DEPARTMENT OF ENERGY
Bonneville Power Administration
P.O. BOX 3621 • PORTLAND, OREGON 97208-3621

FY17 TECHNOLOGY INNOVATION FUNDING OPPORTUNITY ANNOUNCEMENT
FOA#: BPA-0003602

Announcement Issue Date:	March 1, 2016
Registration Due for Pre-Application Conference:	March 8, 2016
Pre-Application Conference Call, Live Meeting, 1:00-2:30pm PST:	March 10, 2016
Phase 1–Concept Paper and Statement of Qualifications, 4:00pm PDT:	March 31, 2016
Notice to Applicants to Submit Phase 2 Applications:	April 8, 2016
Phase 2–Full Application Due Date, 4:00pm PDT:	May 2, 2016
Intent to Award Notices:	July 7, 2016

The following is a Bonneville Power Administration (BPA) competitive announcement for the Fiscal Year (FY) 2017 Technology Innovation Portfolio. BPA's Technology Innovation (TI) Office conducts an annual opportunity announcement for projects that advance technologies based on agency guidance and strategic needs identified in the agency's Technology Roadmaps and Focus Area. BPA uses a two-phase process to identify and select these potential research and development opportunities. In Phase 1, BPA will accept concept papers and detailed supporting information for consideration. In Phase 2, BPA will then invite those parties who met the qualifying criteria to submit full applications under this announcement. All documents shall be submitted electronically through the BPA Funding Opportunity Exchange (BPA Exchange) website: https://bpa-exchange.energy.gov

Please review the entire announcement prior to submitting any documents. BPA is under no obligation to consider submittals that do not include all the required information. Detailed requirements are noted from Part I through IV. Any amendments to this announcement will be posted on BPA Exchange. Applicants should periodically review the website for any updates as no other notices will be provided. Questions and answers will be posted on BPA Exchange using the link on the left side of the page.

Applicants are reminded that Bonneville's financial assistance and acquisition decisions and administration are not governed by the same rules and regulations of other federal agencies. Bonneville financial assistance is subject to the policies and procedures outlined in the Bonneville Financial Assistance Instructions (BFAI) and acquisition contracts are subject to the Bonneville Purchasing Instructions (BPI), both of which are prescribed by the Head of the Contracting Activity. The BFAI and BPI may be downloaded from the BPA website at http://www.bpa.gov by selecting "Doing Business."

If you have any questions not addressed on BPA Exchange or in this announcement, please contact Karen Wolfe, Financial Assistance Officer, at 503-230-3448 or e-mail ktwolfe@bpa.gov. Contacting BPA program officials for information related to this announcement is prohibited.

Sincerely,

Karen Wolfe

Karen Wolfe
Financial Assistance Officer

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PART I – FY16 TECHNOLOGY INNOVATION FUNDING OPPORTUNITY DESCRIPTION

A. BACKGROUND

The Bonneville Power Administration (BPA) is a federal power marketing agency that transmits and markets power from 31 federal dams and one nuclear power plant. BPA also purchases power from several wind farms. BPA's Technology Innovation Office conducts an annual opportunity announcement for projects that advance technologies based on agency guidance and strategic needs identified in the agency's Technology Roadmaps. Previous announcements resulted in projects that addressed the Technology Roadmaps in areas of Energy Efficiency and Demand Response, Hydro Power Operations, Renewable Energy, Physical Security, and Transmission Services.

In support of its research, operation, and maintenance goals, BPA has its own set of nationally recognized Laboratories. The Labs are located at BPA's Ross Complex in Vancouver. Laboratory capabilities for high voltage, high current, mechanical, chemical, environmental field testing services, and staged system fault services are specifically tailored for BPA system needs. The Labs provide services that are important to ensuring regional system reliability and provide a conduit for the development and demonstration of new technologies needed to modernize the electrical energy infrastructure and to ensure safe and efficient operation of the power system.

Since 2006, the BPA has actively invested in technology road-mapping. Technology road-mapping is a form of technology planning that is used to inform and guide the agency's research and development agenda. The main benefit of technology road-mapping is that it provides information to make better technology investment decisions by identifying technologies and technology gaps that are critical to improving BPA's power delivery system. The Roadmaps are then used to identify ways to leverage Agency investments to bridge these gaps.

B. OBJECTIVE

This Technology Innovation (TI) Funding Opportunity Announcement is for projects beginning in BPA's Fiscal Year 2017, which runs from October 1, 2016 through September 30, 2017. Projects may be submitted for up to 36 months in length, but BPA will only fund on a fiscal year basis (October – September). Funding for future periods is subject to annual approval. Applicants should allow some flexibility in their startup planning to allow for kickoff meetings, contracting, and minor project adjustments. The goal is to select technology innovation projects that advance our ability to maximize the Federal Columbia River Power Systems (FCRPS) asset value and that do so by improving BPA's ability to monitor, control and use all of FCRPS assets in an integrated manner. This TI Funding Opportunity does not purchase power nor imply any commitment to purchase power from any resource(s) for BPA.

A requirement for an acceptable technology innovation application is that it fulfills BPA's objectives to be a leader in the application of technologies that provide benefits to BPA, its customers and the region. Project sponsors will need to demonstrate that submitted projects are meeting the challenges of BPA. Consequently, the proposed projects would need to benefit BPA (directly or indirectly); though supporting research can draw from a multitude of informational and technological resources worldwide.

C. TECHNOLOGY ROADMAPS

Key components of the portfolio selection process are the Technology Roadmaps. The roadmaps clearly articulate the research that is needed in a given technology area. The roadmaps show how the R&D Programs in a given area relate to technology characteristics, capability gaps, and strategic business drivers. BPA is interested in receiving proposals that investigate the R&D Programs identified in the following roadmaps available at the BPA Technology Innovation Home Page, www.bpa.gov/ti.

- Collaborative Transmission Technology Roadmap (including addendum and appendix) (March 2016)
- Demand Response Technology Roadmap (March 2015)
- Power Generation Asset Management Technology Roadmap v.2 (March 2016)
- Energy Efficiency Technology Roadmap Volumes 1, 2, 4, 5, 6, 7,8 and appendixes (March 2015) and Vol. 3: Lighting (March 2016)

For more guidance about the types of energy efficiency research that may benefit BPA and the Pacific Northwest refer to the Northwest Power and Conservation Council's website and the Sixth Northwest Conservation and Electric Power Plan. The Council's resource strategy for the Sixth Power Plan provides guidance for BPA on choices that will help meet the region's growing electricity needs while also reducing the risk associated with uncertain future conditions.

D. TECHNOLOGY FOCUS AREA

The Technology Roadmaps identify business and operational challenges, technical needs, required capabilities, technology gaps and associated R&D programs that BPA could research to enhance its ability to maximize FCRPS asset value. Within each of the technology roadmaps, and across all of the roadmaps, BPA is calling out the importance of flexible operations as a focus area given the ongoing evolution of within-hour energy markets and impacts of consumer demands for energy independence via distributed generation options.

BPA is interested in receiving proposals that address technologies and/or technology gaps that enhance BPA's ability to monitor, control and use the BPA's FCRPS (hydro, transmission, energy efficiency & demand response) assets in an integrated manner to operate the system flexibly to manage real-time operational requirements, fluctuations in load-resource balance and within-hour dispatch of energy.

For example, within the Federal Columbia River Power System, the ability to understand and anticipate the value potential of flexible operations is a key element for BPA to derive full value from new circumstances evolving within the Western Interconnected electric grid. Similarly, transmission faces challenges in moving to new operating paradigms arising from higher uncertainty in load patterns and changes in markets and product offerings that [require improved] demand real-time visibility (situational awareness), control equipment, and computational capability. As well, in demand side management, new combinations of responsive assets bring flexibility to the future BPA needs.

To that end, the BPA is interested to receive research proposals that address advancement in flexible operation technologies based on BPA's Technology Roadmaps. Research activities can range from advancing the science and engineering of a particular resource technology to demonstration projects that enhance the commercial viability and acceptance of the technology, to solving technical challenges associated with the advancement of flexible operations.

E. BPA FURNISHED INFORMATION, PROPERTY OR SERVICES

BPA may provide limited services needed for the successful completion of the proposed project such as access to a substation, field support or system data and models. The application must explicitly identify any government furnished information, equipment or services that may be needed to complete the project in accordance with Part IV of the announcement. As much detail as possible is needed so that BPA can determine the level of effort required to assist the project and determine the sensitivity rating of the data.

