



# Water Power Technical Collaboration Program (TCP) for Advanced Manufacturing and Materials (AMM)

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The program is an effort between ORNL and DOE's Water Power Technologies Office (WPTO)



## Program Overview – Collaboration with DOE's MDF

### Program Intent

Accelerate the development of innovative water power technologies by leveraging the use of Advanced Materials and Manufacturing (AMM)

Leverage the existing ORNL Technical Collaboration Program (TCP) at the Manufacturing Demonstration Facility (MDF)

Collaborate with water power organizations through cost share, short-term collaborative projects to explore daring ideas with minimal investment and limited risk

Provide open and convenient access to national lab infrastructure, with world-leading experts in AMM research and cutting-edge equipment



## Program Overview (cont.)

**Approach:** “Technical Collaboration” projects are **cost-shared strategic partnerships** between ORNL and eligible organizations to demonstrate the application of AMM research and development (R&D) to water power (hydropower plant, pumped storage hydropower, or marine energy) technology through the following approaches:

- **Evaluation:** experiment novel approaches to enhance the efficiency and sustainability of water power technologies and propel new development
- **Development:** partner with AMM experts and leverage existing R&D capabilities to pursue manufacturing techniques and materials that may be uncommon to the industry
- **Validation/adoption:** foster creativity within the industry while mitigating potential risks associated with untested ideas and large-scale investments.



# Program Overview – Eligibility

| Eligible Applicants                                                                                                                                                                                                                                                                                                                            | Eligible Project Criteria                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                   |
|------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| <b>Applicants:</b><br>Limited to industries or research organizations that currently manufacture equipment, process materials, produce manufacturing-related software, and/or integrate energy systems in the U.S. for commercial applications, or to industries that will be able to do so as a direct result of these collaborative efforts. | <b>Outcome:</b> Has a benefit to the broader hydropower or marine energy industries.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                        |
|                                                                                                                                                                                                                                                                                                                                                | <b>Alignment:</b> Has a clear alignment with the <u>Manufacturing Demonstration Facility’s R&amp;D scope and scientific interest</u> and the DOE WPTO’s <u>Advanced Manufacturing and Materials for Hydropower Strategy</u> and/or <u>Multi-Year Program Plan for Marine Energy</u> .                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                       |
|                                                                                                                                                                                                                                                                                                                                                | <b>Non-duplicative:</b> Has a unique scope of work that does not duplicate any currently federally funded projects.                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                         |
|                                                                                                                                                                                                                                                                                                                                                | <b>Project Scope:</b> Has a clear application to water power technologies, including: <ul style="list-style-type: none"><li>• <b>Hydropower technologies:</b> support the capture of energy from the flow of moving water across a pressure or elevation difference.</li><li>• <b>Pumped storage hydropower technologies:</b> support the storage of energy using water at a pressure or elevation difference.</li><li>• <b>Marine energy technologies:</b> support the capture of energy from (1) waves, tides, and currents in oceans, estuaries, tidal areas, (2) free flowing water in rivers, lakes, streams, and man-made channels, (3) differentials in salinity and pressure gradients, or (4) differentials in water temperature, including ocean thermal energy conversion</li><li>• <b>Cross-cutting technologies:</b> support other fields that can advance hydropower, pumped storage hydropower, and marine energy.</li></ul> |



## Objectives

**WPTO is specifically interested in projects that improve the operation and deployment of water power technologies in the following ways:**

Reduce operations and maintenance costs, lead time, and capital costs

Improve component or system performance

Encourage the development of new technology and novel designs

Encourage industry reshoring and increase the availability of critical equipment

Increase worker safety and satisfaction

Validate and certify processes for commercial adopters

Improve sustainability and reduce environmental risk

Inform decision making



## Objectives (cont.)

Proposals must also align with the DOE's Manufacturing Demonstration Facility's mission and strategic goals.

### DOE MDF VISION AND MISSION

- **Vision:** A prosperous and secure America through a strengthened domestic manufacturing base; resilient materials supply chain; thriving, skilled workforce; increased energy efficiency; and clean, affordable energy systems.
- **Mission:** Enable and maximize a unique public-private partnership model that demonstrates, de-risks, and accelerates industry adoption of energy-related materials, platform technologies, and smart manufacturing.

