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Program Intent

• Provide open, affordable and convenient access to national lab infrastructure, hosted resources, tools, and expertise to facilitate rapid development and adoption of new energy efficient manufacturing technologies.

• Collaborate with industry through cost shared projects to investigate, improve, and scale process methodology to reduce the risk and accelerate the development and deployment of innovative energy efficient manufacturing and materials technologies

• Creation and preservation of domestic manufacturing jobs is a primary goal
Approach: “Technical Collaboration” projects are cost-shared strategic partnerships between the MDF and industry that seek to leverage collective assets to address advanced manufacturing challenges through the following approaches:

- **Evaluation**: Explore new materials, systems, software and end use applications to evaluate their use within key technologies and fundamental research that could impact core R&D.

- **Development**: Strategically accelerate the development of advanced manufacturing and energy relevant technologies along with the institutional knowledge that enables them.

- **Deploy/Transfer**: Investigate, improve, and scale process methodology to reduce the risk and accelerate the deployment and adoption of innovative energy efficient manufacturing and materials technologies.

Eligibility: Limited to industries 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.

How to Engage
Contact: Bob Slattery, ORNL, MDF Industrial Collaboration Manager, slatteryrs@ornl.gov

The Toolkit content herein provides program criteria, process for developing a project, proposal template, and program agreement types.
Program Structure

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).

Phased Approach
• Phase 1: $40K*/$40K** effort
• Phase 2: $200K*/$200K** effort
*Industry in-kind portion ** DOE funding to ORNL

“Open Call” Opportunity
• 6-8 page proposal template
• Project proposals submitted to DOE-AMO every 2 weeks.
• Proposal review/decision provided by 2 weeks after submission.

Agreements - Industry/ORNL enter:
• CRADA (Cooperative Research and Development Agreement), or
• User Agreement.

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 Mfg./Automation
  • Mfg. analytics & simulation

• Hybrid/Subtractive Mfg.
  • Machine tools

Project Criteria
Projects should satisfy one or more of the following criteria:

• Alignment with ORNL Core R&D
  • Projects that accelerate ORNL’s core R&D efforts within the Technology Focus areas

• AMO mission alignment
  • Reduce manufacturing energy intensity or produce new, energy-efficient products.
  • Advance clean energy systems and applications (support of other DOE EERE program efforts)

• Advance Technology Adoption
  • Dissemination of the state-of-the-art in AM and composite technologies

• Advance the US mfg. workforce
  • Develop of the human capital pipeline in advanced mfg.
Agreements: Working with Oak Ridge National Laboratory

**User Agreement (non-proprietary)**

- **Length of engagement**: Typically 6-24 months.
- **Cost to Company**: Flexible cost share requirements, but 1:1 cost share is favored.
- **Intellectual Property Rights**: Each party owns its own inventions. Jointly developed inventions will be jointly owned.
- **Protection of Generated Information**: Information generated is publicly available. Subject inventions protected from public disclosure to allow for patent application.
- **Reason for use**: Intention to share findings publicly, demonstrate state-of-the-art.

**Cooperative Research & Development Agreement**

- **Length of engagement**: Longer-term basis of a year or more.
- **Cost to Company**: 1:1 Cost-share required.
- **Intellectual Property Rights**: Companies own inventions they make and have an option to negotiate an exclusive license in a specific field of use to inventions made by ORNL.
- **Protection of Generated Information**: Commercially valuable information generated under a CRADA may be protected for up to 5 years, depending on funding source.
- **Reason for use**: Cost shared collaboration and path for protection of sensitive information generated within project.

**Strategic Partnership Project (Proprietary)**

- **Length of engagement**: As defined by agreement.
- **Cost to Company**: Company covers full ORNL cost to execute scope of work.
- **Intellectual Property Rights**: Companies own intellectual property made or created using corporate funds as a result of these engagements.
- **Protection of Generated Information**: Companies paying for services with corporate funds can treat all generated data as their proprietary information.
- **Reason for use**: Desire to retain all generated IP, sponsor sets direction of SOW.

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Agreements utilized within Technical Collaboration Program
Agreements (cont.)

Cooperative Research & Development Agreement (CRADA)

“Short-Form” CRADA
• Used for DOE “Technical Collaborations” Phase 1 & 2 projects
• Flexible work scope
• Fast Track Approval for US owned entities, ~90 days from concept to project start
• Non-negotiable terms

Type of CRADA utilized within Technical Collaboration Program

Traditional CRADA
• Typically used for larger R&D efforts
• Work scope contributes to strategic core research efforts at MDF
• Longer development time than short-form CRADA depending on negotiation of terms
• Negotiable Terms
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.

- Used where the work to be performed (as described in the statement of work) is done collaboratively by ORNL employees and Participant employees.
- Work 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.
- Each party owns its own inventions; Participant is granted a first option to negotiate an exclusive filed of use license in ORNL-owned inventions created under the CRADA. Generated Information that is not patentable can be kept confidential as Protected CRADA Information for up to 5 years.

CRADA

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.
MDF Technical Collaborations Process Flow

**ORNL MDF Introduction**
- Industry call with MDF Management / R&D Leads
- High level overview of MDF capabilities/role
- Discussion of industry needs/interests

**Review Program Agreements**
- Short-form CRADA
- User Agreement
- Industry (internal) review of agreements

**Proposal Development**
- ORNL and Industry develop TC Proposal
- ID Phase 1&2 SOW
- ID measurable goals
- Define budget/cost share

**Proposal Submission**
- ORNL submits to DOE
- Submissions every 2 weeks

**DOE Proposal Phase 1 Review**
- DOE-AMO review against program criteria
- AMO approves
- or ORNL/Industry rework SOW per AMO feedback

**Proposal Phase 2 Review**
- Proposal updated with Ph1 findings, resubmitted to DOE
- AMO approves
- or ORNL/Industry rework SOW per AMO feedback

**Project Execution**
- Phase 1 SOW executed (6-12 mon.)
- If no Phase 2, final project report issued

**DOE Proposal Phase 2 Review**
- Proposal updated with Ph1 findings, resubmitted to DOE
- AMO approves
- or ORNL/Industry rework SOW per AMO feedback

**Project Execution**
- Phase 2 SOW executed

**Final Report**
- ORNL project report (public)

**Cycle time Summary: Proposal Development to Project Start**
- CRADA (US): 3-4 months
- CRADA (Foreign): 5-6 months
- User Agreement: 1-2 months
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.

• AMO mission alignment
  • Improves the productivity and energy efficiency of U.S. manufacturing.
  • Reduces lifecycle energy and resource impacts of manufactured goods.

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 AMO every 2 weeks for review and approval.