

## **Statement of Work**

### **Energy Sector Planning and Analysis (ESPA) For the National Energy Technology Laboratory (NETL)**

The goal of this procurement is to provide ESPA Services for the NETL. The following format has been used for this Statement of Work (SOW):

- 1.0 Objectives**
- 2.0 Technical Scope of Work**
- 3.0 Management Planning**
- 4.0 Glossary**

#### **1.0 OBJECTIVES**

The objective of this solicitation is to obtain expert services that will complement and support the efforts of federal staff in strategic energy sector analysis and planning, engineering analysis using state of the art simulation and modeling tools, R&D benefit analyses, life-cycle analysis, natural resource development impact assessment, e.g., water resources, and energy infrastructure analyses. These services require effective management of the Contractor's human and other resources to support the range of programs and subprograms delineated in Attachment A-1—NETL Introduction. Resources include: a personnel-mix having technical expertise in scientific, engineering, business and policy disciplines needed for in-depth understanding of advanced technologies and complex systems and legislative and policy issues; and advanced/specialized tools, expertise, and protocols that make it possible, to facilitate, and accelerate anticipated analyses.

To efficiently execute work assignments through task orders, the contractor must effectively assess and adjust staffing to respond to both the changing programmatic requirements inherent to complex research organizations such as NETL and the dynamics of regulatory and political processes. This flexibility in staffing is an important objective of the overall contract and requires that managers and staff remain current on program requirements and technical advancements. The Contractor shall have a sufficient level of expertise to successfully support the management and integration of all stages of science and technology development leading to commercially viable solutions. Through this contract NETL seeks to access a best in class on-site, RDD&D support organization that can assist in conducting its mission and achieving its vision, particularly in those areas of energy sector planning and analysis.

#### **2.0 TECHNICAL SCOPE of WORK**

The Contractor shall support program initiatives in functional areas (see below) that are typically employed at NETL to bolster the advancement of current programs and foster the development of future program initiatives. The contractor shall manage its workforce and the overall execution of work to ensure appropriate staffing of individual tasks, integration of work products, product quality, communication among tasks, and coordination within the program organizational structure.

Unless otherwise directed by NETL, all analyses shall be conducted in accordance with the following guidelines:

- NETL's Systems Study Scope and Reporting Requirements
- Title IX, Subtitle J, Section 999 (EPA Act 2005) Annual Plan and all derivative directives/requirements, as applicable

The scope of work entails providing the federal staff with support in the following functional areas and is expected to result in data, models, simulations, presentations, and written reports that may be stand-alone or may be used as resources to develop factsheets, brochures, multi-media, and other outreach materials:

## ***2.1 Strategic Energy Sector Analysis***

### **2.1.1 Overview**

The Strategic Energy Sector Analysis functional area entails providing support and analysis to NETL that may be used in DOE/NETL responses to high priority requests that demand immediate attention from key internal and external stakeholders e.g. the Office of Management and Budget, Congressional staff, and senior department officials. These requests include (but not limited to) the following topics:

- Technical aspects of program planning, analysis, and evaluation.
- Analyses of existing/proposed regulatory, environmental, energy and legislative impact analyses.
- Evaluation of complex legislative issues, including technical, economic and environmental evaluations of new initiatives and policies.
- Cross-cutting evaluations that may include several of the functional areas described below and/or may encompass several energy sectors (fossil, nuclear, renewable, transmission, distribution, generation, resource production etc.).
- Environmental scanning.
- Technical training and consultation.