Applications should not expect BPA to provide substantial equipment (for example generation equipment such as an ocean buoy or wind turbine, control systems, cabling, transformation or interconnection to the BPA transmission system) for use during these projects.

F. FEDERAL INFORMATION SECURITY MANAGEMENT ACT OF 2002 (FISMA)

Recipients who plan on collecting or receiving BPA information such as system data and models should review the applicable clauses in Part VII to ensure that Information Technology systems and security protocols meet the stated criteria.

If BPA approves the project to receive BPA furnished data or collect data on BPA's behalf, the recipient is required to satisfy FISMA, as a requirement of the terms and conditions. Data furnished by BPA to a recipient will be assigned a low or moderate security rating, depending on the sensitivity of the information provided.

Applications are not required to attest to these security controls at the time of submission, but awareness of the likely applicability of these security controls and initial coordination with information/security personnel may be appropriate. Whenever possible, BPA will alert applicants to the likely applicability of information security controls required prior to submission of Phase 2. If not known at that time, BPA will inform tentative awardees what level of information security controls may be applied, and discuss any time/cost impacts of meeting such requirements. Phase 2 applications are to provide a detailed description of the BPA data and information specified in the section addressing "Required BPA Furnished Property or Services" of the Vol II - Project Description.

Data rated low under the FIPS 199 (Standards for Security Categorization of Federal Information and Information Systems) requires the recipient to protect all data and information systems under its management and control at all times commensurate with the risk and magnitude of harm that could result to Federal security interests and BPA's missions and programs resulting from a loss or unauthorized disclosure of confidentiality, availability, and integrity of these information or systems. The recipient shall maintain an information security and/or data security plan or program consistent with industry standards such as National Institute of Standards and Technology (NIST), as required by the E-Government Act (Public Law 107-347) of 2002, Title III Federal Information Security Management Act (FISMA). The BPA Chief Information Officer (CIO), or representatives, shall have the right to examine, audit, and reproduce any of the recipient's pertinent information security and/or data security plan or program. The recipient shall adhere to any additional information security requirements identified in the statement of work. The recipient, at its sole expense, shall address and correct any deficiencies and/or noncompliance with the terms of the award as identified by BPA.

Data rated moderate under the FIPS 199, requires the recipient to provide protection of BPA data using the security controls as outlined in NIST 800-53rev4 or the ISO27001:2005/2013 security controls commensurate with a moderate level. This protection must be verified through an independent 3rd party audit/assessment against NIST 800-53rev4 or the ISO27001:2005/2013 security controls. The 3rd party audit/assessment must be completed each year.

The federal government program Federal Risk and Authorization Management Program (FedRAMP) provides a list of auditing organizations that have been certified to conduct these audits/assessments. The list is mentioned as information only and does not limit the use of other auditors.

PART II – AWARD INFORMATION

A. TYPE OF AWARD INSTRUMENT

BPA anticipates awarding cooperative agreements with cost sharing requirements under this announcement. Cooperative agreements permit substantial involvement between BPA and the selected applicants in the performance of the work supported. For the purposes of a BPA Technology Innovation Project (TIP), substantial involvement means:

- BPA does not limit its involvement to the administrative requirements of the BPA funding agreement. Instead, BPA has substantial involvement in the project as a whole.
- BPA requires the recipient to meet or adhere to specific procedural requirements before subsequent stages of a project may continue, e.g., Quarterly Reporting, Requests for Reimbursement, Project Stage Gates.
- BPA will negotiate aspects of the Project Description prior to project start when adjustments would lead to better alignment with BPA's objectives or enhance the probability of project success.
- BPA will review in a timely manner progress reports and proposed changes, recommending alternate approaches if the plans do not address critical programmatic issues or accomplish objectives, and determining whether Stage Gate objectives have been achieved to warrant continued funding.
- BPA may limit recipient discretion with respect to changes in the Principle Investigator/Key Personnel.
- All recipients must present at the TI Summit Review in Q2 and are subject to early termination (see Appendix II for more information)

BPA reserves the sole right to determine the type of award instrument based upon the principal purpose of the award, which includes its primary beneficiary and other key determination factors. Projects selected which are determined to meet the criteria of acquisition contracts rather than cooperative agreements will be awarded subject to the Bonneville Purchasing Instructions. Contracts with Federally Funded Research and Development Centers are addressed in Part III of the announcement.

BPA reserves the right to enter into discussions with applicants for establishing higher cost share requirements or a Cooperative Research and Development Agreement (CRADA) or similar instrument with no BPA cost share. Projects most likely to be affected are those that are primarily focused on incremental improvements of existing software or technologies used by BPA.

B. ESTIMATED FUNDING

$3.0 - 3.5 million is available for new awards under this announcement; however, BPA is under no obligation to award the full amount available.

C. ANTICIPATED NUMBER OF AWARDS AND AWARD SIZE

BPA anticipates multiple awards resulting from this announcement. BPA will fund no more than 50% of total project costs, limited to between $50,000 to $500,000 per project per fiscal year (a minimum dollar for dollar match of BPA's contribution). Projects applying for multiple years of funding will be subject to the same limitation per year. Allowable cost share is identified in Part III. All BPA funds are provided on a cost reimbursement basis only (no profit).

D. FUNDING PERFORMANCE PERIOD

Projects are funded on a fiscal year basis with the first year beginning no sooner than October 1, 2016 and ending no later than September 30, 2017, although actual project start dates may be delayed. Projects for one to three years may be submitted. All projects are subject to stage gates, Period of Performance Clause, Project Renewal Clause (see Part VII) and the annual TI Summit Review and pruning (see Appendix II on TI Summit Week).

PART III – ELIGIBLE APPLICATIONS

A. ELIGIBLE APPLICANTS

All interested parties are eligible to apply under Phase 1 of this announcement.* Respondents may submit multiple Phase 1 applications for different concepts. However, only those submissions determined by BPA to meet the qualifying criteria identified in Part V will be invited, and therefore eligible, to submit full applications under this announcement during Phase 2. BPA supports teaming arrangements if proposed but a Prime Applicant must be identified and letters of commitment should be included from co-applicants.

DOE National Laboratory Contractors and Other Federally Funded Research and Development Center (FFRDC) Contractors

A DOE National Laboratory Contractor / FFRDC Contractor is eligible to apply under this announcement if DOE has granted the entity special authority to submit direct applications or its cognizant contracting officer provides written authorization and this authorization is submitted with the application during Phase 2. If DOE has granted the entity special authority include a narrative describing the special authority and identify a DOE representative for verification. If a DOE National Laboratory Contractor / FFRDC Contractor is selected for award, the proposed work will be authorized using BPA's Inter-Governmental Contract rather than an Interagency Agreement under the Economy Act. BPA is not subject to Federal Acquisition Regulations or the Economy Act. The following wording is acceptable for the authorization:

> "Authorization is granted for the _____________ Laboratory to participate in the proposed project. The work proposed for the laboratory is consistent with or complementary to the missions of the laboratory and will not adversely impact execution of the DOE assigned programs at the laboratory."

DOE National Laboratory Contractor / FFRDC contractors may be proposed as team members on another entity's application. DOE National Laboratory Contractor / FFRDC contractors that are not performing the role of the lead organization are not required to submit any written authorization from the cognizant contracting officer. BPA will not enter into a separate agreement with DOE National Laboratory Contractor / FFRDC contractors proposed as team members. BPA will enter into a single agreement with the lead organization/prime applicant.

**Recipients and subrecipients will be excluded from further consideration if they have Active Exclusions noted in the System for Award Management at www.sam.gov.*

B. COST SHARING

BPA requires a minimum 50% cost share (of the total project) per year for all projects submitted with a maximum BPA contribution of $500,000 per project per fiscal year (e.g. $500,000 of BPA funds must be matched by $500,000 of cost share, $1,000,000 total project). Cost share shall be expended at the same rate as BPA spending unless written approval is provided. The cost share may be from one or multiple sources. Project funding may be cash or in-kind contribution to the work.