### DOE MDF STRATEGIC GOALS

- **Secure resilient domestic supply chains for clean energy generation** through demonstrating decreased cost, increased performance and reliability, and enabling US manufacturing of components for nuclear, wind, hydro, solar, and geothermal energy.
- **Improve energy efficiency and material performance** for applications in mobility, buildings, grid, industrial and commercial manufacturing, and national security.
- **Accelerate the adoption of smart manufacturing** practices by developing accessible and affordable tools and datasets for manufacturers of all types and sizes.

### MDF Technology Focus

Investigate, improve, and scale to **materials, systems and process methodology** reduce the risk and accelerate the development and deployment of:

#### Additive Manufacturing

Large scale metal systems

Metal powder systems

Composite/polymer systems

Metrology and Characterization

#### Carbon Fiber and Composites

#### Secure Digital Manufacturing/Automation

Manufacturing analytics & simulation

#### Hybrid/Subtractive Manufacturing.

Machine tools



# Process Overview

## How to get started:

- After reviewing this document, please develop a Pre-Application form ([template provided](#)) with:
  - Basic company information
  - Concept description (problem statement, solution, and alignment with program objectives)
- Send the Pre-Application form to [WaterPowerTCP@ornl.gov](mailto:WaterPowerTCP@ornl.gov)

## Process highlights:

- If the concept is within scope, then the ORNL TCP team will set up virtual meetings to establish technical feasibility and mutual interest.
- The TCP team and applicant will co-develop a proposal/project plan for DOE approval.
- Establish a project agreement based on project needs.
- Conduct the agreed upon Statement of Work.
- Develop a final project report.

## MDF TCP Structure highlights

### 1:1 Cost Shared Projects

- No funds change hands
- Industrial partner's cost share is "in-kind" (can be labor, materials, travel, equipment, subcontract costs).

### Funding

- CRADA projects (see below) are capped at \$500K. Collaborations will be managed as: \$240K\*/\$240K\*\* effort (building in a \$10K\*/\$10K\*\* safety)

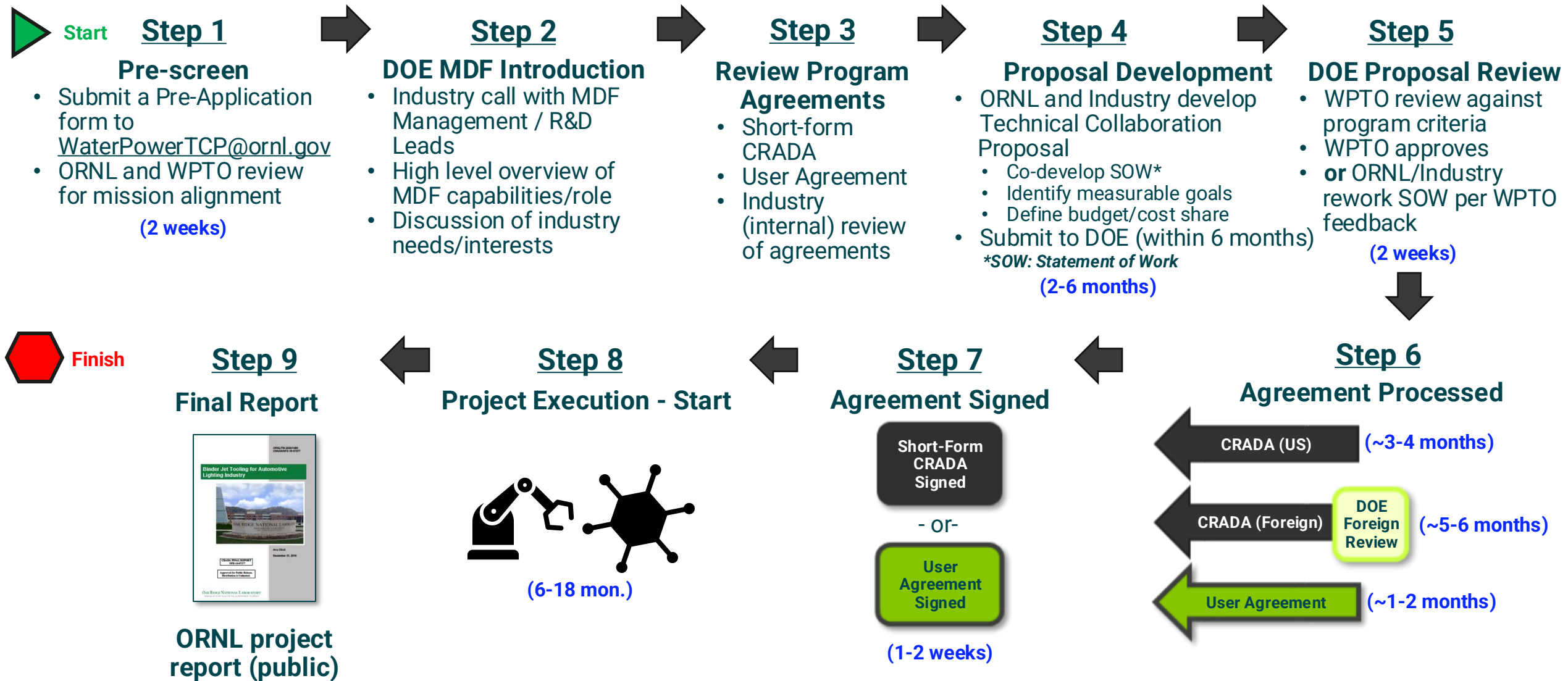
\*Organization in-kind portion \*\* DOE funding to ORNL

