Innovation Network for Fusion Energy

A new initiative for accelerate the private development of fusion energy

INFUSE | Innovation Network for Fusion Energy

D. Youchison, A. Diallo

June 26, 2019

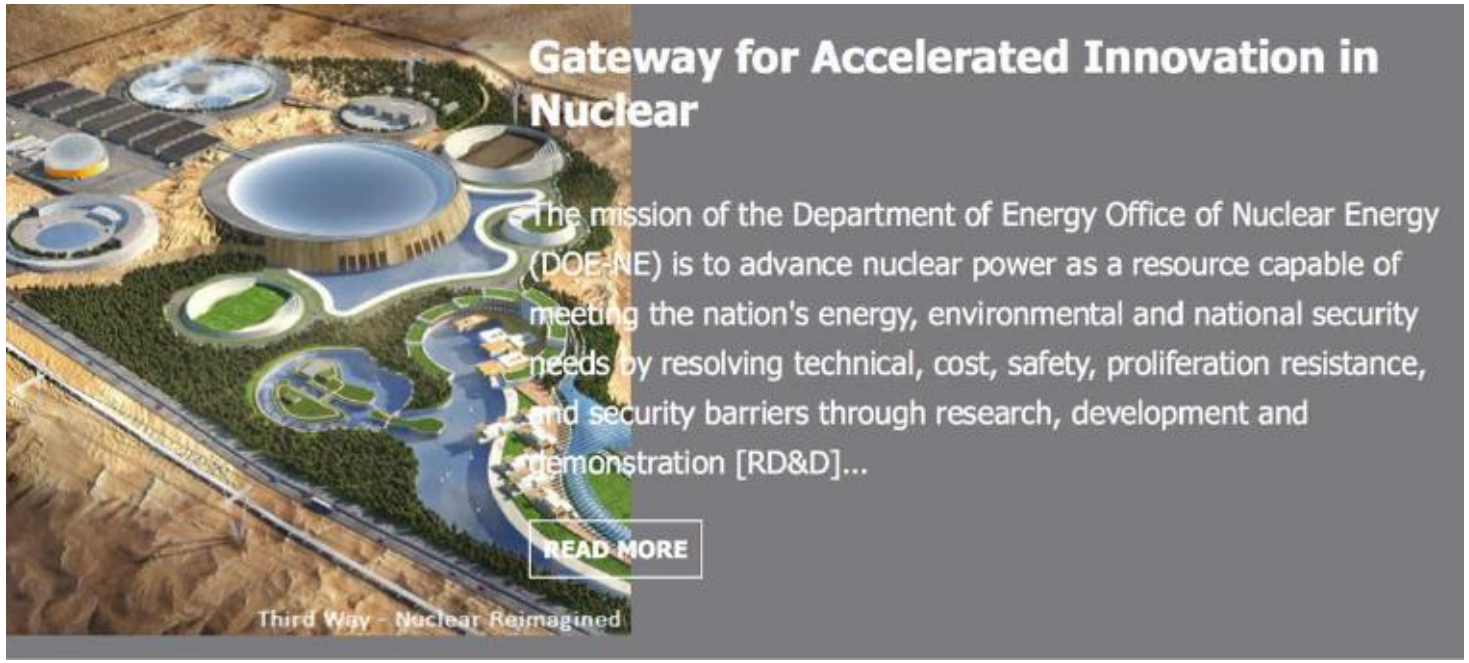
U.S. DEPARTMENT OF ENERGY

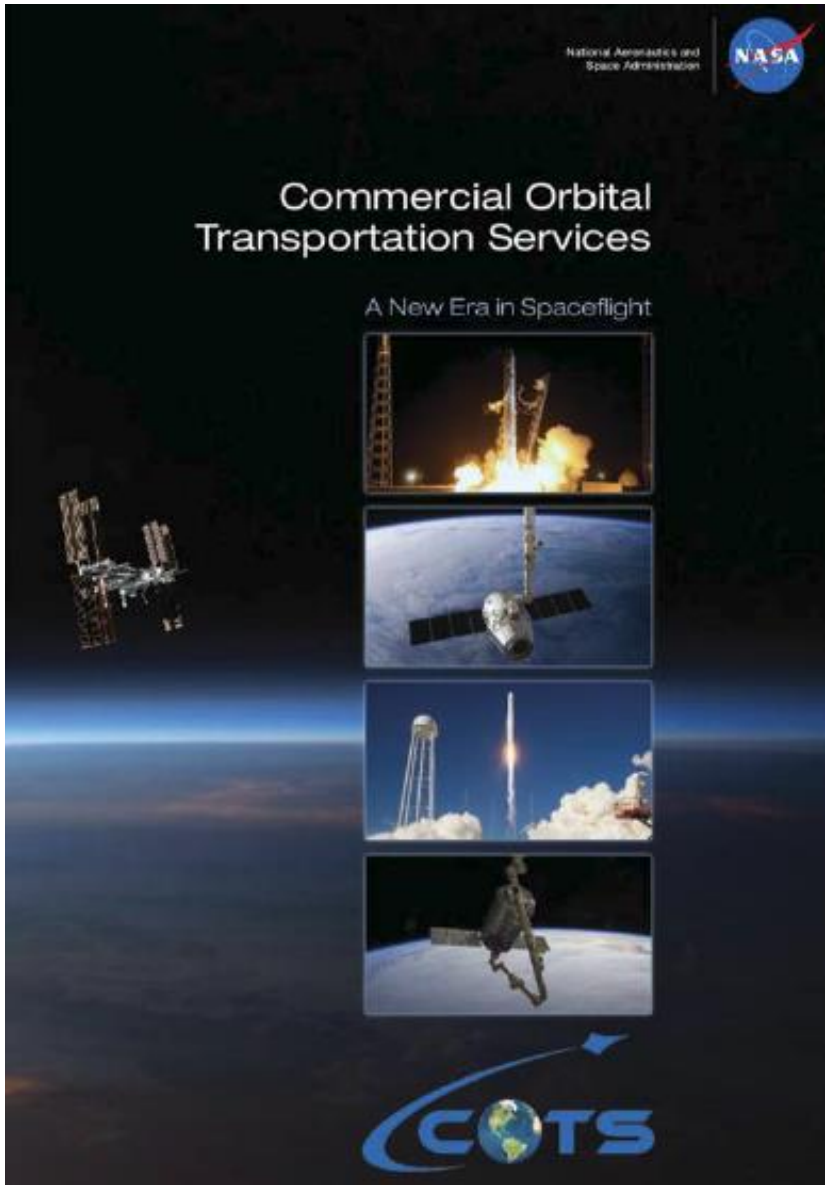
Outline

- Introduction to INFUSE, a new SC-FES program
- Private company qualifications
- Awards for the pilot program
- Proposal cycle and schedule
- Participating DOE laboratories
- Proposal requirements
- Review criteria
- INFUSE website – submission process
- Summary

Private/Public Partnerships: the Federal P3 initiatives

- DOE NE GAIN program
- ARPA-e program
- DOE FES INFUSE program
- NASA – Tipping Point program
- DOT FAST - infrastructure
- DoD – LMR, P3 USAR, hundreds more





INFUSE Innovation Network for Fusion Energy

- FES establishes INFUSE program to aid private/public partnerships in Fusion
- ORNL and PPPL selected to manage INFUSE program for FES
- ORNL has launched a new INFUSE website for submissions and reviews
- Formal DOE launch announcement occurred June 04
- FY2019 RFA and initial proposal submissions during June, due July 07
- FY2019 award selections funded in September

Participating laboratories: PPPL, ORNL, PNNL, INL, BNL, LBNL, LANL, LLNL

Topical areas:
Enabling Technologies including magnets
Materials Science
Plasma Diagnostics
Theory and Simulation
Magnetic Fusion Experimental Capabilities

Dennis Youchison-ORNL, INFUSE Director

OAK RIDGE National Laboratory

Ahmed Diallo-PPPL INFUSE Deputy Director

PPPL PRINCETON PLASMA PHYSICS LABORATORY

Company Qualifications

Company Certifications - Must be majority-owned U.S. Company. Requestors must certify that they will accept one of the standardized Cooperative Research and Development Agreements (CRADAs) available on the web site, and they will provide the required 20 percent or more cost-share upon selection for a partnership award.

Eligible Types of Assistance - Assistance can provide access to unique capabilities and facilities within the DOE complex. Partnership awards cannot be used to obtain a service or use equipment that is available in the private sector.

FY2019 is a **pilot** program
Will continue in FY2020 based on response

Awards