When calculating the amount of the non-BPA contribution, the Financial Assistance Officer may approve the following costs as allowable in accordance with the applicable cost principles:

(a) Cash;
(b) Personnel costs (in-kind labor not considered cash);
(c) The value of a service (w/out profit), other resource, or third party in-kind contribution determined in accordance with the applicable circular of the Office of Management and Budget;
(d) Indirect costs or facilities and administrative costs; or
(e) Other appropriated Federal funds provided they are used in accordance with their appropriation, e.g., Federal Grants with a similar purpose. Federal funds may be used as cost share.

The Financial Assistance Officer will not allow:

(a) Revenues or royalties from the prospective operation of an activity beyond the project length;
(b) Software licenses provided by the prime recipient;
(c) Unrecognized profit;
(d) Any costs contributed prior to the execution date of the agreement; or
(e) Proceeds from the prospective sale of an asset of an activity.

All in-kind cost share must be provided in sufficient detail to allow determination of reasonableness and allowability, e.g., hourly rates, number of hours, pro-rated amounts for donated equipment, etc. BPA will apply cost principles applicable to Educational Institutions, State Local and Indian Tribal Governments, and Non-Profit Organizations via Uniform Guidance at 2 CFR Part 200. For commercial organizations, BPA will apply the Bonneville Purchasing Instructions (BPI), Appendix 13-A, Contract Cost Principles for Commercial Organizations. The BPI is located at http://www.bpa.gov/corporate/business/bpi/.

All cost sharing shall be fully auditable and verifiable and is subject to BPA acceptance. Cost share commitments shall be verified by BPA within thirty days of the award notice. Examples of acceptable verification include letters of commitment signed by a party authorized to obligate the co-funder and copies of official funding agreements. Cost share documentation must include sufficient detail to determine reasonability of the amount (e.g. # of hours, hourly rates, equipment values, etc…) and planned use of the cost share. If in-kind, the cost share services should be documented on worksheet “f. Contractual” of the Budget Workbook – Vol III and also on the “i. Cost Share” worksheet for the corresponding amount and type. If cash or equipment is being provided, the use should be documented in the appropriate tab (travel, equipment, contractual) and also in the “i. Cost Share” worksheet. All cost share other than cash should be identified in tabs a-h.

C. FOREIGN NATIONAL REQUIREMENTS

All applicants and project participants must have a valid US citizenship or a valid visa. Individuals with expired Visa’s are not eligible to apply to this announcement or participate as a project team member.

The BPA Security Office must approve all Foreign National project participants. No Foreign Nationals will be allowed to begin work with BPA or be on a BPA site until their Foreign National request has been approved. Identify all Foreign Nationals assigned to the project in Phase 2 of the application. All Foreign National project participants will be required to complete blocks 3-7 on form BPA F 5632.08e upon notification of the project being selected for funding but prior to project award. The form is located on the BPA Exchange. The BPA Host will complete the remaining blocks on the form and submit to BPA Security for review. This process may take up to 120 days depending on the country of origin.

If any portion of the Contractor’s maintenance or support service is located in a foreign country, then the Contractor will disclose those foreign countries to BPA to determine if the foreign country is on the Sensitive Country List or is a Terrorist Country as determined by the United States Department of State. BPA will notify the Contractor in writing whether or not it can allow an intangible export of BPA’s Critical Information or if a Deemed Export License is required.

The Contractor shall notify the CO in writing in advance of any consultation with a foreign national or other third party that would expose them to BPA Critical Information. BPA will approve or reject consultation with the third party.

The Contractor shall immediately notify BPA’s Office of the Chief Information Officer (OCIO) Chief Information Security Officer (CISO) of any security incident and cooperate with BPA in investigating and resolving the security incident. In the event of a security incident, the Contractor shall notify the CISO by telephone at 503-230-5088 and ask for a Cyber Security Officer. BPA may also provide in writing to the Contractor alternate phone numbers for contacting Cyber Security Officers. A call back voice message may be left but not the details of the Security Incident.

PART IV – APPLICATIONS AND SUBMISSION INFORMATION

A. SUBMISSION REQUIREMENTS

This announcement is composed of two phases with all relevant dates listed on the cover page. The requirements for both phases are addressed in this Part. It is critical potential applicants carefully review these requirements, as incomplete applications may be denied further consideration. Phase 1 submittals should clearly demonstrate how their project application is aligned with the BPA Focus Area and/or Technology Roadmap(s), e.g., technology characteristic, capability gap and/or drivers with page references. Applications will be evaluated based upon the criteria in Part V of this announcement. BPA will notify each Phase 1 applicant of the results of this evaluation. Those applicants determined to meet the identified criteria will be invited to submit a full application under Phase 2.

B. PHASE 1 CONTENT

This section contains the instructions for Phase 1 of this announcement. If more than one Phase 1 application is submitted by the same applicant, each application shall contain all the information required by this opportunity announcement to be considered responsive. Phase 1 applications should provide all the requirements below included in two documents (Microsoft Word or Adobe Portable Document Format), one for sections B.1, B.2, and B.3, and one document for B.4 Qualifications and References. Applicants must fill out all requested information in BPA Exchange when submitting a project application regardless of duplication within their submission.

B.1 CONCEPT PAPER

The Concept Paper must address the following items:

- Project description and list of major objectives (one page maximum).
- Describe how your proposal is tied to the BPA Focus area and/or Technology Roadmaps (including addendum and appendixes) as identified by specified key roadmap components. The technology roadmaps can be found at www.bpa.gov/ti. Identify the specified key roadmap components that your proposal addresses, include the individual roadmap titles and page numbers, and describe how the project will result in needed technology characteristics and fill capability gaps identified in the roadmap(s). (three pages maximum).
- The Technology Readiness Level (TRL) at project start and project finish should be provided, with brief explanation. Refer to Appendix IV for TRL guidance. (one page maximum).

B.2 SUMMARY OF THE WORK PLAN

Explain how the work will be performed (three pages maximum).

B.3 COST SHARE/BUDGET

Describe how the recipient intends to address the required 50% minimum cost-share for the project, including actual funding secured or potential sources of funding. If funding commitments have been secured, the applicant may describe this using percentage of project that is already funded. Cost estimates should be provided in the online application; however, applicants will have the opportunity to update these figures during Phase 2. Phase I Budget may only be submitted in Excel using the Budget Workbook included with this announcement.

B.4 STATEMENT OF QUALIFICATIONS & REFERENCES – Separate Document

1. Qualifications & Experience – Key Personnel

Key Personnel - List the principal investigator(s), organization project leaders, partners, and participants. Describe what they bring to the project and their knowledge, skills and experience as related to the project. Applicants should include a resume for all key personnel including each Principal Investigator and major project participant. Resume should include abilities, skills, qualifications, and specialized experience relevant to the type of work proposed (include credentials, educational background and years of experience).

<u>Principal Investigator(s) and Project Team Members</u>

- Identify the Principal Investigator(s) and other key personnel necessary to complete this project (projects will not be allowed to replace a Principal Investigator without written authorization). Include email, phone number and citizenship for all proposed project team members. This includes the prime participant organization and any sub-contracts.
- Describe the time commitment for the Principal Investigator(s) and other key project personnel and/or positions as a percentage of a full time employee (FTE)
- Identify contacts and references (name, title, address, telephone, and fax numbers) knowledgeable of the Principal Investigator(s) and other key personnel's previous technology experience related to the project.
- Include a brief description of the direct technology and other relevant experience of the Principal Investigator(s) and other key personnel for their responsibility areas.

<u>Organization(s)</u>

- Identify the organizations and personnel responsible for implementing the project. Identify the project manager, his/her tenure, and scope of responsibility. If multiple parties will perform the work describe the relationship between the parties (contractual, partnership, consortium, etc.).
- Letters of commitment should be including if a teaming arrangement is anticipated.
- Identify the credentials of organization/staff to support the application
- Identify the management structure and key managers who will be responsible for the technical work areas.
- Describe the adequacy of the proposed facilities to conduct and support development of any necessary field-testing activities.
- Provide pertinent examples of experience working with utility companies or federal agencies related to the technology area being studied within the last five years.

Partner(s)/Participants/Vendors

- Identify the consultants and contractors you expect to use on the project.
- Discuss any known and planned relationships with other utilities, developers, vendors, subsidiaries and others that will participate in the planning, development or operational phases of the project. This does not include ad-hoc project consultants or contractors.