### **2.1.2 Technical Elements**

The Contractor shall provide supporting analysis to NETL which may be used by DOE/NETL in responding to high priority requests that demand immediate attention from key internal and external stakeholders e.g. the Office of Management and Budget, Congressional staff, and senior department officials. Upon request by NETL, the Contractor shall provide appropriate expert resources, such as business,

legislative/regulatory, economic, technical, and computer modeling experts, as required for supporting quick-turnaround responses. The contractor shall provide technology transfer and training to the federal staff. Requests may include, but not be limited to, supporting analysis and evaluation for the following topics:

- a. New R&D program areas that advance energy technologies in both traditional and non-traditional Fossil Energy mission areas (this includes unconventional coal utilization, hydrates, shale oil, oil sands, tight sands, and other emerging energy areas).
- b. Technical review of proposals and other reports as requested.
- c. Energy and the environmental scoping-level investigations for issues such as:
  - i. Coal, oil, natural gas and LNG supply/demand, infrastructure constraints and responsiveness to potential disruptions.
  - ii. Fossil energy fueled power capacity building and assessment of technologies and/or regulations impacts on siting, nationally and/or regionally, including new or anticipated emission limitations and the availability of process and cooling water particularly in the western U.S., the key implications of CO<sub>2</sub> regulations, offsets, carbon taxes and international interdependencies.
  - iii. Environmental and other regulatory impact issues, including ascertaining the impact of proposed and existing legislation with respect to intended applications of specified technologies, and providing recommendations to address those issues.
  - iv. Energy efficiency – building and transportation.
  - v. Renewable energy.
  - vi. Nuclear energy.
  - vii. Efficient energy storage (especially electric) transmission and distribution.
  - viii. Exploration, production, distribution, and advanced utilization of coal, oil and gas.
- d. Technological, societal, environmental, and economic factors for complex energy issues in support of policy development and strategic planning.
- e. World-wide scientific and technological progress towards specific energy issues, legislative requirements, and Departmental goals, including evaluation of options to resolve remaining gaps and complement ongoing programs. This will require periodic review and analysis of key meeting/forum records, analyses, position papers, and other reports related to energy.
- f. Literature reviews and analyses that provide supporting information for alternative recommendations to decision makers seeking to allocate available RDD&D fiscal resources to a set of competing technological alternatives.

- g. Energy trends evaluation across a broad range of conventional and advanced technologies including, but not limited to, the program areas listed in Attachment A-1 – NETL Introduction.
- h. Analyses of new scientific advancements, reviews and assessments in material technology/science, computational, and sensor and control systems achieved in fields not traditionally associated with energy systems to determine the applicability of these advancements for overcoming fundamental energy system barrier issues.
- i. Supporting evaluations that assist NETL in identifying and developing new traditional and non-traditional energy program areas.
- j. Monitoring market, policy, and regulatory developments and evaluating the effects of current or potential policies and regulations on markets and performance requirements for energy technologies.
- k. Risk analysis support for energy sector assessments by identifying and evaluating methodologies that lend themselves to the RDD&D environment.

## ***2.2 Techno-economic Analysis and Modeling***

### **2.2.1 Overview**

The contractor shall provide techno-economic and modeling analyses of current state-of-the-art and advanced resource production/extraction approaches, energy generation and conversion systems that supplement and complement those being performed by the federal staff. The techno-economic analyses and models will be developed primarily in support of the technology areas described in Attachment A.1 – NETL Introduction, and shall include all energy generation/conversion systems and greenhouse gas mitigation systems being developed internal and external to the Office of Fossil Energy’s research and development portfolio. Other energy-related technologies that may also be investigated could include biomass co-processing, nuclear power, advanced coal-derived fuels, renewable energy, and strategies for mitigating the effects of global climate change.

Analysis type includes (but is not limited to): systems engineering, technology performance validation, environmental analysis, economic, cost-benefit, scale-up and risk; literature reviews; and cost escalation, feasibility, resource development/multi-scenario, risk, and market studies. The contractor shall also support NETL in the development and application of modeling analyses, including but not limited to: cost methodologies and models, cost estimation software, spreadsheet software, steady-state process simulation software, reservoir simulators, resource discovery and reserve growth models, spreadsheet models, model documentation, cataloguing of models, and testing and evaluating new models/software applications. Contractor efforts shall include (but not be limited to) literature searches, evaluation of modeling

tools, data collection, sensitivity studies, and interpretation and reporting of results in written and electronic media.