Funding: FES partnership awards provide funding to a laboratory within the DOE complex in order to help eligible private-sector companies overcome critical scientific and technological challenges in the pursuit of fusion energy. DOE anticipates making as many as 10 awards under this pilot program, each with value of approximately $50K - $200K. In all cases, a 20 percent cost share is required, calculated based on the full project cost (where the full project cost is defined as the sum of the government share and the partnership award recipient share).

Period of Performance: Award activities be completed within 12 months from the date the CRADA is executed.

Topical Areas for the FY2019 Solicitation

Topical Area	Lead Laboratory	Participating Laboratories
Enabling Technologies, including magnets	ORNL	PPPL, BNL, LBNL
Materials Science	ORNL	PNNL, INL
Plasma Diagnostics	PPPL	ORNL
Theory & Simulation	PPPL	ORNL, LANL, LLNL
Magnetic Fusion Experimental Capabilities	PPPL	ORNL, BNL, INL, LANL, LBNL, LLNL, PNNL

These areas may broaden or narrow as needed in future solicitations. Applications should focus on basic research in order to be within the Congressionally authorized mission space of FES. Applications focused on commercialization aspects of fusion energy will not be considered.

Need help? "Who you gonna call?"

Laboratory Points of Contact

(contact info on protected sharepoint site)

Brookhaven National Laboratory (BNL)	Ramesh Gupta
Idaho National Laboratory (INL)	Brad Merrill
Lawrence Livermore National Laboratory (LLNL)	Tom Rognlien
Lawrence Berkeley National Laboratory (LBNL)	Steve Gouray
Los Alamos National Laboratory (LANL)	Glen Wurden
Oak Ridge National Laboratory (ORNL)	Dennis Youchison
Pacific Northwest National Laboratory (PNNL)	Rick Kurtz
Princeton Plasma Physics Laboratory (PPPL)	Ahmed Diallo

Proposal Requirements

Section I: Technical Merit

1. Company Summary: Describe the mission and vision for your company. What differentiates your company from others in this field?
2. Problem Statement: Describe the challenge your company is facing and how this assistance, if granted, will help you overcome that challenge.
3. Work Scope: Describe the national laboratory or partner facility capability you need and the work you would like to be completed.
4. Fusion Energy Impact: Describe how this project, if successful, will contribute to advancing fusion energy development.

Section II: Impact

1. Use of Project Results: Describe how the results of the proposed research assistance will be used to advance the development of your company's fusion concept(s).