2. References

List three references for projects of similar scope and complexity that were completed by the Applicant. Include a brief summary of the project along with the names, telephone numbers, and email addresses of contact persons from the agencies or organizations that sponsored the project.

NOTE: The Statement of Qualifications and References must be re-submitted with any updates for Phase 2. This ensures that BPA has the most up to date information in one place for evaluators to use.

B.6 MULTIPLE CONCEPT SUBMISSIONS

Each response to Phase 1 submitted shall address only one project. Applicants with multiple projects should submit a separate application for each.

C. PHASE 2 CONTENT

If invited, Phase 2 applications shall include all the required documentation below.

C.1 INTRODUCTION

This section contains the instructions for preparing the Full Application. If more than one application is submitted by the same applicant, each application shall be submitted and contain all the information required by this opportunity announcement in order to be responsive. This opportunity announcement prescribes a specific format for the Application to facilitate preparation and evaluation. Applicants may include additional material in the application only if it is necessary for clarification. Elaborate applications, lengthy discussions, and non-critical attachments are discouraged.

C.2 APPLICATION DETAILS AND FORMAT

The application shall present the applicant's plans for the project based on the concepts provided in Phase 1 format above, the details requested below, and how the applicant expects the project to proceed.

The application must be organized and provide the information in the sequence presented below. Sections must be numbered and identified as provided in this part. Additional subsections may be used if such usage enhances the applicant's ability to describe the work. If a required item is not known or is not applicable, applicants shall state this in the applicable section of the application. Relevant documents may be cited by reference. Copies of references cited are not expected to be included as part of the application. BPA reserves the right to request copies of references cited. If the application contains "trade secrets" as defined by 18 U.S.C. § 1839 Applicant shall mark each page containing such information. Applicants are advised to restrict the inclusion of trade secrets in the application to the minimal amount of information necessary to support BPA's evaluation.

C.3 FULL APPLICATIONS SHALL INCLUDE THE FOLLOWING:

Applicants must fill out all requested information in the website application process regardless of duplication with their submission.

Applications are required to submit a separate document for each of the following volumes in Word, Adobe Portable Document Format, or Excel as appropriate. Please be advised that if selected, the applicant must provide Volume II – Project Description, in Word format, as BPA intends to incorporate the Project Description into the resulting award document. Volume III – Budget may only be submitted in Excel using the Budget Workbook included with this announcement.

Each Project Application shall include the following outlined sections. Each section is described in more detail following this outline.

1. Volume I: Technical Proposal
    a. Cover page
    b. Describe the following:
        i. Summary description of the proposed project
        ii. How the project is aligned with the BPA Focus Area and Technology Roadmap(s) as identified by the specified R&D program(s).
        iii. The risk to BPA of not doing the project
        iv. The work already being done in the R&D community that is related to the project
        v. How the project's results can be applied
        vi. How the project will benefit BPA and the costs of doing the project
        vii. The potential environmental impacts (of the project itself)
        viii. Describe any required BPA furnished property or services to include level of effort BPA is required to provide to the project (regarding requests for BPA system data or models, provide as much detail as possible so that BPA can determine the sensitivity rating of the data)
        ix. Technology Readiness Level (refer to Appendix IX)
        x. Any additional information,

2. Volume II: Project Description (Statement of Work)
    a. Cover and title page
    b. Provide a detailed Project Description (Refer to Appendix III for template and instructions)

3. Volume III: Cost Share and Budget

4. Volume IV: Statement of Qualifications & References

5. Volume V: Project Benefit Form

C.3.1 DETAIL

1. <u>Volume I – Technical Proposal</u>

The Technical Proposal will be used to assess both the scientific merit of the proposed work and its relevance to BPA's Focus Area and/or Roadmaps (including addendum and appendixes). The technical proposal must be self-contained and written in a clear and concise manner. The proposal shall be definitive with respect to the research and development which the applicant actually proposes to conduct.

1.a <u>Cover Page</u>
Show the name of the project, organization name, date of the application, the person responsible for the application preparation, and all key technical partners to the project. The cover shall include the legend "Technical Proposal for Evaluation Purposes by or on behalf of the Bonneville Power Administration."

Clearly show that this is Volume I: Technical Proposal on the cover page and it the saved document title (e.g. Company_Vol_I_TechProposal.doc). The header/footer should include the control # and page #.

1.b Technical Proposal: As listed above the Technical Proposal shall provide the following:

i. Summarize the proposed project. This should be a short paragraph of approximately three or four sentences.

ii. Describe how your proposal is tied to the BPA Focus area and/or Technology Roadmaps (including addendum and appendixes) as identified by specified key roadmap components. The technology roadmaps can be found at www.bpa.gov/ti. Identify the specified key roadmap components that your proposal addresses, include the individual roadmap titles and page numbers, and describe how the project will result in needed technology characteristics and fill capability gaps identified in the roadmap(s).

iii. The impact or unmitigated risk to BPA of not doing this project, the probability of success and technical risks of the project.

iv. Any related work already being done in the R&D community that is related to this project. How this project improves, advances, changes, or is somehow different than what is being or has already been done.

v. Where and how this project's results can be applied. Is there something being used today that will benefit from this project? Is there a past use that can be put to better use because of this project? Is there an indirect benefit that should be noted? Does the project have near or future term application? If it is not applicable to BPA's system, explain why and why it would be important for BPA to fund it.

vi. How this project will benefit BPA. Describe the qualitative benefits to BPA. Quantify the benefit and estimate the cost of doing the project. Describe the assumptions and any calculations for these estimates. Describe whether the costs and benefits are quantifiable or not. If they cannot be quantified, describe why not.

vii. Describe the potential environmental impacts from the construction, operation, and implementation of the proposed project, including project-specific impacts (rather than general impacts) that may result from facilities footprints, demonstration or implementation phases, and construction activities, e.g., ground disturbance, wetlands impacts, water usage. List any permits that may be required from state, local, and federal permitting authorities. Please note that construction, operation, and implementation is contingent upon BPA's completion of environmental review as required by the National Environmental Policy Act (NEPA) and applicable environmental statutes.

viii. Describe the level of effort the applicant is requesting from BPA in support of the project. Specifically identify any BPA furnished data, services, or materials that are essential to the performance of the project. Regarding requests for BPA system data or models, provide as much detail as possible so that BPA can determine the sensitivity rating of the data. Identify the key tasks or phases in the project where the applicant believes BPA participation is essential. Applicants are advised that BPA's labor contribution to the project may be limited. BPA does not make any guarantees that BPA will contribute labor to the project.

ix. Technology Readiness Level (TRL) – Explain what the TRL is at the start of the project and the anticipated TRL at completion. Include sufficient evidence to justify the TRLs. Evidence could include documents, research papers, current or previous research projects, and an example of pilot, demonstration or full application in other organizations. Provide Refer to Appendix IV for a description of each of the levels. The TRL numbers are also required to be entered into the announcement website.

x. Provide any additional information, with appropriate headings, that will help describe the project and plans.

2. Volume II – Project Description (Statement of Work)

Note: Please be advised that if selected the applicant must provide Volume II in Word Format as BPA intends to incorporate the Project Description into the resulting award document.

1.a Cover Page
Show the name of the project, organization name, date of the application, the person responsible for the application preparation, and all co-sponsors currently in the project. The cover shall include the legend "Technical Proposal for Evaluation Purposes by or on behalf of the Bonneville Power Administration."

Clearly show that this is Volume II: Project Description on cover page and in the saved document title (e.g. Company_Vol_II_ProjDescription.doc). The header/footer should include the control # and page #.

2.b Project Description
Follow BPA guidelines for proposed Project Description (see Appendix III for template and instructions). All applications must contain a detailed Project Description that describes the project's objectives, addresses how the project work will be conducted, and how the objectives will be achieved. This is similar to a Statement of Work and should be written as a standalone document that can serve as the applicant's work proposal for the project. BPA intends to incorporate the applicant's proposed Project Description into the resulting Cooperative Agreement or other award instrument.

