

# Programmatic Activities Survey

Start of Block: Programmatic activities

Q1

## NSF Engines Programmatic Activity Survey

### Background

Innovations in science and engineering have enabled the United States to become a world-leading economy, powered by a well-trained scientific and technical workforce. To ensure the United States remains at the vanguard of competitiveness, the United States must rapidly expand its innovation capacity by leveraging the resources, creativity, and ingenuity of every region of the country. The NSF Regional Innovation Engines (NSF Engines) program aims to expand and accelerate scientific and technological innovation within the United States by catalyzing regional innovation ecosystems throughout every region of our Nation to create a future in which all sectors of the American population can participate in and benefit from advancements in scientific research and development equitably to advance U.S. global competitiveness and leadership.

This survey is designed to gather information on each programmatic activity taking place within an NSF Engine. The primary use of the data collected is to inform and enhance the NSF Engines program, so to allow NSF to better serve its community and stakeholders. Data collected from this intake questionnaire will be made available to the external evaluation team of each Engine awardee.

Please note that your responses are automatically saved. You may leave the survey at any time and re-enter where you left off by clicking on the survey link in your invitation email. Questions regarding the survey can be directed to [Enginesdata@nsf.gov](mailto:Enginesdata@nsf.gov).

*Pursuant to 5 CFR 1320.5(b), an agency may not conduct or sponsor, and a person is not required to respond to an information collection unless it displays a valid OMB control number. The OMB control number for this collection is 3145-XXXX. Public reporting burden for this collection of information is estimated to range between 15 to 30 minutes per response, including the time for reviewing instructions. Send comments regarding this burden estimate and any other aspect of this collection of information, including suggestions for reducing this burden, to: Suzanne H. Plimpton, Reports Clearance Officer, National Science Foundation, 2415 Eisenhower Ave., Suite W18200, Alexandria, VA 22314; telephone (703) 292-7556; or send email to [splimpto@nsf.gov](mailto:splimpto@nsf.gov).*

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Q2 You have been identified as the activity lead for *[insert programmatic activity name]* under the *[insert Engine name]*. Please confirm whether this information is correct.

- Yes, I am the activity lead for *[insert programmatic activity name]*
  - No, I am not the activity lead for *[insert programmatic activity name]*
- 

Display This Question:

*If answer option "No, I am not the activity lead for [insert programmatic activity name]" is selected in Q2*

Q3 Do you know who the activity lead is for *[insert programmatic activity name]*?

- Yes, I know who the activity lead is for *[insert programmatic activity name]*
- No, I do not know who the activity lead is for *[insert programmatic activity name]*

Skip To: End of Survey If Q3 = No, I do not know who the activity lead is for *[insert programmatic activity name]*

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Display This Question:

*If answer option "Yes, I know who the activity lead is for [insert programmatic activity name]" is selected in Q3*

Q4 Please provide the name and contact information of the activity lead for *[insert programmatic activity name]*.

- Activity lead name (first and last)

\_\_\_\_\_

- Activity lead email address

\_\_\_\_\_

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Q5 Please provide the legal name of the organization with which you are associated.

\_\_\_\_\_

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Q6 Please provide your organization's Employer Identification Number (EIN).

\_\_\_\_\_

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Q7 Please select which of the following best characterizes your organization.

- Foreign government
- Foreign industry
- Foreign institution of higher education
- Industrial association
- Local government
- Medical facility
- Non-profit
- Private foundation
- Quasi government
- State government
- US federal government
- US industry
- US institution of higher education
- Venture capitalist
- Other (please specify) \_\_\_\_\_

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Display This Question:

If answer option "State government" is selected in Q7

Q8 You indicated that your organization is best characterized as the State government. Please specify which State you represent.

▼ [Drop down list of U.S. States and territories in alphabetical order]

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Q9 Please indicate whether your organization received any funds from *[insert Engine name]* to carry out this activity.

- Yes, my organization received funds from *[insert Engine name]* to carry out this activity
- No, my organization did not receive any funds from *[insert Engine name]* to carry out this activity

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Display This Question:

If answer option "Yes, my organization received funds from *[insert Engine name]* to carry out this activity" is selected in Q9

Q10 As of *[insert current date]*, please estimate (to the nearest thousand) how much money your organization has received from *[insert Engine name]* to carry out this activity.

\_\_\_\_\_

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Q11 Did your organization provide any monetary or in-kind contributions to support *[insert programmatic activity name]*?

- Yes, my organization provided monetary or in-kind contributions to support this activity
- No, my organization did not provide any monetary or in-kind contributions to support this activity

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Display This Question:

If answer option "Yes, my organization provided monetary or in-kind contributions to support this activity" is selected in Q11

Q12 Please indicate the type(s) of contributions your organization provided in support of this activity (select all that apply).

