



Advanced Materials for Energy Grant Program

November 9, 2009 – January 31, 2010

Proposal Instructions and Judging Criteria

The PA Nano Center, with the support of the Department of Community and Economic Development of the Commonwealth of Pennsylvania and the Air Force Research Laboratories, will be funding **two types of grants** to accelerate the commercialization of advanced materials and nanomaterials technologies for energy applications. These grants are for **A. Pre-Commercialization Projects** and **B. Commercialization Projects**. The details for each type of grant are summarized below.

The proposed technology **must demonstrate a unique solution to an energy problem**. Refer to the Energy Technology Roadmap to show that the proposed project fits within the technology areas of focus of the Center. (http://www.pananocenter.org/Docs/Pdf/Energy_Roadmap_11_9_09.pdf)

	A. Pre-Commercialization Projects	B. Commercialization Projects
Grant amount	\$30,000	\$130,000
Project duration	3 - 6 months	12 - 14 months
Eligibility	Researchers at Pennsylvania universities or companies with established research capabilities.	Pennsylvania-based companies. Partnerships strongly encouraged (i.e. start-up with large company, or university with company)
Match requirement	1:1 match, cash or in-kind	Minimum of 50 % cash or in-kind match
Stage of Technology Development	Technology reproducible at lab scale, and unique compared to current state of art.	Technology focused on a specific application, product or process.
Commercialization Requirement	Support letter and/or match from a PA company showing support for one or more product applications.	Market need identified, and interest (support letter) from potential customer. Demonstration of commercialization capability (either from proposer or through partnership)



Submission Timetable

The following is a schedule of key dates for Round 7 of the submission of proposals. Note: due to unforeseen circumstances, this schedule may change. Proposers need to monitor the web site regularly for announcement of changes to the timetable.

Website Open for Idea Submission	November 09, 2009
Feedback to Idea Submissions	Nov. 09, 2009 – January 15, 2010
Close of Formal Proposal Submission Window	January 31, 2010 (Midnight)
Notification of Awards	March 31, 2010

Pre-Submission Processes (Optional)

Prior to the final proposal submission, proposing teams are encouraged to take advantage of the pre-submission opportunities to gain feedback from the Center staff.

Idea Submission Process: An informal submission to provide the Center with a general, non-confidential description of both the commercial and technical project concepts. In response, the Center will provide feedback regarding how well the project idea fits the Center's mission for funding. [Idea Submission Template](#)

Final Application Process

Proposals should be submitted to the Center in Microsoft Word and using the respective format (**A.** Pre-commercialization and **B.** Commercialization proposals). There are proposal templates for each type of grant that includes all required sections posted on the Center's website; all proposing teams are encouraged to reference this template. All necessary proposal components must be saved into and submitted as one file. Then attach the final proposal document to an e-mail addressed to the Center's Research Commercialization Program Manager, Dr. Leoné Hermans-Blackburn at leonehb@pananocenter.org.



A. Pre-Commercialization Grant Proposal

All proposals will use the following six general topics and will be judged under the criteria described in each section. APPROXIMATE weighting for each section is as follows:

- | | |
|---------------------------------------|-------|
| 1. Technical Innovation and Viability | ~ 40% |
| 2. Market and Customer Appeal | ~ 30% |
| 3. IP Status | ~5% |
| 4. Project Plan | ~20% |
| 5. Match Requirement and Budget | ~5% |

1. Technical Innovation and Viability

This section should be a description of the current status of the technology

- Clearly state the uniqueness of the technology over existing state of the art.
- Describe the current status of the technological developments.
- Include data that shows lab scale reproducibility.

2. Market and Customer Appeal

- Describe potential new product application/s.
- Summarize any communications with potential customer/s and/or other interested parties.
- Explain how the match commitment from the corporate sponsor will be applied: *e.g.* in-kind marketing study; develop commercialization strategy etc.
- Include evidence (*e.g.* Letter of Support) showing support for one or more product applications.

3. Intellectual Property Rights

Describe the particulars of the Intellectual property

- Indicate the current status of the intellectual property –include information on patent/s filed and issued.
- Include an explanation of the proposer’s access to and right to practice the technology both needed for and developed during the proposed project.

4. Project Plan

Describe the purpose and/or goals of the milestone tasks (technical and commercial) with respect to establishing the technology’s commercialization potential.

- Include a succinct technical and commercial objective statement.
- Outline the project plan detailing the Technical and Commercial tasks to achieve the key milestones.
- Note: There will be at least two formal project review (milestone) meetings.



5. Project Budget

Clearly outline the details of the cost share requirement (1:1 match either cash or in-kind) to fulfill the match requirement. Note: For university research proposers, budget/expenses should not include to pay university or other institutional overhead or to pay any later fees, penalties, or damages due to any third party by Recipient.