### Agreements - Industry/ORNL enter

- CRADA (Cooperative Research and Development Agreement), or
- User Agreement.



# Process Overview (cont.)





# Agreements: Working with Oak Ridge National Laboratory

## CRADA Overview

A Cooperative Research and Development Agreement (CRADA) allows non-federal entities (industry, universities, non-profits, etc.) to collaborate with federal laboratories, such as ORNL, on research and development projects. Under CRADAs, the non-federal partner or another licensee is expected to transfer technologies developed to the private sector for commercial exploitation. CRADAs provide a very flexible way for companies, universities, non-profits, and other non-federal entities to access the unique technologies, facilities, and expertise available at ORNL on a collaborative basis. ORNL's partner is given certain access to rights in ORNL-developed technologies in return for productive collaborative participation in the development of such new technologies.

Click here for a copy of the  
[Short-Form CRADA](#)

## User Agreement Overview

Oak Ridge National Laboratory is home to a number of highly sophisticated experimental User Facilities. These research facilities, instruments, and laboratories are designed to serve ORNL researchers, engineers, and technical staff, as well as external researchers from universities, industries, foreign institutions and other government laboratories. The primary purpose of the MDF User Facility support is to distribute fundamental discovery, evaluation and/or findings of research performed on the unique capabilities of the MDF with industry or academia.

Click here for a copy of  
the [User Agreement](#)

**Note:** UT-Battelle is a nonprofit partnership between the University of Tennessee and Battelle that manages and operates the Oak Ridge National Laboratory for the U.S. Department of Energy. CRADA and User Agreements are established between the participant (industry or university) and UT-Battelle. **DOE does not permit UT-Battelle to negotiate the terms of these agreements.**

# 10 Agreements: Comparison of CRADA vs User Agreement

## Cooperative Research & Development Agreement ("Short-form" CRADA)

## User Agreement (non-proprietary)

|                                     |                                                                                                                                                       |                                                                                                                             |
|-------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------------------------------------|
| Length of engagement                | Longer-term basis of a year or more. Initial agreement term can be up to 24 months.                                                                   | One time blanket agreement, but individual projects typically range 6-24 months.                                            |
| Cost to Company                     | 1:1 Cost-share required. Company contribution is "in-kind", no funds change hands                                                                     | Flexible cost share requirements, company covers it's cost of research, but 1:1 cost share is favored                       |
| Intellectual Property Rights        | Each party owns its own inventions and company has an option to negotiate an exclusive license in a specific field of use to inventions made by ORNL. | Each party owns its own inventions. Jointly developed inventions will be jointly owned.                                     |
| Protection of Generated Information | Commercially valuable information generated under a CRADA may be protected for up to 5 years, depending on funding source.                            | Information generated is publicly available.                                                                                |
| Agreement Terms/Language            | Non-negotiable.                                                                                                                                       | Non-negotiable.                                                                                                             |
| Reason for use                      | Collaborate with the laboratory for the purpose of joint research and development (R&D) activities.                                                   | Intent to distribute fundamental discovery, evaluation and/or findings of research performed, demonstrate state-of-the-art. |