- My organization provided monetary contributions
- My organization provided in-kind contributions
- My organization did not provide any contributions

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Display This Question:

If answer option "My organization provided monetary contributions" is selected in Q12

Q13 Please estimate the amount of monetary contributions (to the nearest thousand) your organization provided in support of this activity. Please enter 0 if none were provided.

- Unrestricted cash \_\_\_\_\_
- Restricted cash \_\_\_\_\_

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Display This Question:

If answer option "My organization provided in-kind contributions" is selected in Q12

Q14 Please estimate the monetary value of the in-kind contributions your organization provided in support of this activity. Please enter 0 if no in-kind contributions were provided.

Equipment \_\_\_\_\_

Equipment access \_\_\_\_\_

Facility access \_\_\_\_\_

Personnel \_\_\_\_\_

Other in-kind contributions  
\_\_\_\_\_

*Display This Question:  
If answer option "Other in-kind contributions" in Q14 is greater than 0*

Q15 Please describe what kind of other in-kind contributions was provided by your organization in support of this activity.

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

Q16 As of [insert current date], please estimate the amount of funding (to the nearest thousand) received from NSF Engines to support this activity.

Amount received (please round to the nearest dollar)  
\_\_\_\_\_

End of Block: Programmatic activities

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Start of Block: Non-partner organization investments

Q17 Please indicate whether any non-Engine funding or investments have been secured to support *[insert programmatic activity name]*.

- Yes, non-Engine funding or investments have been secured to support *[insert programmatic activity name]*
- No outside funding or investments have been secured to support *[insert programmatic activity name]*

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Display This Question:

*If answer option "Yes, non-Engine funding or investments have been secured to support [insert programmatic activity name]" is selected in Q17*

Q18 Please estimate the total amount of funding, donations, or investments received (to the nearest thousand) for each of the following categories, enter 0 if none.

- Venture capital \_\_\_\_\_
- Angel investor \_\_\_\_\_
- Venture philanthropy \_\_\_\_\_
- Local government \_\_\_\_\_
- State government \_\_\_\_\_
- Federal government \_\_\_\_\_
- Other \_\_\_\_\_

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Display This Question:

*If answer option "Other" in Q18 is greater than 0*

Q19 Please describe what entities provided *other* funding or investments.

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Q20 Please enter the number of other partner organizations that were actively involved in or contributed to *[insert programmatic activity name]*.

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End of Block: Non-partner organization investments

Q21 through Q35 are displayed only if the text response in Q20 is greater than or equal to 1.

If text response in Q20 is 0, survey skips to Q36

Start of Block: Partner organization loop

Questions 21 and 22 are repeated X number of times where X is the number of other partner organizations entered in Q20.

Q21 Please provide the name of the other partner organization(s) that were actively involved in or contributed to *[insert programmatic activity name]*.

You are entering information about partner organization *[insert current loop number]*.

Partner organization name

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Q22 Please provide the following information for the partner organization identified above.

Point of contact for partner organization (first and last name)

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Point of contact email address

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End of Block: Partner organization loop

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Start of Block: Partner collaboration and interaction

Q23 Please think about the interactions that have taken place with the partner organization(s) you identified for *[insert programmatic activity name]* and indicate how often each of the following items occurred.

	Never	Rarely	Sometimes	Frequently	All the time
Shared ideas	<input type="radio"/>				
Sought feedback from	<input type="radio"/>				
Shared infrastructure	<input type="radio"/>				
Shared technology	<input type="radio"/>				
Shared expenses	<input type="radio"/>				
Shared personnel	<input type="radio"/>				
Shared <u>trade secrets</u>	<input type="radio"/>				

End of Block: Partner collaboration and interaction

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Start of Block: Programmatic activities data collection continued

Q24 Please indicate the status of *[insert programmatic activity name]*.

- Active
- On hold
- Cancelled
- Completed

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*Display This Question:*  
*If answer option "Cancelled" is selected in Q24*

Q25 Please provide a short explanation on why this activity has been cancelled.

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*Display This Question:*  
*If answer option "On hold" is selected in Q24*

Q26 Please provide a short explanation on why this activity is on hold.

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Q27 Please enter the amount of funding received to date from NSF Engines to support this activity.

Amount received (please round to the nearest dollar)

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Q28 Please enter the number of anticipated milestones associated with this activity that are within the first 24 months of award.

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End of Block: Programmatic activities data collection continued

Q29 through Q34 are displayed only if the text response in Q28 is greater than or equal to 1.

If text response in Q28 is 0, survey skips to Q35

Start of Block: Milestone entry loop

Questions 29 through 31 are repeated X number of times where X is the number of anticipated milestones entered in Q28.