The current platform at NETL for the majority of detailed analyses is Aspen Plus™. The contractor shall be proficient in the use of this software such that existing NETL-developed models can be utilized by the contractor and so that those developed as a result of this effort will be compatible within the existing NETL software infrastructure. Expertise is required in the use of other specialized hardware and software systems including, but not limited to:

- Icarus
- IECM
- GATECYCLE
- Thermoflow (GT-PRO, Thermoflex, PEACE, SteamPro)
- EXCEL—VBA programming
- VISIO
- PC-Trax
- NETL Power Systems Financial Model (PSFM)
- Web-based programming
- Benefits models such as NEMS, MARKAL, GERTT, NETL's GoM Flow Measurement Point model, porous media numerical models (F-E and F-D), R&D benefits models that are in the development stage
- MMS production and royalty/tax collection models and databases
- EIA oil and gas data sets
- USGS resource assessment methodology(ies)
- Nehring database
- GIS systems

### **2.2.2 Technical Elements – Analysis**

The Contractor shall perform supporting specialized engineering systems studies resulting in unbiased assessments of the technical, environmental and economic performance for the following: conventional, unconventional, and advanced energy conversion technologies, environmental technologies and greenhouse gas reduction technologies and accommodating strategies. By performing comparative analyses, it is anticipated that the value of a given technology with respect to performance and cost advantages, as compared to current state-of-the-art and emerging technologies, can be ascertained. To accomplish this objective, the Contractor shall provide a broad spectrum of expert process engineering, cost estimating, and engineering analysis services to accomplish a set of tasks including, but not limited to, the following:

- a. Developing zero-dimensional, steady state, thermodynamic process models of energy conversion processes to assess their overall technical and environmental performance using computational tools named above.

- b. Synthesizing novel configurations of energy conversion processes using advanced technologies to assess issues related to the integration of advanced technologies within systems contexts.
- c. Estimating the capital and operating costs of conventional and advanced energy technologies and conducting financial and economic studies of energy conversion systems, including the computation of return on equity and/or levelized cost of electricity.
- d. Framing energy program development by identifying the process conditions, technical performance targets, and costs that must be achieved by emerging technologies in order to meet mission objectives. Support the characterization of technology development and deployment needs by preparing goals, roadmaps, strategies and performance metrics.
- e. Preparing and supporting independent technical reviews, comparative engineering and economic studies, commercial feasibility studies, cost-benefit studies, validations of performance and accomplishments, scale-up studies, assessments of costs and schedules, and technical and cost risk analyses for new or proposed technologies.
- f. Supporting research, development, demonstration, and standards (RDD&S) rule-making and test procedure activities. This includes support to evaluate technologies, compare alternative programs, projects, and activities and assess potential future directions by providing a solid foundation of unbiased scientific, engineering, environmental, and economic and market assessments.
- g. Providing independent technical reviews of systems studies completed by NETL.
- h. Gathering and analyzing existing technical and economic data. Identify data gaps. Maintain data sets.

### **2.2.2 Technical Elements -- Modeling**

The Contractor shall provide a broad spectrum of technical and engineering expertise to support engineering analysis computational modeling. This work will include the development, application, modification, verification, testing, documentation, reporting, and maintenance of computational software that can be used to examine energy-based systems. Support efforts shall include, but not necessarily be limited to:

- a. Developing, evaluating, validating, documenting, and testing system simulations and engineering process models to ensure compatibility with existing simulation codes and to provide user-friendly access to a library of modules for NETL researchers and analysts.
- b. Providing support to NETL tasks with steady-state process simulators and macroeconomic models such as those named above.

- c. Providing expertise in specialized hardware and software systems, such as those named above.
- d. Maintaining a library of simulation codes and models, including appropriate documentation, for user-friendly access of modules for NETL researchers and analysts.
- e. Evaluating new models/software applications for engineering analysis.

## **2.3 Benefit Analysis**

### **2.3.1 Overview**

The Contractor shall support DOE/NETL and work in coordination with sponsors to credibly forecast the benefits of energy programs and keep abreast of and current with the many activities underway at the international, national, state, and regional level regarding legislation, regulation, and policy actions that affect fossil fuel extraction and energy production.