3. Volume III – Cost Share and Budget (Budget Workbook – Microsoft Excel)

Applicants are required to complete the BPA Budget Workbook provided with the announcement in Microsoft Excel and upload with their application titled: Company_Vol_III_Budget.xlsx. No other submission for Volume III is required at this time. The Budget Workbook should be followed according the instructions on each tab. Detailed costs should be reflected without profit, and fully broken out between actual labor rates, fringe benefits, indirect costs, equipment, etc…The total budget for the project (BPA and Recipient shares) should be reflected in tabs "a" through "h" including in-kind work/contributions. The cost share tab should then be completed to effectively reduce the amount of project funds required to be contributed by BPA. The SF424 tab would then accurately reflect this distribution.

Cost share commitment letters must be provided within 30 days of tentative award and Fringe/Indirect Rate Proposals are required within 14 days if you do not have a federally approved rate. Cost share commitment letters along with Fringe/Indirect Rate Proposals on hand at the time of Phase II submission can be included as an addendum to Vol III.

4. Volume IV: Statement of Qualifications & References

The information submitted during Phase 1 (Part IV-B.4) must be re-submitted as Volume IV. This can be updated between Phase 1 and 2. The attachment should be titled similar to: Company_Vol_IV_Qualifications.doc.

5. Volume V: Project Benefit Form

Applicants are required to submit a completed project benefit form, included with the announcement on BPA Exchange as attachment V. The volume should be attached with the application titled: Company_Vol_V_ProjectBenefit.doc. As reference, an example of a completed project benefit form is included in the announcement on BPA Exchange as attachment EXAMPLE Project Benefit Form.

PART V – EVALUATION INFORMATION

A. CRITERIA FOR PHASE 1

The Phase 1 application will be evaluated individually based on the response to BPA's requirements and the evaluation criteria. Phase 1 submittals will not be evaluated against each other. BPA reserves the right to utilize third party consultants in the review of Phase 1. BPA is solely responsible for any decisions made pursuant to this phase, including the determination of the applicant's capability to bring the proposed idea to a successful conclusion and the relative technical and schedule risks for the project. Applicants will be notified of the decision by BPA of whether they can proceed to Phase 2. Phase 1 submittals will be evaluated using the following criteria, listed in descending order of importance:

a. Relevance of the proposed project to the identified BPA Focus Area and/or Technology Roadmaps (including addendum and appendixes);

b. Principal investigator and project team qualifications including technical expertise, capabilities, related experience, and previous project successes, as well as the resources, facilities, techniques and/or unique combinations of these which are integral factors for achieving the application objectives;

c. Probability of achieving the 50 percent cost-share requirement; and,

d. Clarity, quality, and organization of the Phase 1 application.

Based on the above evaluation criteria, the Phase 1 application will either be determined to be:

Non-compliant – Phase 1 application does not meet one or more of the minimum evaluation criteria. The respondent is not invited to submit a Phase 2 application.

Encouraged – Phase 1 application satisfies the requirements. The respondent is encouraged to submit a Phase 2 application.

Discouraged – Phase 1 application meets the minimum requirements, however it lacks sufficient detail to successfully compete in Phase 2. The respondent is discouraged to submit a Phase 2 application without addressing the concern(s) identified from the phase 1 evaluation.

B. CRITERIA FOR PHASE 2

Application Evaluation Process

Applications will be reviewed by the Financial Assistance Officer to determine responsiveness to the application requirements provided in the announcement. These requirements include submission of all required documents and meeting the 50% minimum cost share. Responsive applications will proceed to the next level of evaluation. Non-responsive applications will not be given any further consideration for award.

Responsive applications will then be reviewed and evaluated by an evaluation panel composed of BPA staff and third party subject matter experts. Qualified subject matter experts are used at BPA's sole discretion and are required to sign non-disclosure agreements and certify that they do not have a conflict of interest in participating in the evaluation of each application along with internal evaluators.

The application will be evaluated across several criteria. BPA applies a portfolio model to manage its technology innovation projects. Under this portfolio model, BPA's goal is to have a balance of projects in its Technology Innovation Portfolio across various technologies, time horizons, risk/reward profiles, cost concerns, and other needs. Highly ranked applications will be considered for inclusion in the BPA Technology Innovation Portfolio. Portfolio decisions are more complex than a technical review of a project taken in isolation. The decision to include a project in the Technology Innovation Portfolio includes consideration of the project risk/benefit profiles, the need to address the Roadmap, a balance of projects, ability to commit resources, a balance of time horizons and other factors.

Applicants are advised that an application for a project on a subject matter that is not currently included in BPA's TI portfolio may stand a better chance of selection for award compared to another application on a subject matter that is already well represented in the portfolio. Portfolio funding decisions are based in part on the information provided in the application. BPA reserves the right to consider other information from any source, including past performance information, for all project participants. BPA may request an oral project presentation after Phase 2. Applicants will be contacted if this is required.

Proposal Evaluation Criteria

No.	Criteria	Description	BPA Objective
1	Project strength within BPA's existing portfolio	The degree to which the project strengthens BPA's existing portfolio of projects	The right portfolio
2	Technology Roadmap	The degree to which project scope addresses the R&D Program(s) identified in the Technology Roadmap(s)	The right research
3	Flexible Operation Focus Area	The degree to which the project scope addresses the Flexible Operation focus area	The right focus
4	Project Resources	The degree to which the team members have sufficient experience and are qualified to carry out the project	The right mix of talent
5	Technical Success	The probability of the project being a technical success	Achieving successful project results
6	Successful Application to BPA	The probability of near or long term successful application to BPA	Successful application to BPA business challenges
7	Magnitude of Expected Benefit	The quantitative or qualitative expected benefits as applied system wide, assuming this project is a technical success	Magnitude of benefits to BPA and Pacific Northwest commensurate with risks
8	Stage Gates	The degree to which proposed Stage Gates (go/stop decision points) reflect real options/choices for project decisions, <u>and</u> relate to real discovery/science/achievement thresholds	The right decision points
9	Cost Share Requirement	Cost share which exceeds the minimum requirement, e.g. greater than 50%	The degree of mutual commitment to success
10	Cash Cost Share Contribution	The percentage of cost share which is a cash contribution	The degree of mutual commitment to success

The application evaluation panel may determine that additional information is needed to fully evaluate an application. The Financial Assistance Officer will identify additional information required and the format for the information. BPA may request written information, conduct telephone discussions or use any other means at BPA's sole discretion.

PART VI – QUESTIONS AND CONFERENCE

A. QUESTIONS

Applicants may submit questions regarding the announcement in **writing** via email to Karen Wolfe, Financial Assistance Officer, at any time. Answers that are not readily apparent by reading this announcement will be posted to the BPA Exchange weekly in the Question and Answer section, sortable by Non-FOA related and specific to BPA-0003602. Any required changes to the announcement will be posted as an amendment.

Questions provided prior to the pre-application conference (see below) will be addressed at the conference and should be submitted via e-mail no later than 4:00 PM PST, March 9, 2016. In the subject line of your email, please reference "FY17 TI Funding Opportunity Conference Questions." These questions will be answered during the conference noted below as well as posted on BPA Exchange after the conference.

B. CONTACT

Name:	Karen Wolfe
Email:	ktwolfe@bpa.gov
Telephone:	503-230-3448

C. PRE-APPLICATION CONFERENCE CALL

BPA will hold a conference call to review Phase 1 and Phase 2 content, instructions, and the evaluation process as stated in this announcement. Attendance is not required and any topics discussed will be posted to the BPA Funding Opportunity Exchange website for review by all interested applicants.

The conference will be held via WebEx on March 10, 2016 from 1:00 PM to 2:30 PM PST. A call-in phone number and WebEx instructions for the conference will be provided upon written request. Please provide an email notice of your intent to participate to Karen Wolfe, Financial Assistance Officer at ktwolfe@bpa.gov, no later than 4:00 PM PST, March 8, 2016. In the subject line of the email, reference "FY17 TI Funding Opportunity Conference." In the notice, please identify your organization or firm, the participants and e-mail addresses associated with those requiring access.

D. TECHINCAL QUESTIONS/CONFERENCE

BPA may hold technical Question and Answer sessions should the number and breadth of questions not be easily answered via posted answers on BPA Exchange. These would allow for specific roadmap related questions regarding R&D efforts of interest to applicants. Notice of any Technical Q&A sessions by roadmap or specific topic area will be posted on BPA Exchange along with this announcement.