Q29 Please provide a name for milestone [insert current loop number].

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Q30 Please provide a description of the milestone.

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Q31 Please provide the anticipated completion date of this milestone (mm/dd/yyyy).

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End of Block: Milestone entry loop

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Start of Block: Milestone status

Q32 Please indicate the status for each of the identified milestones associated with this activity.

	On track	At risk	Off track
[insert text response from Q29. The number of rows displayed is the number entered in Q28]	0	0	0

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Display This Question:

If the number of "At risk" selections is greater than or equal to 1

Q33 Please provide a short explanation on why *[selected milestones that are "At risk" in Q32]* is/are at risk.

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Display This Question:

If the number of "Off track" selections is greater than or equal to 1

Q34 Please provide a short explanation on why *[selected milestones that are "Off track" in Q32]* is/are off track.

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End of Block: Milestone status

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Start of Block: Clinical trials

Q35 If successful, please indicate whether this activity will result in a new medical device or drug (select all that apply).

- Yes, this activity will result in a new medical device
- Yes, this activity will result in a new drug
- No, this activity will not result in a new medical device or drug

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Display This Question:

*If answer option "Yes, this activity will result in a new medical device" is selected in Q35*

Q36 Please indicate whether the new medical device would be considered a class III medical device as defined by the Food and Drug Administration (FDA).

- Yes, it would be considered a class III medical device
- No, it would not be considered a class III medical device
- I do not know whether it would be considered a class III medical device

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Display This Question:

*If answer option "No, it would not be considered a class III medical device" is selected in Q36*

Q37 Please indicate to which class the new medical device would belong.

- Class I medical device
  - Class II medical device
  - I do not know to which class the new medical device would belong
-

Display This Question:

If answer option "Yes, this activity will result in a new drug" is selected in Q35

Q38 As of [insert current date], please indicate which of the following step in the drug development process this activity is in.

- Step 1. Discovery and development
  - Step 2. Preclinical research
  - Step 3.A Clinical research phase 1 clinical trials
  - Step 3.B Clinical research phase 2 clinical trials
  - Step 3.C Clinical research phase 3 clinical trials
  - Step 3.D Clinical research phase 4 clinical trials
  - Step 4. FDA review
  - Step 5. FDA post-market safety monitoring
- 

Display This Question:

If answer option "Yes, this activity will result in a new medical device" is selected in Q35

Q39 As of [insert current date], please indicate which of the following step in the device development process this activity is in.

- Step 1. Device discovery and concept
- Step 2. Preclinical research

- Step 3.A Clinical research phase 1 clinical trials
  - Step 3.B Clinical research phase 2 clinical trials
  - Step 3.C Clinical research phase 3 clinical trials
  - Step 3.D Clinical research phase 4 clinical trials
  - Step 4. FDA review
  - Step 5. FDA post-market safety monitoring
- 

Display This Question:

*If answer options "Step 3.A Clinical research phase 1 clinical trials,"  
"Step 3.B Clinical research phase 2 clinical trials,"  
"Step 3.C Clinical research phase 3 clinical trials,"  
"Step 3.D Clinical research phase 4 clinical trials,"  
"Step 3.A Clinical research phase 1 clinical trials,"  
"Step 3.B Clinical research phase 2 clinical trials,"  
"Step 3.C Clinical research phase 3 clinical trials," or  
"Step 3.D Clinical research phase 4 clinical trials" are selected in Q39*

Q40 Has the clinical trial study been registered on ClinicalTrials.gov?

- Yes, our clinical trial has been registered on ClinicalTrials.gov
  - No, our clinical trial has not been registered on ClinicalTrials.gov
  - I do not know if our clinical trial has been registered on ClinicalTrials.gov
- 

Display This Question:

*If answer option "Yes, our clinical trial has been registered on ClinicalTrials.gov" is selected in Q40*

Q41 Please provide the ClinicalTrials.gov identifier (NCT number) associated with your clinical trial.

NCT \_\_\_\_\_

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Display This Question:

If answer option "Yes, this activity will result in a new drug" is selected in Q35

Q42 Do you have additional information or comments regarding *[insert programmatic activity name]* that has not been captured in the previous questions?

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End of Block: Clinical trials

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Display Q43 if programmatic category from the intake: programmatic activities survey is "ecosystem building."

The survey ends after Q43 if the programmatic category is "ecosystem building."

Start of Block: Additional information and comments

Q43 Do you have additional information or comments regarding *[insert programmatic activity name]* that has not been captured in the previous questions?

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End of Block: Additional information and comments

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Q44 through Q50 are displayed only if the programmatic category from the intake: programmatic activities survey is "R&D or translation."

Start of Block: R&D and translation specific questions

Q44 Please indicate whether *[insert programmatic activity name]* has resulted in any invention disclosures.