Section III. Qualifications & Experience

List the key members of your company's leadership and technical team. Briefly describe the qualifications and experience of the members who will be directly involved in the proposed activity. (Respondents may include up to three resumes).

Limited to 10 pages
Up to 3 two-page resume's

MERIT review criteria similar to other FES programs.

- 8-member lab POC panel
- 3 SME reviewers per proposal
- FES makes final award decisions

Request for Assistance applications will be evaluated in accordance with the following criteria:

1. SCIENTIFIC AND/OR TECHNICAL MERIT OF THE PROPOSED RESEARCH

- Has the applicant clearly identified a problem or challenge faced by the company that can be overcome by assistance from the host DOE laboratory?
- What is the likelihood of achieving valuable results?
- Does the proposed research have the potential to accelerate progress toward the development of fusion energy?

2. APPROPRIATENESS OF THE PROPOSED METHOD OR APPROACH

- Is the applicant's approach realistic and feasible with respect to scientific and technical considerations?
- Is the applicant's approach appropriately aligned with the host laboratory's capabilities?
- Does the applicant recognize significant potential problems and consider alternative strategies?

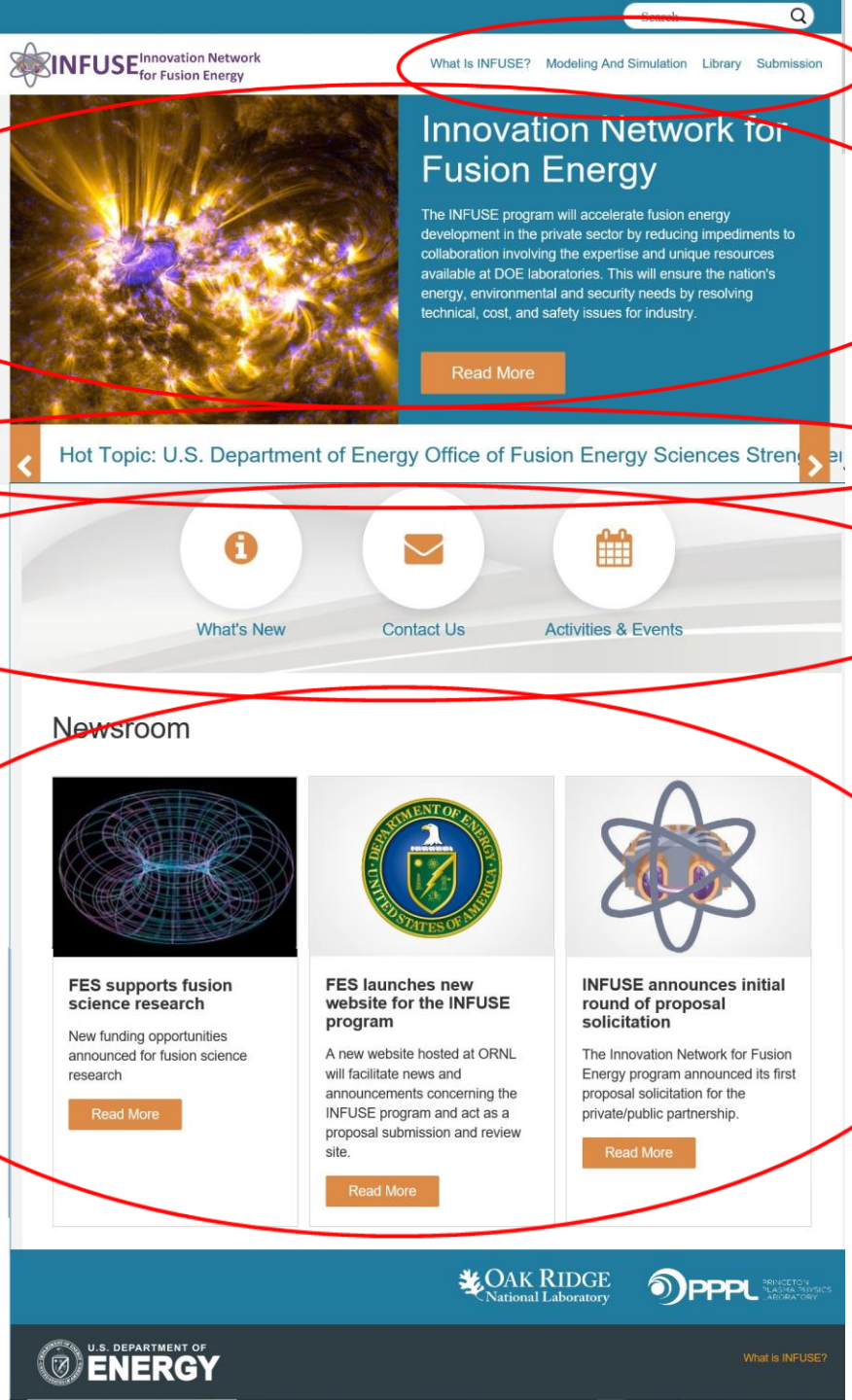
3. COMPETENCY OF APPLICANT'S PERSONNEL AND ADEQUACY OF PROPOSED RESOURCES

- What is the past performance and potential of the company and laboratory Principal Investigators (PI)?
- How well qualified is the research team at the host laboratory to carry out the proposed research?
- Are the research environment and facilities available to the designated host laboratory adequate for performing the research?
- Does the proposed work take advantage of unique facilities and capabilities of the host laboratory?

