NREL Process Development and Integration Laboratory (PDIL)

Proposal Writing Guidance Summary

August 2010

About the Process Development and Integration Laboratory

The Process Development and Integration Laboratory (PDIL) is located within the Science and Technology Facility at the National Renewable Energy Laboratory (NREL). The PDIL brings together technical experts from NREL, the solar industry, and universities to access unique process development and integration capabilities. The focus of their research includes gaining a deeper understanding of semiconductor physics, creating better materials, developing novel device structures, and improving manufacturing methods. In addition, our experts develop new measurement techniques for use by in-house and outside scientists.

The National Renewable Energy Laboratory (NREL) works with industry and organizations to transfer renewable energy and energy efficiency technologies into the marketplace. The NREL Technology Transfer Web site informs potential partners on all the possible ways that they can work with NREL regarding formal partnerships.

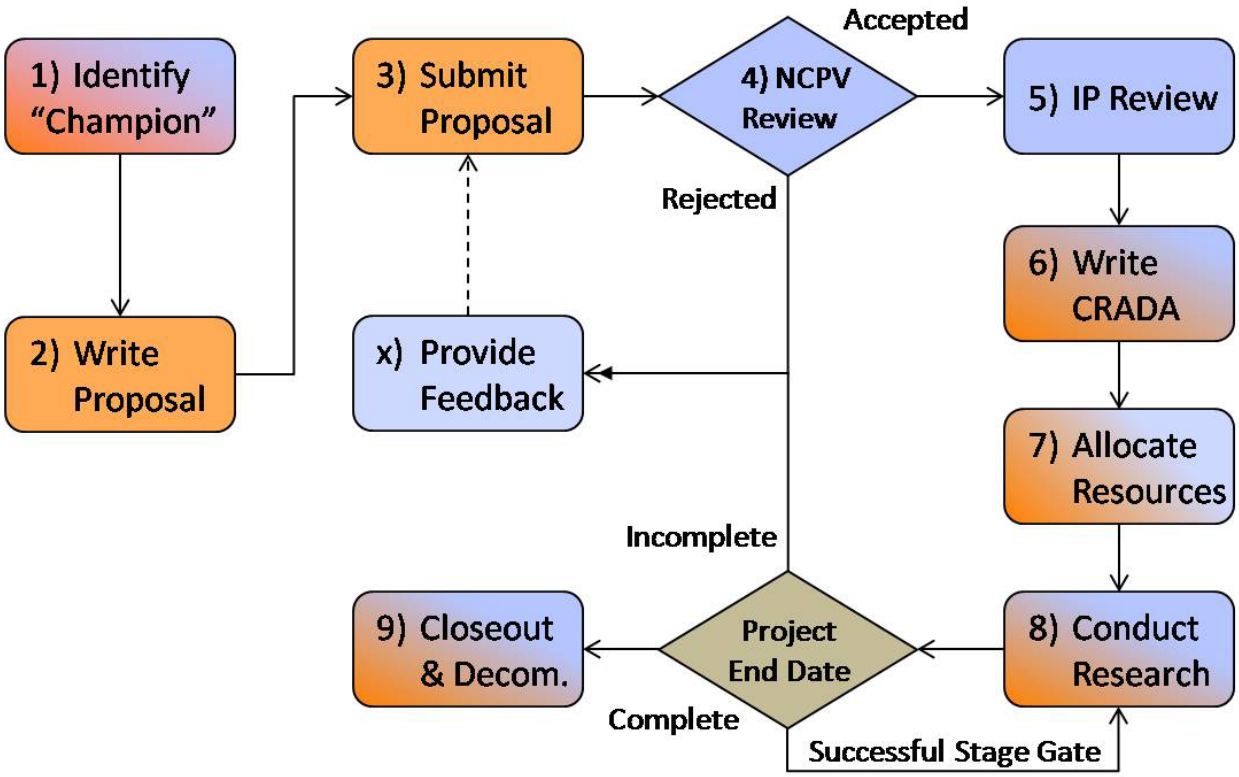
We offer many opportunities and ways for you to partner with us. Learn more about our technology partnership agreements and services:

- Cooperative Research and Development Agreements (CRADAs)
- Technologies Available for Licensing
- Technology Partnerships
- Work for Others (WFOs)
- Research Facilities

The PDIL Proposal Process

NREL's Technology Transfer Program has a strong track record of success. Over the past 10 years, 424 new records of invention (ROIs) have been disclosed to NREL, resulting in 285 active patents and patent applications and 86 active license agreements. The National Center for Photovoltaics (NCPV)—NREL's premier research facility for photovoltaics—is responsible for nearly a third of all ROIs and active patents and patent applications. Nearly 70% of all photovoltaics-related issued patents have been licensed to industry. NREL has 33 active license agreements with 31 distinct companies for PV-related technologies and is widely recognized as setting industry standards for PV licensing.

A decision-making approach is used to select and approve projects and partners for the PDIL, and the decision flow chart is shown below.