- Yes, *[insert programmatic activity name]* has resulted in invention disclosures
- No, *[insert programmatic activity name]* has not resulted in any invention disclosures

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Display This Question:

If answer option "Yes, *[insert programmatic activity name]* has resulted in invention disclosures" is selected in Q44

Q45 Please indicate the number of invention disclosures that have resulted from *[insert programmatic activity name]*.

\_\_\_\_\_

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Display This Question:

If answer option "Yes, *[insert programmatic activity name]* has resulted in invention disclosures" is selected in Q44

Q46 Please provide the iEdison invention report number for each invention that was disclosed.

*X ranges between 1 and 10. The following form field is displayed X number of times where X is the number of invention disclosures entered in Q45.*

- iEdison invention report number X

\_\_\_\_\_

Q47 As of [insert current date], please indicate whether [insert programmatic activity name] has resulted in any intellectual property.

- Yes, [insert programmatic activity name] has resulted in intellectual property
- No, [insert programmatic activity name] has not resulted in any intellectual property
- 

Display This Question:

If answer option "Yes, [insert programmatic activity name] has resulted in intellectual property" is selected in Q47

Q48 Please indicate which of the following intellectual property have resulted from [insert programmatic activity name] in [insert current year] (select all that apply).

- Trademark(s)
- Copyright(s)
- Patent(s)
- Trade secret(s)
-

Display This Question:

If answer option "Yes, [insert programmatic activity name] has resulted in intellectual property" is selected in Q47

Q49 Please indicate the number of each of the following intellectual property that have been applied for or granted by the USPTO for [insert programmatic activity name] in [insert current year]. Please enter 0 if none applies.

Display This Choice:

If answer options "Trademark(s)" or "Copyright(s)" are selected in Q48

	Applied	Granted
Display This Choice: If answer option "Trademark(s)" is selected in Q48 Trademark(s)		
Display This Choice: If answer option "Copyright(s)" is selected in Q48 Copyright(s)		

Display This Question:

If answer option "Patent(s)" is selected in Q48

Q50 Please indicate how many patent applications have resulted from [insert programmatic activity name].

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End of Block: R&D and translation specific questions

Start of Block: Patent loop

Questions 51 through 59 are repeated X number of times where X is the number of patent applications entered in Q67.

Q51 For each patent application, please provide the following information.

You are entering information for patent application [insert current loop number].

Patent application number

\_\_\_\_\_

Patent title \_\_\_\_\_

Patent owner \_\_\_\_\_

Date of patent application filing (mm/dd/yyyy)

\_\_\_\_\_

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*Display This Question:*

*If text response for "Patent application number" is not empty in Q51*

Q52 Please indicate for which patent type was applied.

Utility patent

Design patent

Plant patent

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*Display This Question:*

*If answer option "Design patent" is selected in Q52*

Q53 Please indicate whether the design patent was for an industrial design.

Yes, the design patent was for an industrial design

No, the design patent was not for an industrial design

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Display This Question:

If patent application number free response is Not Empty in Q51

Q54 As of [insert current date], has this patent application been granted?

- Yes, this patent application has been granted
  - No, this patent application has not been granted
- 

Display This Question:

If answer option "Utility patent" is selected in Q52

Q55 Please select which of the following maintenance fees have been paid for [text response for "Patent title" in Q51], if any (select all that apply).

- Maintenance fee for 3.5 years
  - Maintenance fee for 7.5 years
  - Maintenance fee for 11.5 years
  - This patent has not come up for its first maintenance fee yet
-

Display This Question:

If answer option "Yes, this patent application has been granted" is selected in Q54

Q56 Has this patent been licensed?

- Yes, this patent has been licensed
- No, this patent has not been licensed

Display This Question:

If answer option "Yes, this patent has been licensed" is selected in Q56

Q57 To date, please indicate how many licensing agreements have been made for this patent.

\_\_\_\_\_

Display This Question:

If answer to Q57 Is Greater Than or Equal to 1

Q58 Please provide the following information for each licensing agreement. Enter "NA" if not applicable.

Display This Choice:

X will range between 1 and 10. The following form field options will be repeated X number of times where X is the number of licensing agreements indicated in Q57.

Total upfront payment received for licensing agreement X

\_\_\_\_\_

Licensee for agreement X \_\_\_\_\_

Duration of licensing agreement X

\_\_\_\_\_

To date, total amount of royalties realized from licensing agreement X

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Q59 Please indicate the number of start-up companies, if any, that have been created because of *[insert programmatic activity name]*. If no start-up companies have been created as a result of this activity, please enter 0.

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End of Block: Patent loop

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Start of Block: Startup loop

Questions 60 and 61 are repeated X number of times where X is the number of start-up companies entered in Q59.