4. REASONABLENESS AND APPROPRIATENESS OF THE PROPOSED BUDGET

- Are the proposed budget and staffing levels adequate to carry out the proposed research?
- Is the budget reasonable and appropriate for the scope?

Public Website



menu

https://infuse.ornl.gov

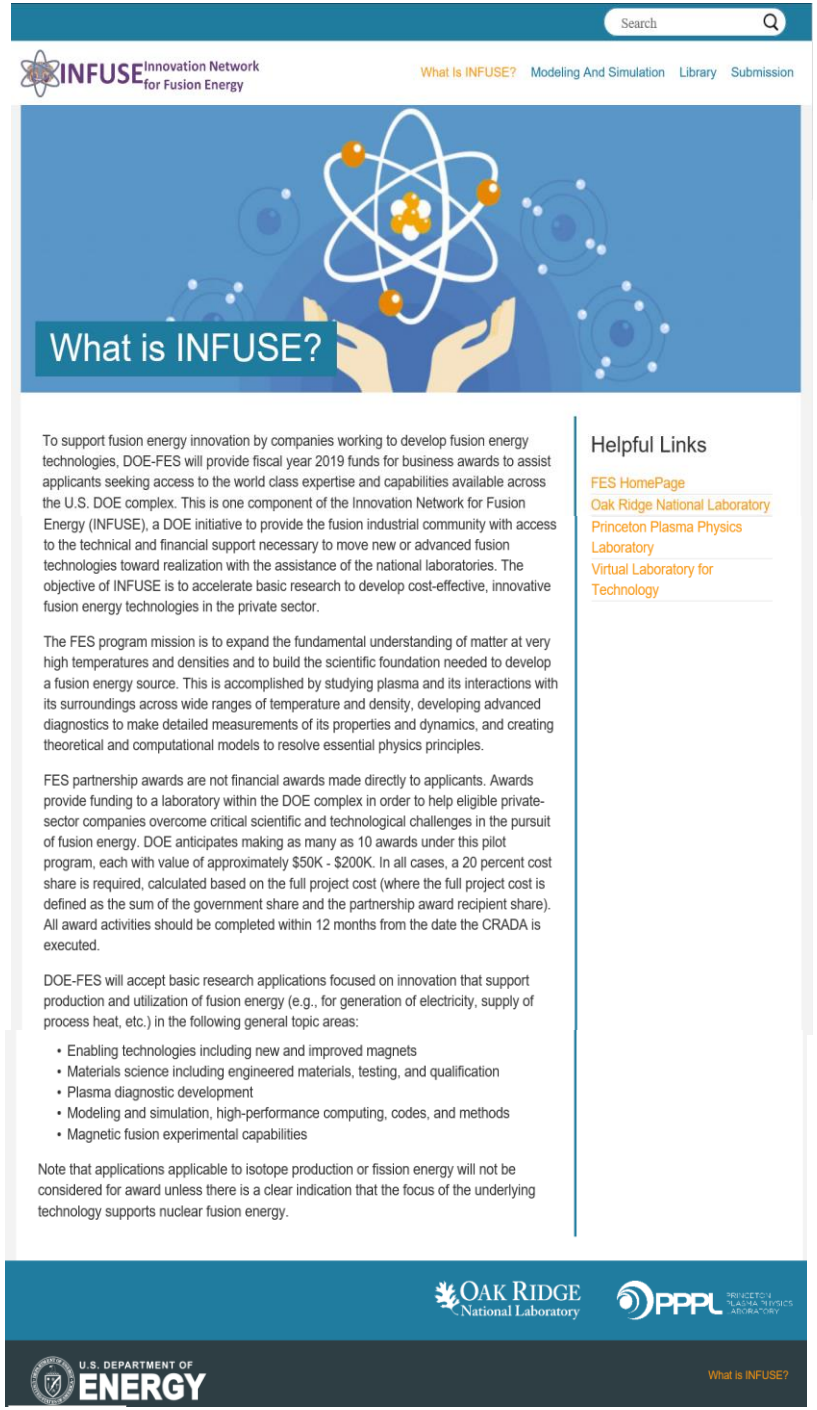
description

topic ticker

contact & calendar

news items

Info on latest solicitation and schedule

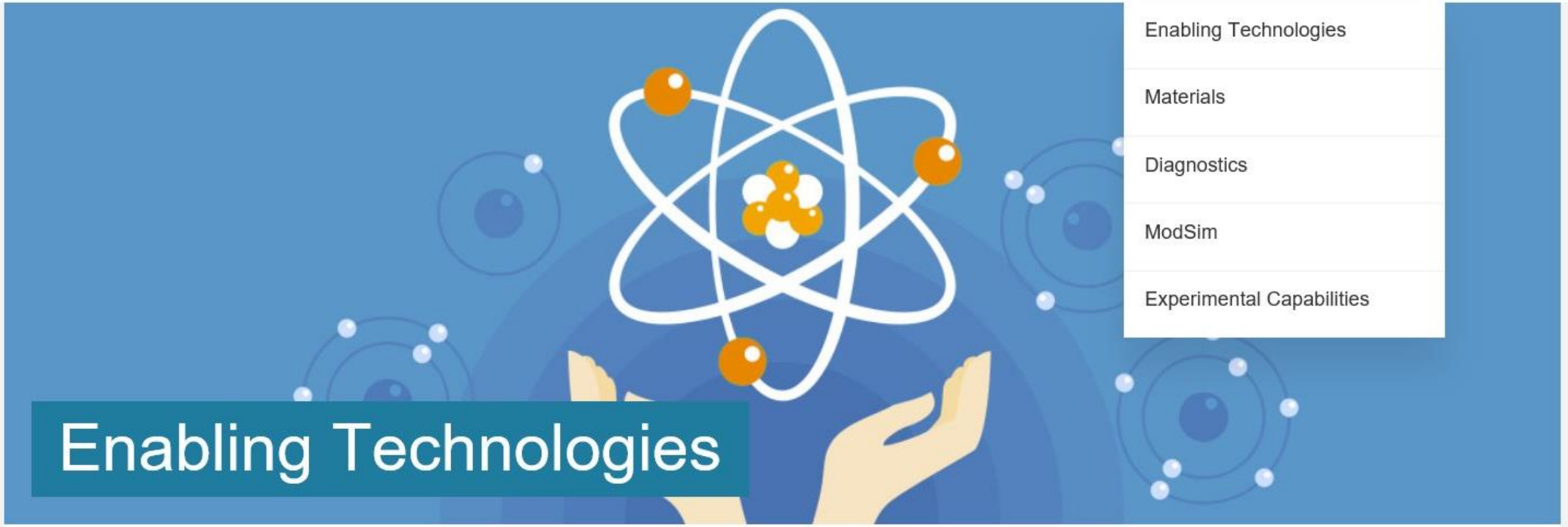

Search
INFUSE Innovation Network for Fusion Energy
What Is INFUSE?
Modeling And Simulation
Library
Submission
What is INFUSE?
To support fusion energy innovation by companies working to develop fusion energy technologies, DOE-FES will provide fiscal year 2019 funds for business awards to assist applicants seeking access to the world class expertise and capabilities available across the U.S. DOE complex. This is one component of the Innovation Network for Fusion Energy (INFUSE), a DOE initiative to provide the fusion industrial community with access to the technical and financial support necessary to move new or advanced fusion technologies toward realization with the assistance of the national laboratories. The objective of INFUSE is to accelerate basic research to develop cost-effective, innovative fusion energy technologies in the private sector.
The FES program mission is to expand the fundamental understanding of matter at very high temperatures and densities and to build the scientific foundation needed to develop a fusion energy source. This is accomplished by studying plasma and its interactions with its surroundings across wide ranges of temperature and density, developing advanced diagnostics to make detailed measurements of its properties and dynamics, and creating theoretical and computational models to resolve essential physics principles.
FES partnership awards are not financial awards made directly to applicants. Awards provide funding to a laboratory within the DOE complex in order to help eligible private-sector companies overcome critical scientific and technological challenges in the pursuit of fusion energy. DOE anticipates making as many as 10 awards under this pilot program, each with value of approximately $50K - $200K. In all cases, a 20 percent cost share is required, calculated based on the full project cost (where the full project cost is defined as the sum of the government share and the partnership award recipient share). All award activities should be completed within 12 months from the date the CRADA is executed.