For both the proposing team and cost share partner:

- Detail the direct (e.g. labor hours and fringe; materials; equipment and travel) and indirect costs.
 - Please indicate if any funds will be applied to Subcontracting costs.
 - If university overhead is applicable, it may be applied as match.
-



B. Commercialization Grant Proposal

Proposal Format and Assessment Criteria

Proposals should demonstrate a balance of innovative technical solutions and real commercial potential for either commercial markets or defense applications. The Center does not fund fundamental research per se. Instead it supports the commercialization oriented development of a technology which has been clearly demonstrated in the laboratory and is linked to a product or process. The project will take that technology and initial market concept and develop it to a working prototype or repeatable process which can be scaled to manufacturing.

All proposals will use the following six general topics and will be judged under the criteria described in each section. APPROXIMATE weighting for each section is as follows:

- | | |
|--|-------|
| 1. Technical Innovation and Viability | ~ 25% |
| 2. Definition of Market and Customer Need | ~ 20% |
| 3. Commercialization Strategy (includes Future Plans and Partners) | ~15% |
| 4. IP Status and Value to Nano Center | ~10% |
| 5. Project Plan | ~20% |
| 6. Budget, Financials, and Match | ~10% |

1. Technical Innovation & Viability

The researcher needs to demonstrate that the proposed research project is a unique approach or leads to a breakthrough discovery that can be distinguished from existing work in the technical area. The researcher's background work must be credible and be original research in the field. This can be demonstrated through a list of published articles, thesis work etc. Please be sure to explain the feasibility of the project as well.

In addition, the researcher needs to show that the proposed project fits within the technology areas as outlined in the Energy Technology Roadmap. Each proposal should clearly identify which technology sub- area of this Roadmap is being addressed.

Lastly, the stage of technology development to be undertaken in the proposed work should be clearly defined. The Center does not support fundamental research which has no particular application. The proposal must demonstrate that the technology is proven, and has a defined, repeatable and documented process. Alternatively, the Center does not fund development which is merely a slight modification to an existing technology or process which produces a minor change to an existing product. For more information, see the Center's role in the Product Development Cycle diagram on the first page of this document or contact the Center for further clarification.

Patents that are cited in the proposal as critical to the success of the project should be clearly described. Please include a copy of the first page of each critical patent in the references section of the proposal.

2. Definition of Market and Customer Need

The proposed technology development needs to have a commercial application. The proposing team must demonstrate that the final outcome from the project (product or process) fulfills a commercial need. This could be an enhanced benefit (e.g. improved corrosion resistant coating) or an entirely new effect (e.g. variable index of refraction under different conditions). The stated need should be supported



by presenting an understanding of current and relevant market research. This should include the status and size of the current market, potential customers, existing competition and competitive technologies. It is expected that the commercialization member of the proposing team can demonstrate credibility in understanding and acting on the commercial marketplace need. In addition, the Center encourages the proposing team to outline how the proposed project will benefit future growth of Pennsylvania companies.

3. Commercialization Strategy

Proposals must clearly demonstrate that the proposing team has considered both the current state of the technology, the expected commercialization goal of the project, and the proposed steps that will be taken to reach this goal. The project plan should clearly identify commercialization milestones such as prototype development, reaching agreements with customers, continued market analysis, customer prototype evaluation, etc.

3.1 Partnerships

The Center believes that collaboration between startup entities and established companies yields the highest probability of successful product development. The Center only accepts proposals from proposing teams which are led by a commercial organization based in Pennsylvania. A commercial organization can be a company of any size, but must have the ability to commercialize and produce saleable products. The Center believes that a commercial entity is needed to (a) confirm the actual market need and (b) provide focus to the research and development towards that market need.

Partnerships for product development can be defined in several ways, for example:

1. A small company (pre-revenue) + a large company
2. A university researcher and a small company in revenue stage
3. A university researcher + a large company (interested in licensing the developed technology, for example)

The proposal should therefore describe the commercial partner, its corporate structure, the relationship that has been established between commercial partners and any noncommercial researchers or other partners in the proposal. This information should be included in the Definition of Roles agreement signed by all members of the proposing team. This agreement is shown in Appendix D. ***The Center only supports projects from U.S. owned companies with substantial research or manufacturing facilities located in Pennsylvania.***

3.2 Future Plan

The Center provides funding to bridge the gap between laboratory proof of concept research and a prototype product or process. The funding is not intended for transitioning the idea or technology to full stage manufacturing. Therefore, each proposal submitted to the Center should provide a brief description by the proposing team outlining their ideas on the next steps after the conclusion of the project. Examples include: licensing by one of the commercial partners, licensing to non-partner companies, and/or seeking funding from venture capital companies.

4. Intellectual Property (IP) Rights and Value proposition for the Center

4.1 IP Policy



The Center has defined an IP Policy which defines how IP rights are shared between the various proposal partners and the Center. Each proposal should clearly indicate that the proposing team will follow this policy.