Q60 Please provide the following information for each start-up company that was created as a result of *[insert programmatic activity name]*.

You are entering information for start-up company *[insert current loop number]*.

Name of start-up company

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Year that start-up was established (yyyy)

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Q61 Please provide the Employer Identification Number (EIN) associated with the start-up.

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End of Block: Startup loop

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Start of Block: TRL

Q62 The following questions will be used to assess the technology readiness level (TRL) of your activity.

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Q63 Please answer yes or no for the following questions regarding *[insert programmatic activity name]*.

	Yes	No
Do basic scientific principles support the concept of the project?	<input type="radio"/>	<input type="radio"/>
Has a scientific methodology or approach been developed?	<input type="radio"/>	<input type="radio"/>

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Display This Question:

If "Yes" was selected for all answer options in Q63

Q64 Please answer yes or no for the following questions regarding *[insert programmatic activity name]*.

	Yes	No
Are potential framework applications identified?	<input type="radio"/>	<input type="radio"/>
Has an apparent design solution been identified?	<input type="radio"/>	<input type="radio"/>
Have the basic components of the technology/product been identified?	<input type="radio"/>	<input type="radio"/>
Have technology or system components been at least partially characterized?	<input type="radio"/>	<input type="radio"/>
Have potential users been at least partly identified?	<input type="radio"/>	<input type="radio"/>
Do preliminary analyses or experiments confirm basic scientific principles?	<input type="radio"/>	<input type="radio"/>
Do preliminary analyses or experiments confirm that the application might meet user needs?	<input type="radio"/>	<input type="radio"/>

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Display This Question:

If "Yes" was selected for all answer options in Q64

Q65 Please answer yes or no for the following questions regarding *[insert programmatic activity name]*.

	Yes	No
Do experiments or modeling and simulation validate performance predictions of technology capability?	<input type="radio"/>	<input type="radio"/>
Are technology or system performance metrics established?	<input type="radio"/>	<input type="radio"/>
Has scientific feasibility of proposed technology been fully demonstrated?	<input type="radio"/>	<input type="radio"/>
Does the technology address a need, fill a capability gap, or introduce an innovation in the field?	<input type="radio"/>	<input type="radio"/>

Display This Question:

If "Yes" was selected for all answer options in Q65

Q66 Please answer yes or no for the following questions regarding *[insert programmatic activity name]*.

	Yes	No
Have end user technology/system requirements been documented?	<input type="radio"/>	<input type="radio"/>
Have performance characteristics been demonstrated in a laboratory environment?	<input type="radio"/>	<input type="radio"/>
Have low-fidelity assessments of system integration and engineering been completed?	<input type="radio"/>	<input type="radio"/>

Display This Question:

If "Yes" was selected for all answer options in Q66

Q67 Please answer yes or no for the following questions regarding *[insert programmatic activity name]*.

	Yes	No
Are target and minimum operational/functional requirements developed?	<input type="radio"/>	<input type="radio"/>
Can all system specifications be simulated and validated within a laboratory environment (i.e., fully controlled setting)?	<input type="radio"/>	<input type="radio"/>
Have objective and threshold operational requirements been developed?	<input type="radio"/>	<input type="radio"/>
Have internal system interface requirements been documented?	<input type="radio"/>	<input type="radio"/>
Has analysis of internal interface requirements been completed?	<input type="radio"/>	<input type="radio"/>

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Display This Question:

If "Yes" was selected for all answer options in Q67

Q68 Please answer yes or no for the following questions regarding *[insert programmatic activity name]*.

	Yes	No
Is the operational/functional environment fully known (i.e. user community, physical environment, and input data characteristics as appropriate)?	<input type="radio"/>	<input type="radio"/>
Has the prototype been tested in a realistic environment outside the laboratory (i.e., relevant environment)?	<input type="radio"/>	<input type="radio"/>
Does the prototype satisfy all operational/functional requirements when confronted with realistic problems?	<input type="radio"/>	<input type="radio"/>
Has engineering feasibility been fully demonstrated?	<input type="radio"/>	<input type="radio"/>

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Display This Question:

If "Yes" was selected for all answer options in Q68

Q69 Please answer yes or no for the following questions regarding *[insert programmatic activity name]*.

	Yes	No
Have all interfaces/components been tested individually under stressed and anomalous conditions?	<input type="radio"/>	<input type="radio"/>
Are all available components ready to be fully integrated in the final product?	<input type="radio"/>	<input type="radio"/>
Has the technology been tested in a relevant environment?	<input type="radio"/>	<input type="radio"/>
Has the the fully integrated product been demonstrated in an operational environment (i.e., real-world conditions, including the user community)?	<input type="radio"/>	<input type="radio"/>

Display This Question:

If "Yes" was selected for all answer options in Q69

Q70 Please answer yes or no for the following questions regarding *[insert programmatic activity name]*.