DOE-FES will accept basic research applications focused on innovation that support production and utilization of fusion energy (e.g., for generation of electricity, supply of process heat, etc.) in the following general topic areas:
• Enabling technologies including new and improved magnets
• Materials science including engineered materials, testing, and qualification
• Plasma diagnostic development
• Modeling and simulation, high-performance computing, codes, and methods
• Magnetic fusion experimental capabilities
Note that applications applicable to isotope production or fission energy will not be considered for award unless there is a clear indication that the focus of the underlying technology supports nuclear fusion energy.
Helpful Links
FES HomePage
Oak Ridge National Laboratory
Princeton Plasma Physics Laboratory
Virtual Laboratory for Technology
OAK RIDGE National Laboratory
PPPL PRINCETON PLASMA PHYSICS LABORATORY
U.S. DEPARTMENT OF ENERGY
What is INFUSE?


Search
INFUSE Innovation Network for Fusion Energy
What Is INFUSE?
Modeling And Simulation
Library
Submission
Library
FESAC Transformative Enabling Capabilities report https://www.osti.gov/servlets/purl/1503999
FESAC NAS Burning Plasma Research report http://brookhaventech.com/wp-content/uploads/2018/12/Burning-Plasma-Fusion-Plan.pdf
FES Plasma Materials Interaction Reviewhttps://science.osti.gov/-/media/fes/pdf/workshop-reports/2016/PMI_fullreport_21Aug2015.pdf?la=en&hash=E9DEAB7D7651B8138DC4D74447BE859E29C5C0C0
FES Transients Review https://science.energy.gov/~/media/fes/pdf/program-news/Transients_Report.pdf
FES Integrated Simulations https://science.osti.gov/-/media/fes/pdf/workshop-reports/2016/ISFusionWorkshopReport_11-12-2015.pdf?la=en&hash=1432311A0F2EAD8CCF2375C76A9366BE1A96019C
ReNeW https://science.osti.gov/-/media/fes/pdf/workshop-reports/Res_needs_mag_fusion_report_june_2009.pdf
Helpful Links
FES HomePage
Oak Ridge National Laboratory
Princeton Plasma Physics Laboratory
Virtual Laboratory for Technology
OAK RIDGE National Laboratory
PPPL PRINCETON PLASMA PHYSICS LABORATORY
U.S. DEPARTMENT OF ENERGY
What is INFUSE?

