PSRP: Advanced Research Projects Agency – Energy (ARPA-E) ($400 Million)		
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Does this program align with an existing PART program? Y/N
No
Does this program align with an existing CFDA program? Y/N

No

If it does not correspond to existing PART or CFDA please enter in **Program Title**

Advanced Research Projects Agency – Energy (ARPA-E)

Editors Notes: This May 2010 update of the ARPA-E PSRP reflects the following changes:

- Updated the "List of Projects and Activities" table to reflect the ARRA Project and Program Direction funding amounts as identified in IDW. The previous allocations were based on estimates, prior to ARPA-E awarding FOA 1
- Added two milestones to the "Major Planned Program Milestones" section to outline ARPA-E's ARRA commitment and expenditure goals. ARPA-E determined the financial milestones were more applicable for all ARRA FOAs (1 through 3) than the previous milestones. The original Milestone #1 – Release First Grant Announcement was for ARPA-E's FOA 1 announcement, therefore in order to reflect FOA 2 and FOA 3 APRA-E added Milestone Milestone #4 – Commit ARRA Funding to account for the additional FOAs.
- Added ARPA-E's FY10 expenditure goal to Section 6 –Measures.
- Added a "2010 Quarterly Updates" column to the Section 6 – Measures to outline ARPA-E's progress to date.

ARPA-E has accomplished their FY09 Milestones for Release First Grant Announcement, Proposal Review Process Complete, and Funding Opportunity Announcement (FOA) 1 Selectees Announced. ARPA-E is striving to accomplish their Commit ARRA Funding by September 30, 2010 milestone by recently announcing their FOA 2 awardees and actively working to award FOA 2 by June 30, 2010. ARPA-E is also in process of completing the FOA 3 full application reviews and anticipates awardees selection on July 1, 2010. ARPA-E has established a robust invoice review process to assist in reaching their FY15 Milestone for expending ARRA funding.

1. Objectives
Program Purpose

ARPA-E activities work to achieve the Recovery Act goal of restoring America's scientific leadership by supporting scientific research and investing in breakthroughs. ARPA-E projects will advance the goals of promoting energy efficiency, reducing oil consumption, and reducing greenhouse gas emissions. As stated in the enacting legislation, "this new organization structure will be better positioned to support revolutionary and transformational energy research where risk and pay-offs are high."

Public Benefits

Recovery Act funding will be used in three areas: (1) to issue a Funding Opportunity Announcement (FOA) that will focus on projects with well formed research and development (R&D) plans for a transformational concept or breakthrough technology that can make a truly meaningful, not incremental, contribution towards attainment of the President's energy goals, if and when successfully deployed, (2) to form and fund 8-12 programs which will be focused on topic areas with specific technical goals, and (3) to provide for federal employees, facilities, and other support requirements necessary to implement and stand up the Advanced Research Projects Agency-Energy (ARPA-E). This includes developing and issuing solicitation documents (e.g., FOAs), conducting merit reviews, negotiating and awarding new awards, and monitoring awards to ensure transparency, accountability, and effective project management and financial oversight.

The projects sought out by ARPA-E, when successfully commercialized and deployed in the future, will permit the reduction of energy imports from foreign sources, facilitate the reduction of energy-related emissions, including greenhouse gases, and improve the energy efficiency of all economic sectors while simultaneously ensuring that the United States maintains a technological lead in the industries based on advanced energy technologies. APRA-E projects will also contribute to the Recovery Act goal of job creation, both through the immediate creation of research jobs and by funding innovative new technologies that could lead to new green jobs if the technology succeeds.

ARPA-E will achieve these goals by funding energy technology projects that (1) translate scientific discoveries and cutting-edge inventions into technological innovations and (2) accelerate transformational technological advances in areas that industry, by itself, is not likely to undertake because of high technical or financial risk.