For company-university partnership teams

The Center has a clearly defined IP Policy in place with Carnegie Mellon University, The Pennsylvania State University, The University of Pittsburgh, and Lehigh University. If the proposing team involves one of these four universities, the Center requires that the proposed work and partnership follow the Center's pre-defined university IP policy. This policy can be obtained via the Center's website.

For company-company partnerships

The Center also has a general IP policy applicable to the relationship between the Center and company-company teams. The details of this agreement should be discussed on a case-by-case basis by contacting the Center's Executive Director, [Dr. Alan Brown](#).

4.2 Value to the PA NanoMaterials Commercialization Center

The proposal should define the value proposition to the Center. This value proposition should lay out the business case for why the Center should fund the project. For example, the member of the proposing team which will own the IP developed during the project could agree to license that IP to the Center for further commercialization in other market sectors or product applications that are not of interest to the proposing team (i.e. outside of field of use). NOTE: the proposing team is also encouraged to suggest other areas of mutual benefit to the Center and the proposing team, other than IP rights sharing. Examples of such other areas are; assistance by the Center in identifying future investment partners, project management services or commercialization partnerships.

Each proposal submission that does not involve one of the four partner universities should include the Field of Use (FOU) document. This document will use the format described in Appendix E.

Because the Center is funded by the state of Pennsylvania and the Department of Defense, each year the Center is required to report data back to its funding agencies concerning the **economic impact** resulting from projects funded by the Center. Therefore, all teams awarded product development grants will agree to participate in surveys designed to evaluate such impact.

5. Project Plan

Each project submitted to the Center must contain a project plan which clearly states;

- Technical and commercial project objectives
- Names of the project manager, principal researcher(s), and primary person responsible for commercialization.
- Key technical and commercial milestone descriptions and dates for achieving those milestones
- Agreement to provide written reports at each milestone date, and a final report (found in Appendix F).
- Agreement to present a summary of project status to the Center's funding agencies as required by the Center.



The project plan should include a detailed milestone plan which shows the resources and estimated days of effort planned to meet each milestone. It is expected that the entire project will be 9 – 12 months.

The plan should contain a brief section on risks and contingencies to manage those risks. For example, technical risks, process or equipment risks, staff availability, etc.

Each project team which is funded by the Center will be responsible to hold regular (typically quarterly) review meetings with the Center staff and other key individuals, such as members of the Technical Advisory Committee, Board Members, and the Center's funding agencies. These review meetings should be clearly identified in the project plan.

6. Budget and Financial Plan

Each proposal submitted to the Center must contain a budget for the project. This budget will be broken down into the following categories; labor hours by resource, travel expense, materials, and equipment purchase, subcontracting costs, and other.

In addition, the financial plan should outline whether there will be any cost-sharing (match) funds that will be applied to supplement the Center's funding. Cost-sharing can be either cash or in-kind support. In-kind support can include laboratory equipment usage, laboratory analysis, other services, or labor paid for by another funding source. Although the Center does not specifically require cost-sharing for funding a project, a financial commitment from the proposing team will significantly enhance the probability of receiving funding from the Center. Typical proposals to the Center include at least 25% of the requested amount as additional match from the company. If match is provided, the proposal should outline the source (federal, state, private) of that match.

Eligible Costs

The funding provided for eligible projects will be in the form of a grant. It will cover 100 % of the actual and direct project costs agreed to between the proposal team and the Center. Overhead on these costs may be allowed and will be negotiated depending on where the research is conducted and the source of funding by the Center. The following are typical categories of costs allowed:

- Personnel salaries
- Materials
- Equipment (up to a maximum of 20 % of the total project costs)
- Market assessment study
- Subcontracting (with appropriate justification)

Confidentiality

The Pennsylvania NanoMaterials Commercialization Center will use reasonable efforts to safeguard all information submitted in proposals. All applications will be sent to the Center's Executive Director and Research Commercialization Project Manager, who in turn will share the information with the Center's Technical Advisory Committee and Governing Board for review. Each individual on the Center's Governing Board, Technical Advisory Committee and General Advisory Committee will treat this information as confidential.



Please include the following:

- The cover sheet for each proposal should use the template in Appendix A.
- The checklist provided in Appendix B should be completed accurately and attached behind the cover sheet.
- A one page Executive Summary should be attached as the third page, following the checklist (see proposal template).
- The Subrecipient Agreement Contract Review (SACR) form in Appendix C should be completed and attached after the body of the proposal (see template).
- The SACR form is intended to provide feedback to the Center regarding the proposing company's understanding and initial acceptance of the Center's standard award contract, and to highlight any areas that may need further discussion. The standard Subrecipient Agreement Contract is posted on the Center's website and should be reviewed in order to complete the SACR.
- All other documents that the proposers wish to be included in the proposal review should be added into the References section.