INFUSE Innovation Network for Fusion Energy

What Is INFUSE? Topic Areas Library Submission

- Enabling Technologies
- Materials
- Diagnostics
- ModSim
- Experimental Capabilities



Enabling Technologies

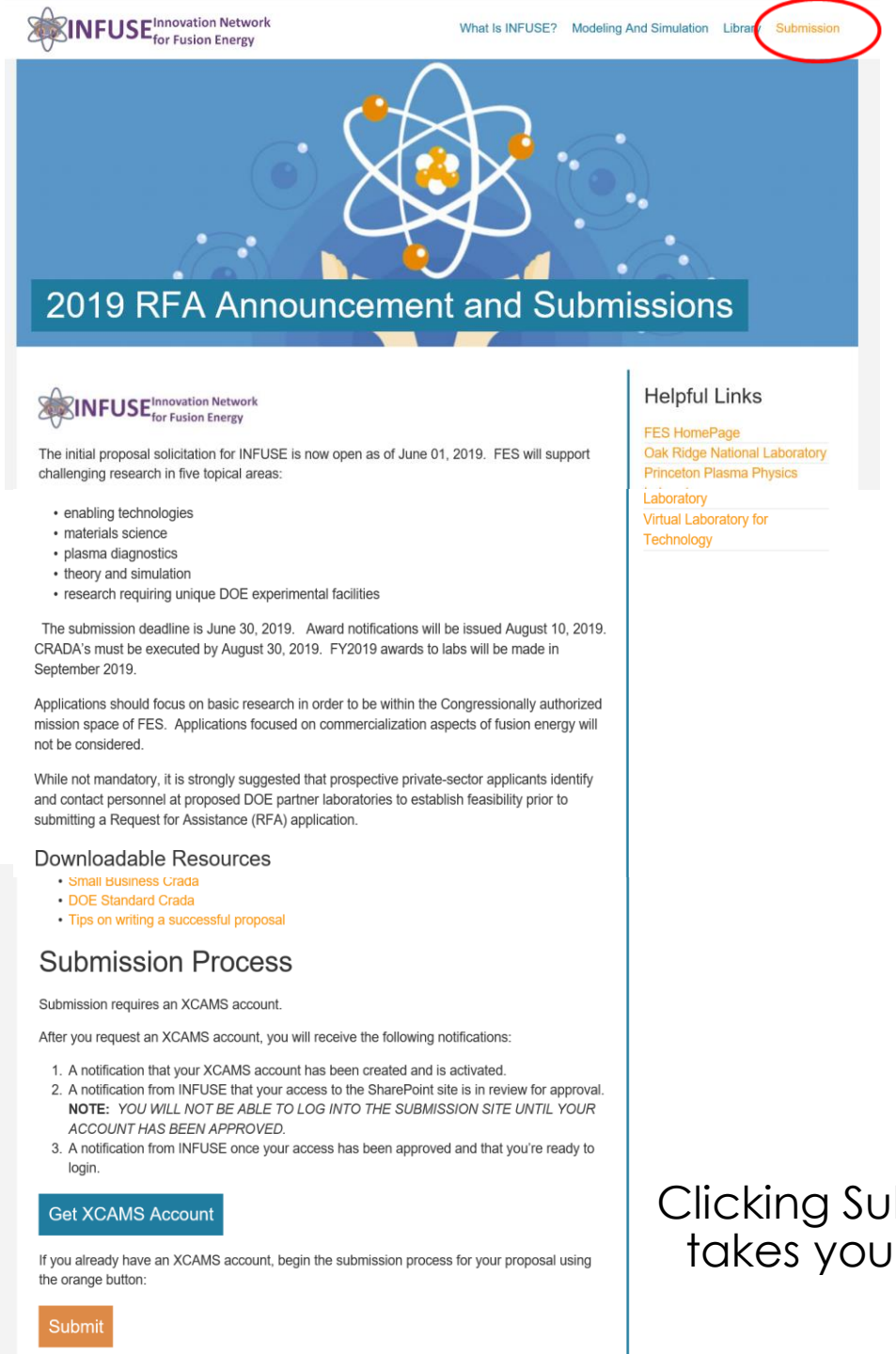
Enabling technologies include such things as:

- Magnets and magnet materials for LTSC, HTSC including HFSC
- RF heating systems including ICH, ECH, LHCD, helicon and gyrotron sources