2. Projects and Activities
Kinds and scope of projects and activities to be performed

The initial ARPA-E FOA will seek out, select, and fund R&D projects with well formed plans to develop a transformational concept or breakthrough technology that could make a significant contribution towards attainment of the President's energy goals, if and when successfully deployed. ARPA-E will begin by issuing a FOA that is narrowly focused on transformational R&D, but intentionally broad on applications and technologies, seeking to embrace a full range of concepts potentially covering all aspects of ARPA-E's mission. The intent is to harness the creativity of all sectors of the American science and technology community in support of the President's energy goals and stimulate the pursuit of new and innovative technical opportunities that can spur great leaps forward toward those goals. It is anticipated that most awards will be in the range of $2M to $5M for the base period of performance. Some may be as low as $0.5M or

as high as $10M. Efforts selected under this solicitation will be limited to no more than 36 months of performance, but there is a strong preference for a period of performance of no more than 24 months. ARPA-E will welcome submissions from any type of capable technology research and development entity. Work funded under this solicitation must not duplicate, but may complement and potentially enrich the existing portfolio of energy-related strategic research and applied technology R&D.

In addition to the initial FOA, ARPA-E will work to form 7-9 programs which will be focused on topic areas with specific technical goals. In order to form these programs, ARPA-E intends to issue a Request for Information (RFI) to solicit program area ideas from the public and/or hold 2-3 regional workshops to discuss potential program areas with industry and academics. Once specific program areas are formed, ARPA-E intends to issue focused program area solicitations to address specific technical goals.

In addition to the R&D awards, funding will be used to provide federal employees, facilities, and other support activities necessary to implement and execute the Recovery Act plan in support of ARPA-E. These activities include developing and issuing solicitation documents (e.g., Funding Opportunity Announcements), conducting program merit reviews, negotiating and awarding new awards, and monitoring awards to ensure transparency, accountability, and effective project management and financial oversight.

List of Projects and Activities

- ARPA-E Program Direction – This will provide the management and oversight for ARPA-E. Obligations of $11.3 million of Recovery Act funds are expected across FY 2009 and FY 2010.

- ARPA-E – This program will select and fund projects with well formed R&D plans to develop a truly transformational concept or breakthrough technology that could make a significant contribution towards attainment of the President's energy goals. Additionally, ARPA-E will select and fund projects that support specific program areas. Obligations of Recovery Act funds for this program are expected to total $388.7 million across FY 2009 and FY 2010.

The minimum criteria for funding are that the proposal supports the development and commercialization of a promising transformational new energy technology. This new technology shall, upon deployment, permit a reduction of energy imports, facilitate a reduction of energy emissions, or improve the energy efficiency of all economic sections; while simultaneously ensuring that the United States maintains a technological lead in the industries based on advanced energy technologies.

The table below summarizes the information listed above:

Program	Funding Amount
ARPA-E Program Direction	$ 11.3 M
ARPA- E R&D Plans	$ 388.7 M
Total	$400 M

3. Characteristics

Types of Financial Awards to be used

The Recovery Act authorizes ARPA-E the flexibility to award grants, cooperative agreements, Technology Investment Agreements (TIAs), and contracts. This range of available funding mechanisms will allow APRA-E to better fund worthwhile research projects across different types of institutions which may include universities, research foundations, non-profits, the private sector, and collaborations. The lead entity and 90% of the work performed, however, must be located in the United States.

For ARPA-E's initial FOA, cooperative agreements and TIAs are the most likely instruments to be used because of the need for substantial Government interaction during the performance of the research and development (R&D) project.

A TIA may offer more flexibility for tailoring requirements than standard financial assistance awards in certain areas, including financial management systems that comply with Generally Accepted Accounting Principles for for-profit applicants, cost accounting systems, methods of payment (*e.g.* reimbursements, advance payments, and milestone payments are available), and intellectual property terms. While a TIA would typically offer flexibility in terms of audit provisions, ARPA-E's flexibility for these provisions is limited under this FOA. The funds for this FOA have been appropriated by the Recovery Act which includes express requirements with respect to audit provisions. ARPA-E is also limited in its flexibility regarding tangible property management, including for example, real property and equipment. Otherwise, it is ARPA-E's general policy to avoid requirements that would force participants to use different financial management, property management, and purchasing systems than those currently in use.