	Yes	No
Has technology/product form, fit, and function been demonstrated in an operational environment (i.e., meet target performance measures)?	<input type="radio"/>	<input type="radio"/>
Has a Developmental Test and Evaluation (DT&E) been successfully completed?	<input type="radio"/>	<input type="radio"/>
Does the technology/product meet its stated purpose and functionality as developed?	<input type="radio"/>	<input type="radio"/>

Display This Question:

If "Yes" was selected for all answer options in Q70

Q71 Please answer yes or no for the following questions regarding *[insert programmatic activity name]*.

	Yes	No
Has the technology/product been deployed in its intended operational environment?	<input type="radio"/>	<input type="radio"/>
Has the technology/product been fully demonstrated?	<input type="radio"/>	<input type="radio"/>
Has information about the technology/product been disseminated to the user community?	<input type="radio"/>	<input type="radio"/>
Has Operational Test and Evaluation (OT&E) been successfully completed?	<input type="radio"/>	<input type="radio"/>

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Display This Question:

If "Yes" was selected for all answer options in Q71

Q72 Please indicate if the product from *[insert programmatic activity name]* has entered the market.

- Yes, the product has entered the market
- No, the product has not entered the market

End of Block: TRL

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Start of Block: ARL

Q73 The following questions will be used to assess the adoption readiness level (ARL) of your activity. Please assume (1) the current policy environment with no changes and (2) a 3-5 year timeframe when answering the following questions. You can find out more about the ARL framework [here](#).

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Q74 Please select the level of risk associated with achieving delivered cost competitiveness when produced at full scale, including amortization of incurred development and capital costs, and accounting for switching costs (if any).

**Low:** the technology solution is either (a) currently more cost effective than the incumbent or competing technology, or (b) close to cost-parity and on a clear cost curve to achieve cost-parity within 3 years; and fundamental cost components (e.g., cost of critical inputs) are not at risk of significant market swings.

**Medium:** the technology solution is more than 3 years away from achieving cost-parity with incumbent or competing technology but is on a clear path to be more cost effective; and/or there are some fundamental cost components that are at risk of market swings.

**High:** the technology solution is more expensive than the incumbent or competing technology and there is no clear pathway to cost competitiveness without substantial additional R&D advances.

NA

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Q75 Please select the risk level associated with the ability of the technology solution to meet or exceed the performance and feature-set of incumbent solutions or create new end-use markets.

**Low:** the technology solution provides sustained improved performance and/or benefits that justify a premium (if any) in an existing end-use case or value in a new end-use case.

**Medium:** the technology solution provides equivalent functionality to existing products (i.e., same performance on all key parameters), or improved performance does not justify current premium, or performance differential will not be sufficiently sustained (e.g., lack of fundamental competitive advantage or weak IP protection allows incumbent or competitors to reduce differential quickly).

**High:** the technology solution provides poorer functionality than existing solutions currently in place.

NA

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Q76 Please select the risk level associated with operational switching costs; the ability of a new user (individual, company, system integrator) to adopt and operationalize the technology with limited training, few new requirements, or special resources (e.g., tools, workforce, contract structures).

**Low:** the technology solution is easy to use / operate & maintain by the typical user/operator (e.g., highly intuitive with little need for additional training or similar to existing systems) and is plug-and-play with current infrastructure/equipment.

**Medium:** the technology solution can be operated & maintained by a typical user/operator after some training and allows for interoperability with existing infrastructure/equipment with minor adjustments.

**High:** the technology solution deployment requires extensive operations and maintenance training of personnel and/or there are meaningful integration costs to successfully use/integrate the product.

NA

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Q77 Please select the risk level associated with demand certainty and access to standardized sales & contracting mechanisms (if required), as well with natural (e.g., network effects, first-mover-advantages) and / or structural (e.g., existing monopolies / oligopolies) barriers to entry in the market(s) to which the technology solution can be applied.

**Low:** there is a clear pathway for the technology solution to be introduced in a target market and gain initial traction; and there is standardized off-take (e.g., long-term agreements, hedge-able commodity market, accessible consumer market).

**Medium:** the technology solution would need to overcome substantial barriers to entry from competing technologies to enter the market but has clear pathway to do so; and there is a developing standardization of off- take.

**High:** the technology solution's ability to enter the market is limited due to incumbent advantages and market barriers to entry; or off-take is not easy / standardized and does not meet the needs of technology solution deployment.

NA

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Q78 Please select the risk level associated with the overall size of the market that can be served by the technology, and the level of uncertainty with which it will materialize.