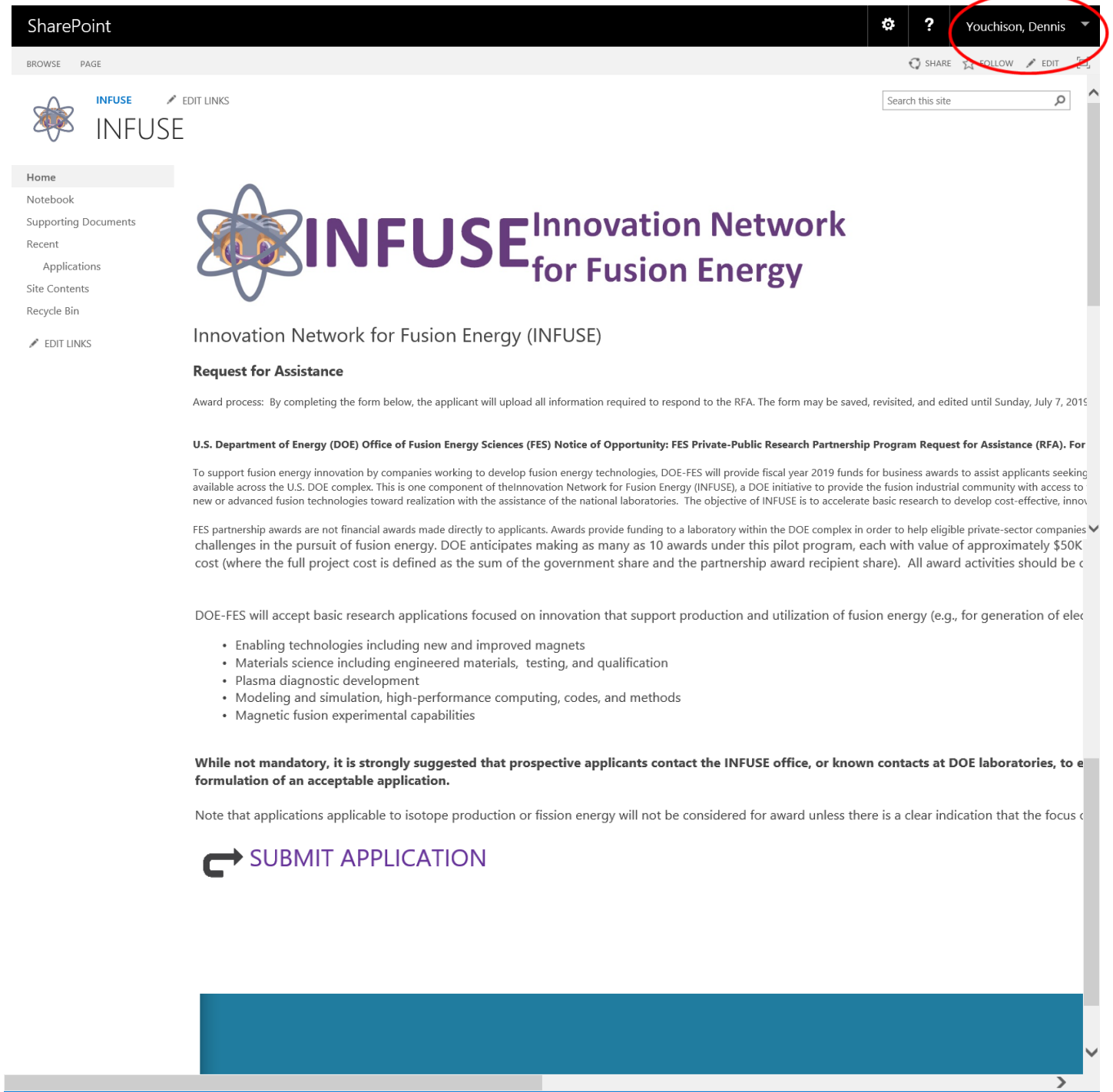
Helpful Links

FES HomePage

Oak Ridge National Laboratory



Clicking Submit from the public internet site takes you to a protected sharepoint site.