Type of Recipient

ARPA-E welcomes submissions from any type of capable technology research and development entity. This includes, but is not limited to for-profit entities, academic institutions, research foundations, not-for-profit entities, collaborations, and consortia. The lead organization must be a U.S. entity. Federally Funded Research and Development Centers (FFRDCs), federal agencies and laboratories, and foreign entities (entities that are directly or indirectly owned or controlled by a foreign company or government) may only participate as part of a collaboration, consortium, or other teaming arrangement, and may not lead the team.

Type of Beneficiary

Types of Financial Awards	Types of Recipients	Types of Beneficiaries
B - Grants C - Cooperative Agreements C – Contracts C- Technology Investment Agreements (TIAs)	- Government / Public Nonprofit Institution/Organization (includes Institutions of Higher Education, Hospitals) - Non-government / Profit Organizations - Non-government / Private Nonprofit Institutions/Organization I (includes Institutions of Higher Education, Hospitals)	- Public nonprofit institution/organization - Other public institution/organization - Private institution of Higher Education - Private nonprofit institution/organization

Types of Financial Awards	Types of Recipients	Types of Beneficiaries
		- Profit organization

4. Major Planned Program Milestones

Since ARPA-E is a new program, planning milestones are tentative, with full program plans contingent upon the appointment of program leadership.

Milestone #1
Release First ARPA-E Funding Opportunity Announcement (FOA 1) – April 27, 2009.
This first FOA will issue a call to applicants for transformational ideas offering total funding of approximately $150M.

Milestone #2
Proposal Review Process Complete – October 17, 2009. Based on their FOA 1 response concept papers, selected applicants will be asked to submit full applications. ARPA- E will complete by June 22, 2009 the review of the concept papers received, and that week will ask selected applicants to submit full applications. Full applications will be due by August 10, 2009.

Milestone #3
Selectees Announced – October 30, 2009. After a review of the full proposals, awardees will be chosen for funding. ARPA-E will announce awardees. It is anticipated that most awards will be in the range of $2M to $5M for the base period of performance. Some may be as low as $0.5M or as high as $10M. Efforts selected under this solicitation are limited to no more than 36 months of performance, but there is a strong preference for a period of performance of no more than 24 months.

Milestone #4
Commit 100% ARRA FOA Funding – September 30, 2010. Cumulative amounts of award funding committed 45 days after funding opportunity announcement (FOA) award announcements.

Milestone #5
Expend ARRA Funds – September 30, 2015. ARPA-E will require recipients to submit plans for the use and timely expense of ARRA funds.

Milestones and other Key Dates	Target Completion	Completion Date	Comments
Milestone #1 – Release First Grant Announcement	April 27, 2009	April 27, 2009	Milestone completed on schedule.
Milestone #2 – Proposal Review Process Complete	July 10, 2009	October 17, 2009	Original target was too optimistic.
Milestone #3 – Selectees Announced	September 30, 2009	October 30, 2009	Original target was too optimistic.
Milestone #4 – Commit ARRA Funding	September 30, 2010	TBD	FOA 1 awards obligated and FOA 2 in process to be obligated.

Milestone #5 – Expend ARRA Funding			ARPA-E FOA 1 awardees have started invoicing and expenditure tracking process is being established.
	September 30, 2015	TBD	

5. Monitoring and Evaluation

I. Corporate Controls

Recovery Leadership & Operations
The DOE Recovery Office is the central point for implementation and execution of Recovery Act activities. A recovery operations team will oversee implementation management, such as monitoring project status, evaluating cost and schedule progress, ensuring thorough reporting, coordinating with external entities, and holding monthly performance and review meetings with senior departmental managers on the implementation status of specific recovery projects.

Recovery Funding Oversight, Performance
In addition to DOE's standard funds control mechanisms, Recovery Act funds are subject to additional process controls to ensure funds are not co-mingled, are tracked to enable reporting, and are spent responsibly. DOE recovery funds are released for implementation in a staged approach. Programs develop initial project plans which include performance metrics and require the Secretary of Energy's approval.