PART VII – TERMS AND CONDITIONS

Terms and conditions for Cooperative Agreements or Contracts will be provided following selection of apparent awardees. Specific terms and conditions will be reviewed and negotiated at that time. Agreements will be awarded consistent with the Bonneville Financial Assistance Instructions (BFAI). Contracts are subject to the Bonneville Purchasing Instructions (BPI). The BFAI and BPI may be downloaded from the BPA website www.bpa.gov by selected "Doing Business."

Draft R&D Cooperative Agreement Terms and Conditions are available with FOA#: BPA-0003602 on BPA Exchange: https://bpa-exchange.energy.gov/

PART VIII – DEFINITIONS/ACRONYMS

"Applicant" means an entity that files a written application for financial assistance with BPA or with a recipient, i.e., for a subaward.

"Application" means a written document from an applicant that contains details of the project or program for which they are seeking BPA's financial assistance and support.

"Award" means the written instrument executed by a BPA Financial Assistance Officer (FAO) after an application is approved, which contains the terms and conditions for providing financial assistance to the recipient. "Award" can refer to any of the specific instruments referred to in the BFAI. An award authorizes funds for a specific project.

"BFAI" means Bonneville Financial Assistance Instructions.

"BPA" means Bonneville Power Administration

"BPI" means the Bonneville Purchasing Instructions.

"Contract" means a legal instrument reflecting an agreement between BPA and a contractor whenever the principal purpose of the instrument is the acquisition by purchase or lease of goods or services for the direct use or benefit of BPA.

"Cooperative agreement" means a legal instrument reflecting a relationship between BPA and a State or local government or other recipient whenever:

(1) the principal purpose of the relationship is the transfer of money, property, services, or anything of value to the State, local government, tribe or other recipient to accomplish a public purpose of support or stimulation authorized by Federal statute, rather than acquisition, by purchase, lease, or barter, of property or services for the direct benefit or use of BPA; and,

(2) substantial involvement is anticipated between BPA and the State, local government, tribe or other recipient during performance of the activity. (31 U.S.C. 6305)

"Cooperative Research and Development Agreements" (CRADA) is when a partner and BPA intend to collaborate on a project. It protects a company's and BPA's existing intellectual property, and allows the company to negotiate for an exclusive field-of-use license to subject inventions that arise during the CRADA's execution, and BPA to maintain license rights to those inventions. The primary type is that of Shared Resources: A joint research project between BPA and a partner to develop, advance, or commercialize BPA-developed or BPU utilized technology without funds changing hands.

"Federal Information Security Management Act of 2002 (FISMA)" is a United States federal law enacted in 2002 as Title III of the E-Government Act of 2002 (Pub.L. 107–347, 116 Stat. 2899). The act requires each federal agency to develop, document, and implement an agency-wide program to provide information security for the information and information systems that support the operations and assets of the agency, including those provided or managed by another agency, contractor, or other source.

"FCRPS" means the Federal Columbia River Power System.

"Field Representative" or "FR" means the individual who has been delegated responsibility by the Financial Assistance Official (FAO) for inspecting the project for compliance with plans and specifications. The field representative is not authorized to make changes to the award, direct the recipient to take specific actions, issue stop or resume work orders. Field representatives work under the direct supervision of the FAO and Project Technical Representative (PTR).

"Financial assistance" means any form of assistance instrument where the principal purpose of the relationship is the transfer of money, property, services or anything of value to a recipient in order to accomplish a public purpose of support or stimulation authorized by Federal statute rather than of acquisition, by purchase, lease, or barter, of property or services for the direct benefit or use of BPA. Specific types of financial assistance instruments include, but are not limited to, grants, cooperative agreements, and loans.

"Financial Assistance Officer" (FAO) means a BPA employee who possesses the delegated authority to obligate BPA funds through the use of financial assistance instruments.

"Financial Assistance Officer's Representative" or "FAOR" means the individual designated by the FAO to perform administrative work connected with the award.

"Financial Status Report" (FSR) means a periodic report regularly provided to the FAO or PTR to enable supervision of the recipient's project implementation and success.

FISMA means Federal Information Security Management Act of 2002 "FY" means Fiscal Year. BPA's fiscal years begins October 1^{st} and continues until September 30^{th} of the following year.

"Gap" means a utility need that is not met today or will not be met in the future with the technology currently in service.

"Government" means a State or local government or a federally-recognized Indian Tribal Government.

"Grant" means a legal instrument reflecting a relationship between BPA and a State or local government or other recipient whenever:

(1) the principal purpose of the relationship is the transfer of money, property, services, or anything of value to the State, local government, tribe or other recipient in order to accomplish a public purpose of support or stimulation authorized by Federal statute, rather than acquisition, by purchase, lease, or barter, of property or services for the direct benefit or use of BPA; and,

(2) no substantial involvement is anticipated between BPA and the State, local government, tribe or other recipient during performance of the contemplated activity (31 U.S.C. 6304).

"Grantee." See Recipient.

"Local government" means a county, municipality, city, town, township, local public authority, school district, special district, intrastate district, council of government (whether or not incorporated as a nonprofit corporation under state law), any other regional or interstate government entity, or any agency or instrumentality of a local government.

"Negotiation" means the process through which BPA and the applicant establish mutual agreement as to project purpose, definition, timing, BPA's role in the project, and the resources appropriate to support and carry out the project.

"PNW" means the "Pacific Northwest" (as defined by the Northwest Power Act, 16 U.S.C. § 839a(14)) section 3(14), "the area consisting of the states of Oregon, Washington, and Idaho, the portion of the State of Montana west of the Continental Divide, and such portions of the States of Nevada, Utah, and Wyoming as are within the Columbia River drainage basin and any contiguous areas, not in excess of seventy-five air miles from the area referred to in (the Act), which are a part of the service area of a rural electric cooperative customer served by the (BPA) Administrator."

"Participant" means a non-Federal party which receives financial assistance by means of a cooperative agreement. At BPA, the term "recipient" is used in lieu of "participant."

"Principal Investigator" means a person designated by the recipient in the award document as necessary to understand the goals of the project, direct and manage the project, and whose participation is required for successful completion of the project.

"Program Office" means the office that determines major program goals and policies, and allocates funds, personnel, and other resources among the programs for which it is responsible, and determines other major facets of the financial assistance effort.

"Project Technical Representative" or "PTR" means the individual designated by the FAO to perform technical award administration activities on behalf of the FAO within limits specified by the FAO.

"R&D" means Research and Development investigations in the following areas:

- Basic Research - research directed toward increasing knowledge in science. The primary aim of basic research is to develop a more complete understanding of the subject under study.
- Applied Research – is the effort that normally follows basic research. It attempts to determine and exploit the potential of scientific discoveries or improvements in technology, materials, processes, methods, devices or techniques. It attempts to advance the state of the art.
- Advanced Development - all effort directed toward projects that have moved into development of hardware for test. The prime result of this type of effort is proof of design concept rather than the development of hardware for service use.
- Demonstration – field tests

"Recipient" means the organization that receives a financial assistance award from BPA and is financially accountable for the use of any BPA funds or property provided for the performance of the project, and is legally responsible for carrying out the terms and conditions of the award.

"Stage Gate" means a critical GO/STOP decision point. It occurs at least once within a fiscal year. Its occurrence is based upon the essential performance elements that have to happen for the rest of the project to be worth doing and before the project can go any further (see Appendix II for further details).

"State" means any of the several States of the United States, the District of Columbia, the Commonwealth of Puerto Rico, any territory or possession of the United States, or any agency or instrumentality of a State exclusive of local governments.

APPENDIX I – BUDGET WORKBOOK INFORMATION

The Microsoft Excel Budget Workbook for Volume III is attached with the FOA (BPA-0003602) on BPA Exchange: https://bpa-exchange.energy.gov/. Each worksheet must be filled out in its entirety including all cost share. A separate Workbook Guidance document is included should additional questions arise.

APPENDIX II – STAGE GATE GUIDANCE

Definition
Stage Gates are decision points for deciding whether the project should go ahead or be stopped. Stage gates occur at least once before the end of a project. Its occurrence is based upon the essential performance elements that have to happen for the rest of the project to be worth doing and before the project can go any further.

Guidance

1. Every project has to have at least two stage gates during each fiscal year. This is in addition to the requirement of presenting project status during the Technology Innovation Summit Week (described below). **Ideally, a stage gate does not happen concurrent with the Summit Event.**

2. Have the riskiest sorts of project elements done early in the project life.

3. The project proposer should view the whole project and determine if there are critical elements that can be done early. It's important to know early in the project life whether or not there are any "show stoppers." Fail early – fail cheap.