# Agreements: Factors for consideration

## Engaging through a CRADA

CRADAs are specifically technology transfer agreements; technologies developed under CRADAs are expected to be transferred to the private sector for commercial exploitation, either by the non-federal partner or another licensee of such technologies.

Research projects under a CRADA:

- Used where the work to be performed (as described in the statement of work) is done collaboratively by ORNL employees and Participant employees.
- May focus on maturation of a technology portfolio (typically one or more patents or patent applications) that the laboratory has developed and requires further development to achieve commercialization.

## Engaging through a User Agreement

The primary purpose of the MDF User Facility support is to distribute fundamental discovery, evaluation and/or findings of research performed on the unique capabilities of the MDF with industry or academia.

Research projects under a User Agreement:

- Introduce the technology to new industry sectors and/or applications;
- Explore the potential for wholistic energy savings and/or energy production (not just for the company, but for the industry as a whole).
- Share all research results performed by both ORNL and the User are expected through final reports and publications.

Examples of industry use are fabrication, calibration, testing, and evaluation of products and processes.



# Program Documentation: Project Proposal Template

## Proposal Template

- Company Information
- Non-Proprietary Abstract
- Background
- Project Plan and Objectives
- Impact
- Project Reporting
- Project Budget and Schedule

## DOE Proposal Evaluation Criteria:

- **Technical feasibility and merit**
  - Defines the research questions to be answered.
  - Defines what is unique about the work.
  - Defined scope aligns with budget and timeline.
- **Approach and work plan clarity**
  - Work plan delineates tasks for each party, defining desired outcomes and quantitative measure of success.
- **WPTO mission alignment**
  - Enable innovations to enhance the efficiency and sustainability of existing water infrastructure and new developments.
  - Explore innovative/uncommon designs to dramatically lower the cost and open the design space

- Proposals are typically co-developed between the participant and the ORNL researchers that will support the project
- Typically, 6-8 pages when complete
- Proposals are submitted to DOE WPTO for edits or final approval

Click here for the [CRADA Project Proposal Template](#)

Click here for the [User Project Proposal Template](#)

Click here for an [example of a completed Project Proposal Template](#)



## Frequently Asked Questions

### **What are the cost share expectations and what is allowed to be counted?**

- Cost share is expected to be 1:1. No funding changes hands between the parties. In general cost share can consist of the participants expenses in performing their portion of the project scope, such as employee labor, materials, subcontracting of services (ex: testing), equipment loaned to ORNL.

### **What is the typical timeline for proposal development?**

- Full proposals with ORNL are typically developed in 2 – 6 months. Draft full proposals must be submitted to DOE for final approval within 6 months after pre-application is approved or Non-Disclosure Agreement (NDA) is executed (whichever applies).

### **Can the terms of CRADAs or User Agreements be negotiated?**

- No, both the Short-Form CRADA and User Agreement are non-negotiable. The terms of both the short form CRADA and User Agreement are set by DOE and extended to UT-Battelle (operator of ORNL), for use in the program under UT-Battelle's prime contract with DOE (DE-AC05-00OR22725)



## Frequently Asked Questions

### How long does it take to get a project approved/started?

- Short-form CRADA (US owned entity): ~3-4 months from proposal development to project start
- Short-form CRADA (Foreign owned entity): ~5-6 months from proposal development to project start
- User Agreement: ~1-2 months from proposal development to project start

### What is the typical length of a project?

- Projects are typically 6 –18 months in length. A short-form CRADA has an initial term limit of 24 months, which allows projects to be extended if needed.