Decision process for approving PDIL projects and partnerships.

More information is available on the principles that NREL uses for establishing mutually beneficial technology partnerships.

Steps in Executing a Successful Proposal

1) ***Identify Champion:*** Before investing significant effort in writing a proposal, it is best to find an individual within the NCPV that can guide the proposal in terms of appropriateness and availability of resources. Personnel responsible for the PDIL tools can be found on the capabilities Web pages.

2) ***Write Proposal:*** Based on the needs of the proposer and the mutual benefit of working with NREL, a proposal is written that provides details on the following elements:

   a. Introduction: Summarize the purpose and contents of the proposal.

   b. Background: State the problem, issue, or question the proposal will resolve (the "why").

   c. Proposal: Describe the work to be performed and the expected results (the "what").

   d. Benefits: Describe the benefits of success to both the proposer and NREL.

   e. Methodology: Describe the details of the work to be performed (the "how").

   f. Decommissioning: If necessary, describe equipment disposition and/or decontamination.

   g. Schedule: Highlight the major milestones and stage gates for phased projects (the "when").

   h. Qualifications: Briefly list qualification of key participants and short resumes (the "who").

   i. Resources: List the resources need from and/or provided to NREL (skills and equipment).

   j. Conclusion: Highlight key elements and final thoughts.

3) ***Submit Proposal:*** Proposals should be submitted to the NCPV Business Development Council, c/o John Benner, 1617 Cole Blvd., Golden, CO 80401, john.benner@nrel.gov

4) ***NCPV Review:*** The NCPV Business Development Council will review the proposal based on the criteria listed on the next page. Successful proposals will appropriately address those criteria. Unsuccessful proposals will receive feedback based on these criteria. Select proposals can be reworked for resubmission provided they are viewed as having potential to become viable proposals.

5) ***Intellectual Property Review:*** Once a proposal is accepted by the NCPV Business Development Council, legal review will start with the goal of writing a business contract, usually a Cooperative Research and Development Agreement.

6) ***Write CRADA:*** This agreement will spell out the contractual details of the proposal.

7) ***Allocate Resources:*** This list includes items such as equipment, consumables, and personnel.

8) ***Conduct Research:*** The CRADA is executed. If stage gates are spelled out in a phased proposal, then continuation of the work depends on successful completion of stage gate goals.

9) ***Closeout and Decommission:*** Upon proposal deadline and completion of the proposed work, the project is closed out, and equipment receives appropriate disposition, including decontamination, if necessary. If the goals were not met, reproposals may be resubmitted if applicable.

PDIL Decision Criteria for Industrial Partnerships

The selection/decision criteria used by the NCPV Business Development Council are the following:

1. ***Compatible with PDIL Mission?*** PDIL Mission Statement: "To accelerate the research, development, and adoption of industrial-viable PV conversion technologies by applying advanced, integrated approaches and tools to accelerate the development of proof-of-concept, manufacturable devices."

2. ***Preliminary Safety Screen.*** Independent assessment by NREL EHS Team. Requires enough details from proposed project to satisfy a preliminary, but confident, assessment of the risk factors and any modifications of laboratory operations and/or systems.

3. ***Technology Assessment/Likelihood-of-Success?***
    - Technical risk level (H, M, L).
    - Business risk level (H, M, L): 1) CEO, team, finances? 2) Merits of the concept and approach?

4. ***Expected Outcomes and Benefits to Stakeholders?***
    - DOE, relative to the Solar Energy Technologies Program (SETP): e.g., acceleration of a significant PV technology to market
    - NREL Mission and Strategic Plan
    - Relative to the specific partner/collaborator
    - Relative to existing CRADA partners/teams
    - Other defined stakeholders (e.g., DOE/NREL subcontractors)
    - New NREL competency, experience, or equipment.

5. ***Intellectual Property and CRADA Requirements?***
    - Is the proposed partnership compatible with CRADA policies and requirements?
    - Partner requirements acceptable to DOE/NREL?
    - Degree of difficulty/costs to reach a mutually acceptable point?
    - Conflicts with any existing NREL intellectual property agreements?

6. ***Costs/Revenues?***
    - Costs to DOE?
    - Costs to NREL?
    - Cost-sharing
    - Funds-in for NREL?

7. ***Resource Availability?*** (Does NREL have capabilities and "bandwidth" to complete work in a timely manner? If not, can/will the partner and/or DOE provide the required resources?)
    - Skilled staff, including an NREL lead-person
    - Tool time
    - Laboratory equipment and space
    - Schedule and time-scale of NREL commitments.

8. ***Impacts on Existing Commitments and Projects?***
    - DOE Annual Operating Plan (AOP) milestones and SETP
    - Existing partners/collaborative R&D, CRADAs
    - Work For Others
    - Staffing, operations, and the overall PDIL facility.

9. ***Closeout and Decommissioning Plan?***

10. ***Final Safety Assessment and Approval to Proceed***