4. The stage gate review process is performed by members of the project team including the Financial Assistance Officer/Project Technical Representative (Contracting Officer/Contracting Officer's Technical Representative for contracts), project manager, subject matter expert, and Technology Innovation Project Management Officer. At a minimum the Project Technical Representative (or Contracting Officer's Technical Representative), Project Manager, and Project Management Officer should be involved in the stage gate review and decision. Criteria should be designed to answer salient questions such as:

   - Have critical technical milestones been met?
   - Is project on time and within budget?
   - Does the concept still have potential to provide the anticipated benefits?

5. Each gate requires quantitative and/or qualitative criteria. For example:

   - If project Task 1 does not meet a specific testing specifications then the probability of <u>not</u> being able to design product feature "A" quadruples. This puts the project at an unacceptable risk; therefore the best business decision is to stop the project.
   - During Phase 1 an environmental assessment proved to be in conflict with the BPA need to provide value to the region, therefore the project was stopped.
   - Before performing a detailed design of the demonstration project, a feasibility study was conducted to determine the material costs. The study learned that certain materials were in extreme short supply causing the preliminary estimates of the material costs to be severely conservative. The newly revised costs resulted in a negative cost/benefit. The project was stopped.

<u>Technology Innovation Summit Week</u>

In addition to the stage gate decision points, project progress is evaluated during the Technology Innovation Summit Week. Like a stage gate, decisions about whether the project should move forward or be terminated are also made at this time. The TI Summit Week occurs during the second FY quarter (late Jan. or early Feb.).

This allows the project sufficient time to gain traction, meet deliverables, and provide a project progress report. During the week, project presentations are provided by the principal investigators and should include project status, issues, next steps, financial status, etc. The recipient should include associated travel costs into the project budget. Presentation templates and instructions will be provided after award but applicants should build in adequate time to prepare a thorough presentation, provide drafts, and collaborate with BPA prior to presenting; typically presentations are due within 3 weeks of the Summit event. This allows sufficient time for the Technology Confirmation/Innovation Council to review Summit related documents.

Presentations will be made to the Technology Confirmation/Innovation Council who performs this annual review of funded projects and makes decisions about continued funding and project support. Projects may be terminated at this time if they are determined to not be performing adequately. Termination considerations may also include portfolio balancing, relative benefit to BPA, and/or a need to reduce fiscal year spending and may not necessarily imply poor project performance. For example, a project that is otherwise performing well may still be terminated as a result of the Summit evaluation. Recipients whose projects are identified as being terminated will be notified shortly after the Summit. Works under these projects are to stop within 30 days of the termination notice.

Prior to submitting an application, Applicants are encouraged to assess the risk and implications of the possibility of having a project terminated during the course of the project.

APPENDIX III – PROJECT DESCRIPTION CONTENTS

The Applicant's Project Description shall address each of the following topics generally in the sequence presented below. All tasks and deliverables anticipated to be accomplished in future fiscal years should be clearly marked as such. Budgets and work will be approved per fiscal year.

1. Goal and Scope of this Agreement

The general objective and goal of the agreement should be outlined in a few brief sentences. This section includes the technology area to be investigated, objectives/goals, and major milestones for the effort. Provide a brief overview of the technology development effort and describe why it is being pursued, what is intended to be accomplished, and what aspect of the BPA Focus Area and/or Technology Roadmap(s) (e.g. which product/service area, individual roadmap title(s)) is being addressed.

2. Background

This section includes any information, explanations, or constraints that are necessary in order to understand the technical requirements presented in the Project Description. It may include techniques previously tried and found ineffective.

3. Location of Project (required only if work is site-specific)

The location of the project should be described. For example, "This project will be performed in the BPA service area of the Pacific Northwest," "This project will be performed at BPA Headquarters in Portland, Oregon," or a similar statement. If available, maps depicting possible site-specific project locations should be included with the application.

4. BPA-Furnished Property, Information or Services (As proposed by the Applicant and to be approved by BPA)

Indicates the nature and extent of property, system data, models or services to be provided to the applicant by BPA in support of this agreement. Describe the format in which any data is transferred to BPA. Provide as much detail as possible so that BPA can determine the level of effort required to assist the project and determine the sensitivity rating of the data.

Also provide the location at which the property, data, or services will be delivered to the applicant, and the date and time it will be provided, in the format below:

Description	Point of Delivery	Date

5. Recipient-Furnished Property or Service

The recipient is required to provide all property and services in support of this agreement, except those mentioned under Section 4 above. *In addition to physical property, include a listing of any proprietary data and software to be used on the project, as well as any patent applications related to the subject of the project*. The main purpose of this section is to point out major property or services which may be unique in nature.

6. Definitions and Acronyms

New terms or acronyms within the project description, particularly those of a specialized or technical nature, should be defined in this section. It is not necessary to define such common terms as BPA, Regional Act, etc.

7. Documentation

Specifications and standards (either Federal or industry-wide) which are to be used in the performance of the project are listed here, for incorporation by reference into the agreement.

8. General Requirements

A one paragraph description of the general requirements to be accomplished in this agreement should be provided here, expanding on the description in Section 1 above. A clear statement of the tasks to be performed in reaching these objectives.

9. Technical Exhibits

Voluminous and detailed data required to provide BPA with sufficient information to evaluate the Project Description should be appended as exhibits.

10. Specific Requirements

Describe the area of investigation or research required in performing the identified tasks.

The specific steps or activities to be accomplished by the recipient which will address the TI Funding Opportunity announcement objectives should be described in sufficient detail. If BPA approval or review is required at specific points, they should be defined in this section. In general, this section should include the following:

A. A clear identification of the objectives or technical problem toward which the recipient’s efforts are to be directed.

B. A detailed description of tasks that represent the work to be performed. This portion of the Project Description shall be developed in an orderly progression and in enough detail to establish the feasibility of accomplishing the overall project goals. The work effort should be segregated into major tasks and identified separately in numbered paragraphs. Each numbered major task shall delineate, by subtask, the work to be performed, and any deliverable items. If the application includes a phased approach, specify such and present specific tasks with each phase. If there is parallel performance of several broad but definable tasks, describe them and develop specific task statements for each. The Project Description shall contain every task and must be definitive, realistic and clearly stated.

C. Project Management Protocols: Include items that help to clarify and structure the project. These would include the following:

- i) Communications plan: Identify the project communication protocols. Explain how the project team members, sponsors, and stakeholders will be informed. Describe the stakeholder’s reporting requirements.