**Low:** the technology solution is well positioned to compete strongly in a large and existing market or dominate market share in a small and existing market; technology solution can be broadly adopted across geographies.

**Medium:** the technology solution addresses only a moderately sized existing market opportunity, and / or there is moderate uncertainty to whether the market will materialize; technology solution may be limited to select markets because of geographic or other constraints.

**High:** the technology solution is limited to small markets, and / or relies on a market that has yet to materialize.

NA

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Q79 Please select the risk level associated with the projected path to get the product from a producer to a customer along the value chain (e.g., considering split incentives, technology acceptance, business model changes).

**Low:** the path to market is clear; business proposition and technology solution features work within existing incentives / business models, or newly aligns incentives for stakeholders along the value chain.

**Medium:** the path to market requires realigning of value chain; business model and technology acceptance level are not clear for one or more participants in current value chain.

**High:** Value chain is non-existent, highly fragmented, and / or technology solution benefits do not accrue to critical decision makers / gate keepers across value chain.

NA

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Q80 Please select the risk level associated with the availability of capital needed to move the technology solution from its current state to production at scale, including total investment required, availability of willing investors, availability of associated financial & insurance products, and the speed of capital flow.

**Low:** institutional investors confirm return profile in this technology solution is commercially competitive with their broader portfolio. Deal flow / risk profile is sufficient to develop regular equity & debt approval processes at relevant investment institutions & ratings agencies. Major risks are insurable.

**Medium:** there exist one or more “valleys of death” along the required capital stack to full deployment, but hurdles can be overcome, and capital flow & financial and insurance availability is beginning to increase.

**High:** significant additional investment from sources of concessionary / patient / high risk pools of capital (e.g., public sector, philanthropic, and catalytic venture capital) required to achieve deployment.

NA

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Q81 Please select the risk level associated with the existence of processes and capabilities to successfully and repeatably execute projects using the technology solution.

**Low:** mature processes and capabilities exist (e.g., within EPC contractors) to develop, integrate, and manage full projects using the technology solution; demonstrated by a track record of on-budget, on-time projects using the technology solution or comparable projects.

**Medium:** some processes and capabilities exist to develop, integrate, and manage full projects using the technology solution; but these are as-yet unproven.

**High:** Deployment of the technology solution requires building new or significantly improved project development, integration, and management processes and capabilities as compared with the industry status quo; demonstrations and deployments at scale face substantial budget and timeline risks as a result.

NA

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Q82 Please select the risk level associated with the physical and digital large-scale systems that need to be in place to support, enable, or facilitate deployment at full scale (e.g., pipelines, transmission lines, roads and bridges, etc.).

**Low:** the technology solution can be broadly deployed within existing large-scale physical and digital infrastructure.

**Medium:** the technology solution can be broadly deployed with minimal investment in large-scale infrastructure (i.e., existing infrastructure can be adapted to use with new technology solution) or there exists a clear and economic pathway for investors & developers to build required infrastructure.

**High:** the technology solution can be broadly deployed only with additional significant investments in new large-scale infrastructure and pathway to required infrastructure remains unclear.

NA

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Q83 Please select the risk level associated with all the entities & processes that will produce the end-product, including integrators, component, and sub-component manufacturers & providers.

**Low:** the technology solution deployment relies on off-the-shelf or simple adaptation of existing supply base products & existing manufacturing capabilities.

**Medium:** the technology solution deployment requires new components or products that are aligned with existing supply base capabilities but that may require minor upgrades or retooling of manufacturing and other processes.

**High:** the technology solution deployment requires creation of new manufacturing processes or supply chain components that are not currently in place, or deployment will overwhelm existing supply chain capacities.

NA

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Q82 Please select the risk level associated with the availability of critical materials required by the technology (e.g., rare earth and other limited availability materials).

- Low:** the technology solution relies on materials that are readily available in a competitive and distributed market and can be procured off the shelf with little to no geopolitical risk.
  - Medium:** the technology solution relies on materials that are abundantly available but may face some risks (e.g., rely on new processing methods to make suitable for the application, geographic concentration).
  - High:** the technology solution relies on materials that are limited in supply relative to the needed demand, may be difficult to obtain, may face geopolitical risks, or are very costly to produce in the needed quantities.
  - NA
- 

Q85 Please select the risk level associated with the human capital and capabilities required to design, produce, install, maintain, and operate the technology solution at scale.

- Low:** existing workforce has the necessary skills to manufacture and deploy technology solution with little additional training or significant scale-up.
  - Medium:** existing workforce requires additional training to either manufacture or deploy/install technology solution and pipelines exist to provide workforce training, but may need to be scaled.
  - High:** Workforce is nearly non-existent, significant training is required for initial technology solution introduction and scale-up.
  - NA
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Q86 Please select the risk level associated with local, state, and federal regulations or other requirements / standards that must be met to deploy the technology at scale.