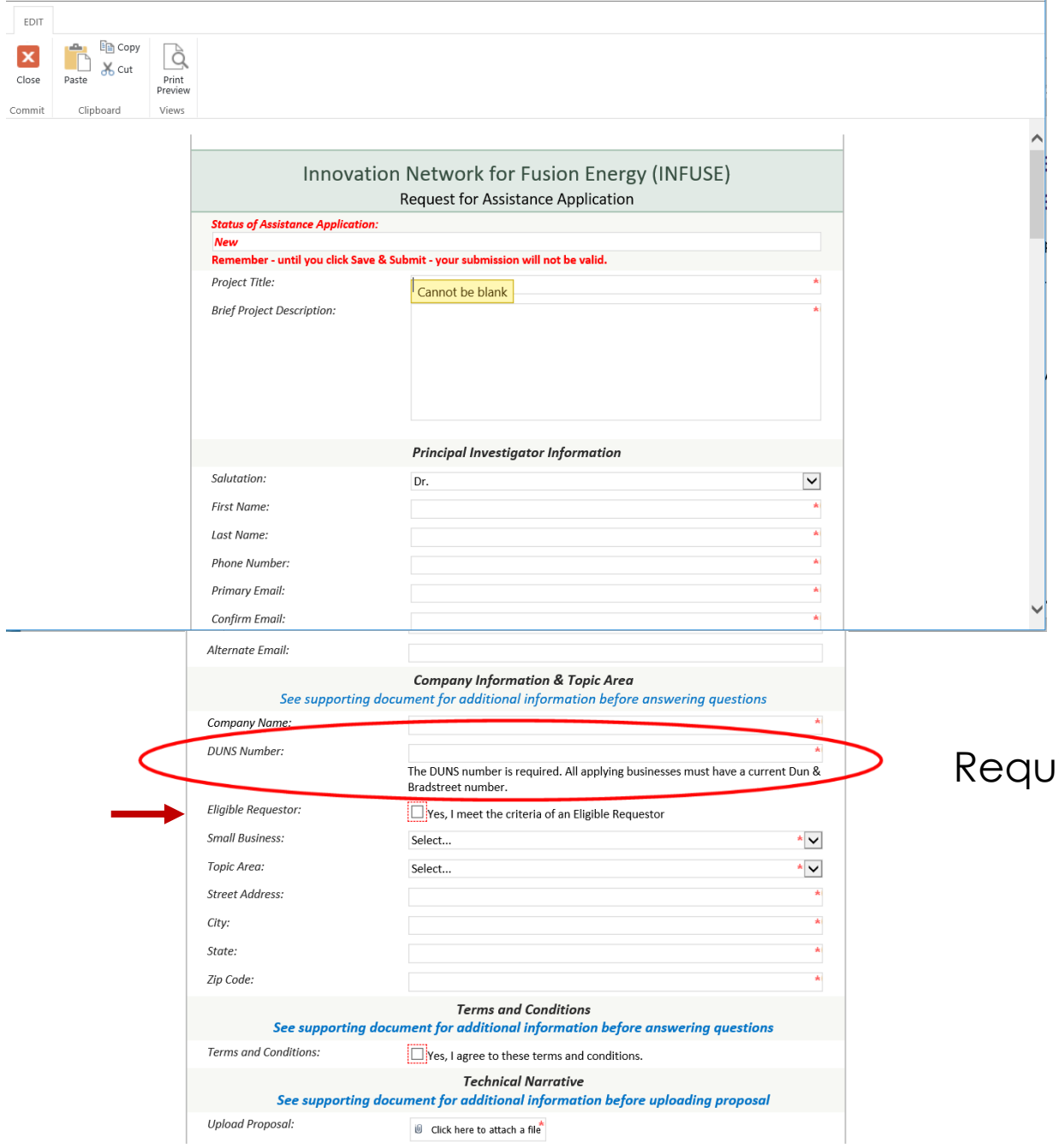


Proposals & Reviews are performed on a protected Sharepoint site with access control

Limit: one proposal per topical area

Submitters can only see their own proposals

Users can submit, edit and track their proposals until the final submission deadline



Requires a U.S. DUNS number
(Dun & Bradstreet)

Cost Share Estimate

See supporting document for additional information before answering questions

Estimated Total Project Value: *

Cost Share Funds: *

(Government award value + cost share)

Cost Share Agreement: ☐ Yes, applicant agrees to provide a minimum of 20% cost share

DOE Laboratory Preference

If known, identify the National Laboratory you would like to collaborate with on the proposed RFA. If known, identify the first and last name of your contact at the preferred national laboratory or facility. Currently, the pilot program is limited to the 8 DOE laboratories in the list box below.

If a preferred facility or point of contact is unknown, DOE will identify the appropriate resources as part of the selection process. For additional information on available resources and capabilities, you may refer to the FESUser Facilities or at any of the DOE laboratory websites listed in the list box below.

DOE Laboratory (if known)

Specific Resource:

Laboratory Point of Contact (if known)

- Unknown
- BNL
- INL
- LANL
- LBNL
- LLNL

Is the involvement of intellectual property anticipated? No

Additional Contact Information

If there are additional Co-PI/Collaborator(s) you wish to identify, please do so below.

Participating Labs

BNL
INL
LANL
LBNL
LLNL
ORNL
PNNL
PPPL

Merit Review Criteria

Request for Assistance applications will be evaluated in accordance with the criteria detailed within the supporting documentation for Merit Review Criteria. Please review before submission.

COMPLETION

After completing and saving this form, the applicant may edit the saved version until Sunday, July 7, 2019 5:00 p.m. EDT.
To submit the application for final review, the applicant MUST click on the "Save and Submit" below. Once submitted, the applicant may "Withdraw and Revise" the application until the close date. Forms in the system that are saved in "Working" status but not "Submitted" are considered incomplete and will not be reviewed.

For assistance with this process, please contact Dennis Youchison at 865-574-0208 or youchisondl@ornl.gov. If you are having problems submitting the form, please contact Lara James at 865-576-3753 or jamesla@ornl.gov.

Save | Save & Submit | Withdraw

INFUSE Innovation Network for Fusion Energy

Ten hints for writing a successful INFUSE Award Request (…or things I wish I knew before I submitted my award request)

1. If you have a DOE national laboratory point of contact (POC), identify them in the appropriate section in the electronic application system. Don't include the POC as part of the proposing team in your proposal, since they are part of the resource you are requesting.
2. If you don't have a DOE national laboratory POC, the INFUSE team can help identify the right national laboratory and appropriate technical leads to assist you in your research needs.
3. Articulate your objective as clearly as possible. Keep this question in mind: Why do I specifically need the DOE national laboratory or resource?
4. Remember, DOE national laboratories are prohibited by law from competing with the private sector, so an award that is asking for general services will not be considered. For example, structural analysis of a reactor building using commercial finite element analysis software is a general service.
5. Awards are not intended to assist you with the fundamental design of the technology you are developing. If you need assistance with a specific design aspect or component of your technology, you must be clear about the requirements and constraints that apply to this component.
6. In general, an award that asks a DOE national laboratory to complete general design work or make decisions on a design, will not be awarded. The laboratories' role is to provide you with the data necessary to make those decisions on your own.
7. Awards are not an appropriate mechanism for tackling large, sustained research and demonstration (R&D) projects or design efforts. An award will not generally be approved for continuation of a previous award. It should be clear that the requested assistance will advance a well-defined aspect or component of your overall technology.
8. Make sure that the assistance that you are requesting can reasonably be completed within one year. Seek the advice of the national laboratory POC to determine cost and schedule estimates.
9. Awards should not be used as a means to request upgrades or additions to DOE infrastructure. They are intended to help you advance your technology using existing national laboratory capability.
10. Think about how your award will enhance or enable development of a technical relationship with the national laboratory, which can be a resource for you all the way from basic research through development and end-use.

April 30, 2019

Important dates:

- June 04: Press release, First solicitation issued for RFAs
- July 07: Proposals due
- August 10: Reviews completed
- August 15: Awards announced via e-mail and posted on the site
- September 15: Funding issued, CRADAs executed & projects start

Our Future

- A subsequent semi-annual proposal schedule is envisioned, based on response to FY2019 pilot program
- FY2020 budget request is ~$4M
- 1st Workshop organized in early FY2020 with U.S. industrial leaders
- Maintain project report library and publicize national laboratory reports
- Obtain feedback and evaluate effectiveness of program