Office of Internal Review (OIR)
DOE's OIR helps programs ensure that internal controls are in place, effective, and support the risk based approach to managing Recovery Act activities. OIR programs are being implemented or expanded to ensure the Recovery Act objectives are met and DOE managers and partners are both held accountable for successful execution and also have the appropriate tools to ensure that success. These programs include coordinating DOE's "Internal Control Acknowledgment" program, conducting agency wide assessments and analyses and performing oversight of Recovery Act programs, including site and field visits. OIR worked with key impacted programs to produce initial vulnerability assessments identifying potential program specific and cross-cutting risks to ensure successful execution

II. ARPA-E Processes and Systems

The initial portion of the funding will go towards setting up the program, in terms of both human capital and physical infrastructure such as office space and information technology, to establish the processes and systems needed to run the program on an ongoing basis.

Program Direction funding will be utilized for federal, contractor, or Interagency Personnel Assignment staff to support the stand up of ARPA-E. The ARPA-E program will include General Counsel and procurement officials to ensure proper oversight of contracts and general program activity. ARPA-E staff will include term appointed Program Managers who are experts

in a variety of relevant technical fields, and who will be responsible for monitoring and reviewing the progress of funding recipients under their direction.

Additionally, contractor support will be utilized to augment the ARPA-E team. This support will be used to assist in developing project milestone schedules, project operating plans and recovery project plans, and assessing traceability/auditability of performance metrics.

ARPA-E will develop a project control system once the program is properly stood up. This system will be designed with auditing functionality and will interface with the department's iPortal system.

ARPA-E will track time-phased funding information and related performance and milestone data via the DOE's Corporate Planning System (CPS), allowing ARPA-E to generate documents for authorizing performance of the specific activities. By tracking performance, cost, and milestones at the project level, ARPA-E will have the granularity needed to manage progress towards objectives. This information will then be used to make corrections to the activity (both positive and negative) including performance and funding adjustments.

6. **Measures**

ARPA-E near-term measures are below. Once hired, Program Managers will develop project-specific measures. The anticipated long-term benefits of the program (such as reduced greenhouse gases, reduced oil imports, and jobs created from the emergence of new companies and industries) are likely to be indirect, years further in the future, and difficult to measure or attribute directly back to ARPA-E. ARRA Funds Expended on Schedule – This metric is defined as the performance of ARPA-E as a research and development funding efforts as compared to other similar agencies in terms of its ability to successfully monitor projects to avoid unnecessary delays and cost overruns. APRA-E requires recipients to submit plans for the use and timely expense of ARRA funds, in addition to closely monitoring recipients invoices.

Measure Text	Type	Frequency	Direction.	Units	Original Target	2010 Quarterly Updates	2010 Target
ARRA Grant Funding Awarded on schedule	Output	Quarterly	+	%	0	FY09Q4 – 3%, Actual 1% FY10Q1 – 15%, Actual 17% FY10Q2 – 25%, Actual 24% FY10Q3 – 30% Actual TBD FY10Q4 – 27% Actual TBD	100%
# Program Managers hired	Output	Quarterly	+	#	12	FY09Q3 – Planned: 0, Actual: **2** FY09Q4 – Planned: 2, Actual: **1** FY10Q1 –	12

Measure Text	Type	Frequency	Direction.	Units	Original Target	2010 Quarterly Updates	2010 Target
						Planned: 2, Actual: **0** FY10Q2 – Planned: 2, Actual: **1** FY10Q3 - Planned: 2, Actual: **2** FY10Q4 - Planned: 4, Actual: TBD	
Percent of Concept Papers/Applications Reviewed and Responded to within 60 days of closing date	Efficiency	Quarterly	+	%	0	Completed for FY10Q1 and FY10Q2. FY10Q3 and FY10Q4 TBD	75%
ARRA Funds Expended on Schedule for FY10	Output	Yearly	+	%	0	Estimate for FY10Q1 1% and FY10Q2 2 %.	5%

Explanation of Measure

The table below lists the proposed measures for the first phase of the ARPA –E program:

Measure	Description
ARRA Grant Funding Awarded on schedule	Award all of the Recovery Act funding for ARPA-E on schedule; based on milestones and expected FOA release dates. ARPA-E will perform a quarterly trend analysis to track progress towards goal. Goal Schedule: • Q4 2009 – 3% • Q1 2010 – 15% • Q2 2010 – 25% • Q3 2010 – 30% • Q4 2010 – 27%
# Program Managers hired	Because of the time limit placed on the obligation of Recovery Act funds, ARPA-E will need to hire quickly qualified Program Managers to review the concept papers and applications for funding received. ARPA-E will perform a quarterly analysis to track the number of Program Managers hired.
Percent of Concept Papers/Applications Reviewed and Responded to within 60 days of closing date	Because of the time limit placed on the obligation of Recovery Act funds, ARPA-E will review and respond quickly to the concept papers and applications for funding received. ARPA-E will perform a quarterly analysis to track the percent of concept papers and applications reviewed and responded to within 60 days of the closing of the FOA.
ARRA Funds Expended on Schedule	Expend all ARRA funding for ARPA-E on schedule. ARPA-E will perform a yearly trend analysis to track progress towards goal. FY11 – 25% FY12 – 50% FY13 – 75% FY14 – 85% FY15 – 100%

7. Transparency and Accountability

DOE leverages its existing corporate systems to track and report on Recovery Act activities and to ensure effective funds management. The DOE's iManage Data Warehouse (IDW) is a corporate enterprise system integrating financial, budgetary, procurement, and program information to monitor project execution. Each Recovery Act program is tracked using unique Treasury Appropriation Fund Symbols (TAFS), and each component project is identified by a unique Project Identification Code (PIC).

IDW is a central data warehouse linking common data elements from each of the Department's corporate business systems and serving as a "knowledge bank" of information about portfolios, programs, or projects including budget execution, accumulated costs, performance achieved, and critical milestones met. The IDW contains information from multiple corporate systems and will be a tool used to meet information needs for Recovery Act oversight and reporting to Recovery.gov.

The Performance Measure Manager (PMM) is the Department's performance tracking system. PMM tracks high-level budgetary performance and is being expanded to accommodate Recovery Act performance tracking needs. Performance evaluations will be organized and reported along with results from the Department's annual budgetary activities in the Annual Performance Report (APR). Performance results will be uploaded into the IDW for required agency reporting.

See DOE's Agency Wide Recovery Plan for additional information on DOE's financial and performance tracking mechanisms, found here: www.energy.gov/recovery.

DOE is committed to conducting oversight of its Recovery funds to prevent waste, fraud, and abuse; and will ensure that:

- **Funds are awarded and distributed in a prompt, fair, and reasonable manner**. DOE contracting officers will comply with changes to pre-solicitation and award notice processes as mandated by FAR Case 2009-010, American Recovery and Reinvestment Act of 2009, Publicizing Contract Actions.
- **The recipients and uses of all funds are transparent to the public; public benefits of funds are reported clearly, accurately, and in a timely manner**. The standard terms and conditions in individual award agreements will provide information on data elements recipients will be required to report to comply with Section 1512 of the Recovery Act. All OMB specified reporting requirements will be included in project agreements.
- **Funds are used for authorized purposes and instances of fraud, waste, error, and abuse are mitigated**. Project reports containing information on use of Recovery funds will be required from all awardees, including any sub-awards made by the prime recipient. Frequent announced and unannounced monitoring of recipients will include inspection of records, recordkeeping processes, and reporting systems.
- **Recovery Act projects avoid unnecessary delays and cost overruns**. ARPA-E will require recipients to submit plans for the use and timely expense of Recovery Act funds. Final determinations of acceptability of plans will be made by the ARPA-E Program Managers with advice from DOE Internal Review staff.
- **Program goals are achieved, including specific outcomes and improved results on broader economic indicators**. ARPA-E Program Managers will maintain an oversight capability through

regular review meetings to ensure that cost, scope, and schedule baselines are achieved. Regular monitoring of individual projects will ensure reporting requirements are being met and projects are proceeding towards stated objectives.

The ARPA-E website contains more information related to the program.

ARPA-E Program Managers will publish overall program goals and areas of interest to encourage applications and additional R&D efforts in those areas. Performance measures from the funded projects will be tracked, aggregated, and announced periodically.

8. Federal Infrastructure Investments

The ARPA-E program will be using Recovery Act funds primarily to fund early-stage research & development activities and is not expected to be used to build or operate any significant infrastructure. During application review and project supervision, any work regarding infrastructure improvements will be expected to consider relevant environmental, efficiency, and "green" building requirements.