**Low:** the technology solution can be broadly deployed within existing regulatory framework and standards, and those frameworks and standards are applied in a well-understood and fast-moving process with minimal risk of delays.

**Medium:** the technology solution can be broadly deployed with minor changes to regulations and standards, and / or regulatory hurdles are well- understood but time-consuming and at risk of delays.

**High:** Technology solution can be broadly deployed only with major changes to regulations and standards or entirely new regulations and standards; or significant challenges exist to navigate existing regulations and standards.

NA

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Q87 Please select the risk level associated with local, state, and federal government policy actions that support or hinder the adoption of the technology at scale.

**Low:** Technology solution requires little in the way of additional policy intervention to encourage adoption as a preferred solution; policymakers well aligned with any changes needed to encourage adoption.

**Medium:** the technology solution requires moderate policy intervention to achieve broad deployment and is well aligned with current governmental policy positions.

**High:** the technology solution requires significant policy intervention to achieve and / or sustain broad deployment; and / or policy makers are not aligned with implementing required intervention to encourage adoption.

NA

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Q88 Please select the risk level associated with the process to secure approvals to site and build equipment & infrastructure associated with deploying the technology at scale.

- Low:** permitting and siting process is easy, well-understood, timely, and repeatable.
  - Medium:** permitting and siting can be time-consuming, but jurisdiction is clear, and complexity is low. Speed can be achieved with repetition.
  - High:** Permitting and siting is highly complex and time-consuming, with multiple overlapping jurisdictions in play.
  - NA
- 

Q89 Please select the risk level associated with the potential for hazardous side effects or adverse events inherent to the production, transport, or use of the technology solution or end product in the absence of sufficient controls.

- Low:** the technology solution has minimal inherent environmental or safety risk; results in net zero carbon or negative carbon solution.
  - Medium:** the technology solution has potential for environmental degradation and /or safety concerns, but the risks can be managed through current processes and / or anticipated future processes or solutions.
  - High:** the technology solution has potential to create significant environmental degradation or increases carbon emissions over currently fielded solutions, and / or poses significant safety concerns that are challenging to mitigate.
  - NA
-

Q90 Please select the risk level associated with the general perception by global and local communities of the technology solution and its risks or impact, whether founded or unfounded.

**Low:** the technology solution is likely to be positively received by the public with a strong level of support.

**Medium:** the technology solution may create pockets of public resistance but no systemic challenges are anticipated, and local communities are aligned with deployment in key deployment locations.

**High:** Technology solution is likely to generate negative public or community reactions that could derail or significantly delay deployment.

NA

End of Block: ARL

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*Q91 through Q96 if the programmatic category from the intake: programmatic activities survey is "workforce development."*

Start of Block: WFD specific questions

Q91 Please indicate the targeted educational group(s), if any, of this workforce development activity (select all that apply).

- Elementary school students
  - Middle school students
  - High school students
  - Community college students
  - 4-year undergraduate students
  - Master's level students
  - PhD students
  - Postdoctoral researchers
  - Technical degree seeking students
  - Credential seeking students
  - Non-traditional students (e.g., already in the workforce)
  - Other (please specify) \_\_\_\_\_
  - This activity does not target any specific educational group
-

Q92 Please indicate the targeted racial or ethnic group(s), if any, of this workforce development activity (select all that apply).

African Americans

Asian Americans

American Indians and Alaska Natives

Hispanics (or Latinos)

Native Hawaiians and other Pacific Islanders

Other (please specify) \_\_\_\_\_

This activity does not target any specific racial or ethnic group

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Q93 Please indicate the targeted underrepresented group(s), if any, of this workforce development activity (select all that apply).

- Women
  - Individuals with low socioeconomic status
  - Individuals with disabilities
  - Unemployed individuals
  - Veterans
  - Individuals without a college degree
  - Other (please specify) \_\_\_\_\_
  - This activity does not target any specific underrepresented group
- 

Q94 Please indicate the length of time participants are engaged in this activity.

- Less than 1 month
- 1-2 months
- 3-6 months
- 7-12 months
- 13-24 months
- 25-36 months
- 37+ months

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Q95 Please indicate whether participants of this workforce development activity receive or can apply for any of the following credentials upon completion of *[insert programmatic activity name]* (select all that apply).

A certification

A license

An educational certificate

An academic degree

A certificate

Participants completing this program will not receive any of the above credentials

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Q96 As of *[insert current date]*, please indicate the total number of individuals who have participated and completed *[insert programmatic activity name]*.

Number of participants \_\_\_\_\_

Number of completions \_\_\_\_\_

End of Block: WFD specific questions

