ARPA-E, Basic Science, etc.).

Please state areas requiring more attention or improvement. If you do not have a response, please select ‘Not Applicable’.

Not Applicable

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**Early-Stage Research and Development: The Hydrogen and Fuel Cells Program is focused on early-stage R&D as aligned with Administration objectives for federal research funding. Please provide suggestions for early stage R&D that the Hydrogen and Fuel Cells Program should consider for promoting its goals and objectives.**

If you do not have a response, please select 'Not Applicable'.

Not Applicable

**Energy Materials Network (EMN) Consortia: Do you have any comments or recommendations on the Hydrogen and Fuel Cell Program's EMN consortia approach? Please state what is working effectively and areas that may benefit from further improvement.**

If you do not have a response, please select 'Not Applicable'.

Not Applicable

**H2@Scale: What are the strengths and weaknesses of the H2@Scale initiative? Do you have any recommendations for other H2@Scale research topics or recommendations to enable the scale up and value proposition of H2@Scale (e.g. a region with low electricity prices, excess curtailment, and hydrogen supply opportunity along with a co-located demand for hydrogen, etc.)? Please provide any other recommendations on H2@Scale.**

If you do not have a response, please select 'Not Applicable'.

Not Applicable

**Collaboration: The Hydrogen and Fuel Cells Program is collaborating with appropriate groups of stakeholders. Please add any additional comments, particularly on which stakeholders (e.g. academia, companies, small businesses, types of industries, etc.) should be more engaged and in what manner.**

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 NA if you have no opinion. Please add any additional comments.

Please also provide recommendations for how the Hydrogen and Fuel Cells Program can better coordinate R&D with other offices in the Department of Energy (e.g., Office of Fossil Energy, Office of Nuclear Energy, Office of Science, ARPA-E, etc.), as well as with entities outside the Department of Energy (e.g. states, other agencies, industry, etc.).

Strongly Disagree			Neutral				Strongly Agree			
1	2	3	4	5	6	7	8	9	10	NA
<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Recommendations:

**International Collaboration: The Hydrogen and Fuel Cells Program collaborates through a number of international partnerships. For example, the International Partnership for Hydrogen and Fuel Cells in the Economy (IPHE) is an international partnership to coordinate activities on hydrogen and fuel cells across 18 countries and the European Commission. The U.S. assumed the chair role for IPHE in 2018. Please comment on actions DOE in conjunction with IPHE can undertake or activities that are effective/need improvement to accelerate progress in hydrogen and fuel cell technologies.**

If you do not have a response, please select 'Not Applicable'.

Not Applicable

**Prizes: Agencies have shown interest in implementing prizes and competitions as a mechanism to complement the conventional grant process. Examples include the H-Prize (H2Refuel) for a small-scale hydrogen fueling appliance that complements large retail stations. Please provide comments on the prize/competition approach and provide any suggestions for future prizes or competitions that would align with the goal of accelerating the widespread success of hydrogen and fuel cell technologies.**

If you do not have a response, please select 'Not Applicable'.

Not Applicable

**Please comment on the overall strengths and weaknesses of the Hydrogen and Fuel Cells Program and its portfolio of projects. Please provide strengths and weaknesses for each subprogram as appropriate. On which technology areas should the Hydrogen and Fuel Cells Program put more or less focus for future activities?**

If you do not have a response, please select 'Not Applicable'.

Not Applicable

**Do you have any other comments or suggestions to improve the overall effectiveness of the Hydrogen and Fuel Cells Program or any of its specific subprograms?**

If you do not have a response, please select 'Not Applicable'.

Not Applicable