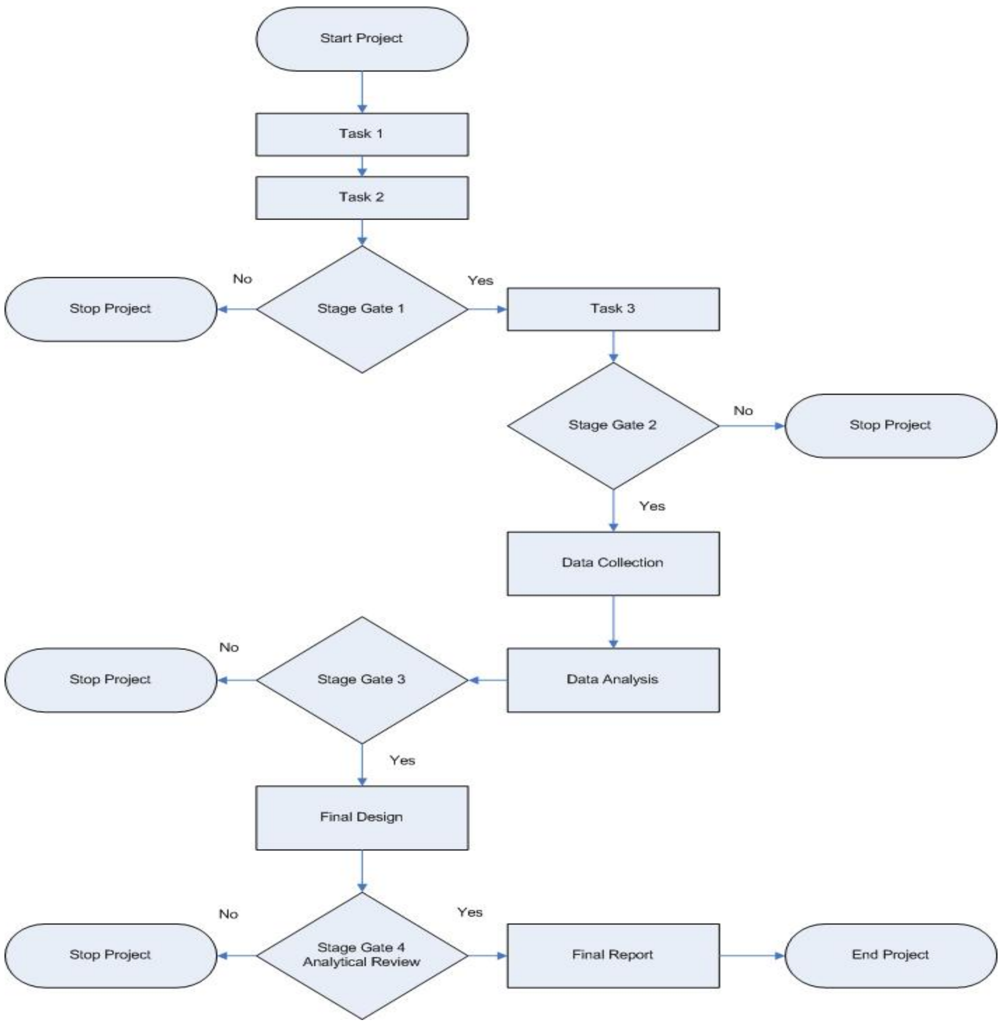
- ii) Contingency plan: Thinking ahead, what could happen that may change the original project plan? If that happens, how could the project plan be changed to still achieve the project objectives? This may be a logical place to insert a stage gate decision point (refer to Appendix II for a guidance about stage gates).

- iii) Identify Stage Gates: These are STOP/GO decision points. Criteria for determining success at each stage gate is required.(refer to Appendix II for a detailed description of stage gates)

iv) A Gantt or PERT chart of all the stage gates, tasks, subtasks, and activities. Task interdependencies should be clearly identified.

v) Project Closure – A formal project close – out meeting is required as part of the project plan. The objective of the meeting is to discuss and document lessons learned and document next steps. The close-out meeting could be tied with the presentation of the final deliverables but needs to be specifically referenced in the project plan. At a minimum the Project Technical Representative (or Contracting Officer's Technical Representative), Project Managers, and TI Project Management Officer should be involved in the formal close-out meeting.

vi) Include a Process Flow Chart that depicts the overall flow of the work and the major decisions that will be made at the stage gates. The following is an example of a process flow chart.



D. Technology Transfer

BPA understands that the outcome expected for an R&D project is not certain. However, in the event of a successful outcome, consider the potential for the proposed result to address the key roadmap component cited in the BPA Roadmap and provide a preliminary technology transfer plan for BPA application. Identify any intellectual property, data, software, or hardware that may be included in this transfer. Describe the necessary actions to move the project results towards business application.

E. Deliverables

General deliverable requirements include but are not limited to:

- All supporting data in an electronic format acceptable to BPA;
- Expected functionality and support of any hardware and/or software as applicable along with full documentation of its use and repair, as acceptable to BPA;
- Expected performance standards;
- How the proposed project will be integrated into BPA's Power Delivery System;
- How established utility processes and procedures will be impacted;
- The appropriate testing and/or evaluation methodology if applicable; and,
- A final report including next steps for the project or potential follow-on projects.

Specific material items which are to be delivered to BPA should be listed in this section. Deliverables could be specific products such as working prototypes, models, computer disks or printouts, copies of a publication or a report, presentation of workshops or briefings, test plans, specifications, drawings, test data, or other types of measurable results. Clearly identify deadlines for approval by BPA (determined by recipient's capabilities and nature of work; usually about 4 weeks) in the schedule. All data items shall be traceable to specific tasks defined in the Project Descriptions.

Identify any and all hardware/software to be delivered to BPA as a result of the effort. Specify BPA acceptance criteria for each deliverable, product or tangible result that you expect from each task, phase or area of work at agreement completion. Define criteria for establishing or indicating that a specific stage gate or phase has been completed. List the deliverables that result from the stage gate or phase tied to the execution schedule. Identify all reviews and when/where they will be conducted.

When project needs are divisible into logical and identifiable stages of accomplishment, BPA will require completion and approval of each successive stage before proceeding to the next.

F. Time Schedule (Please note that schedules should assume an October 1st start, but the table is presented without dates to allow for flexibility).

In addition to the Gantt or PERT chart specified in section "iv" above, a specific time schedule shall be provided in the Project Description. Time schedules shall include chronological listings of the specific tasks detailed under B above. If BPA's approval is needed for a particular action, that activity shall be identified in the schedule. *Schedules shall be expressed in days per task and elapsed days after award, not in specific calendar dates*. An example schedule is shown below:

Tasks	# of Work Days	Elapsed Calendar Days After Project Start
Project Start - Pre-Award/Contract Execution		
Task 1 – Short Description	20	28
Task 2 – Short Description	20	48
Task 3 – Short Description	20	60
Task 4 – Short Description	10	70
Task 5 – Short Description	55	133
State Gate 1 – approval required	10	147
Task 6 – Short Description	20	175
Task 7 – Short Description	50	217
Task 8 – Short Description	30	259
Stage Gate 2 – approval required	50	273
Task 9 – Short Description	100	322
Task 10 – Short Description	50	350
Task 11 – Short Description	60	400
Stage Gate 3 – approval required	10	405
Task 12 – Short Description	60	465
Task 13 – Tech Transfer Plan	40	505
Task 14 – Final Report	45	550
Task 15 – Project Closeout	10	555
Project Completion	-	555

EXAMPLE

APPENDIX IV – TECHNOLOGY READINESS LEVELS (TRL)

TRL 1 – Basic principles observed and reported: Transition from scientific research to applied research. Essential characteristics and behaviors of systems and architectures. Descriptive tools are mathematical formulations or algorithms.

TRL 2 – Technology concept and/or application formulated**:** Applied research. Theory and scientific principles are focused on specific application area to define the concept. Characteristics of the application are described. Analytical tools are developed for simulation or analysis of the application.

TRL 3 – Analytical and experimental critical function and/or characteristic proof-of-concept: Proof of concept validation. Active Research and Development (R&D) is initiated with analytical and laboratory studies. Demonstration of technical feasibility using breadboard or brassboard implementations that are exercised with representative data.

TRL 4 – Component/subsystem validation in laboratory environment: Standalone prototyping implementation and test. Integration of technology elements. Experiments with full-scale problems or data sets.

TRL 5 – System/subsystem/component validation in relevant environment: Thorough testing of prototyping in representative environment. Basic technology elements integrated with reasonably realistic supporting elements. Prototyping implementations conform to target environment and interfaces.

TRL 6 – System/subsystem model or prototyping demonstration in a relevant end-to-end environment (ground or space): Prototyping implementations on full-scale realistic problems. Partially integrated with existing systems. Limited documentation available. Engineering feasibility fully demonstrated in actual system application.

TRL 7 – System prototyping demonstration in an operational environment (ground or space): System prototyping demonstration in operational environment. System is at or near scale of the operational system, with most functions available for demonstration and test. Well integrated with collateral and ancillary systems. Limited documentation available.

TRL 8 – Actual system completed and "mission qualified" through test and demonstration in an operational environment (ground or space): End of system development. Fully integrated with operational hardware and software systems. Most user documentation, training documentation, and maintenance documentation completed. All functionality tested in simulated and operational scenarios. Verification and Validation (V&V) completed.

TRL 9 – Actual system "mission proven" through successful mission operations (ground or space): Fully integrated with operational hardware/software systems. Actual system has been thoroughly demonstrated and tested in its operational environment. All documentation completed. Successful operational experience. Sustaining engineering support in place.

APPENDIX V – PROJECT BENEFIT FORM

The Project Benefit Form for Volume V is attached with the FOA (BPA-0003602) on BPA Exchange: https://bpa-exchange.energy.gov/. Each application should include a completed project benefit form, which will assist evaluators in determine the benefits of the project to BPA and the region.