This shall include exercising the NEMS and MARKAL models, Economic Input/Output models, and related benefits models currently being developed under different technology, market, and policy scenarios and conducting analyses of model results, specifically with respect to the deployment of advanced fossil energy production/supply and conversion technologies and the associated economic and environmental impacts relative to reference case scenarios. This effort involves the use of software tools to forecast market penetration of energy technologies and the use of post-processing analysis tools to calculate economic, environmental, and energy security benefits. The Contractor will provide, on an as-needed basis, with benefits forecasts, detailed understanding of the modeling tools, benefits calculation procedure, data processing and manipulation, improvements to the methods used, results analysis, and development of documentation related to models, methodology, and results.

Supporting services shall also include research, data development and compilation, analysis, and model development needed to produce model alterations and/or values for exogenous input parameters that accurately characterize FE-developed technologies within NEMS, MARKAL and other benefit models that capture oil and gas benefits. The contractor shall also provide support to research, analysis, and model development efforts needed to derive externalities and economic benefits associated with the deployment of FE technologies that are not estimated directly by NEMS or MARKAL. The contractor shall also support federal staff in incorporating technology risk into R&D benefit assessments.

Benefit analysis support shall also include (but not limited to) literature searches, benefit and risk assessment tool evaluation, data development and collection, benefit

and risk model and tool development, sensitivity studies, and interpretation and reporting of results in written and electronic media.

Finally, benefits analysis support shall include coordination with other organizations and agencies, e.g., MMS to secure raw and processed data, conduct tasks of an overall analytical effort, merit/peer review data, analyses, conclusions, and reporting. Said coordination is requisite in meeting multiple Administrative and Congressional requirements.

### **2.3.2 Technical Elements**

The Contractor shall provide a broad spectrum of expert modeling and analyses services that include, but are not limited to:

- a. Developing techno-economic models of energy production, transport, and conversion systems with the capability to accept stochastic inputs.
- b. Gathering transactions data on coal, natural gas, crude oil, petroleum products, electricity, and other commodities and conduct econometric analyses to identify and quantify trends and correlations.
- c. Designing and implementing revisions to NEMS and Markal to better characterize (1) investment decisions associated with the production and conversion of fossil fuels, including options associated with existing assets and (2) responses to GHG mitigation actions and other environmental regulations and impacts on GDP.
- d. Designing and developing next-generation models that characterize investment decisions in the electricity supply and fuels sector to include phenomena such as options values, fuel supply uncertainty, regulatory uncertainty, decision-maker objective functions, institutional incentives, and regional factors. Defining and gathering needed data for the new models.
- e. Gathering data and conducting analyses to forecast price/supply curves for domestic natural gas, crude oil, and coal resources.
- f. Using published systems analyses to develop cost, efficiency, and O&M inputs for energy supply, transport, and conversion systems.
- g. Gathering data and conducting analyses of energy supply and conversion systems in foreign countries.
- h. Gathering data and conducting analyses to define cost/supply curves for GHG emissions reduction from domestic terrestrial sequestration and domestic non-CO2 GHG abatement

- i. Designing, organizing, and facilitating meetings with academics, researchers, and industry professionals to gather information on energy supply and conversion systems of interest to NETL. Specifically, expert opinions on the range of outcomes possible from research activities for given future timeframes shall be gathered and analyzed.
- j. Reviewing technical documents on subjects including energy supply, energy conversion, and energy systems modeling and providing encapsulations and critical analyses.
- k. Developing input/output models to characterize the regional economic impacts associated with deployment of energy supply and conversion systems.
- l. Gathering data and conducting analyses to estimate price and supply elasticity within the domestic fuels and electricity supply sectors.
- m. Gathering data and conducting analyses of advanced T&D systems, and advanced load leveling/demand response systems.
- n. Exercising NEMS, Markal and other available tools to develop analyses and critical evaluations of significant DOE programs.
- o. Supplying/developing and applying robust and transparent models for predicting and measuring the impacts of technology demonstration on the market penetration of new energy-related technologies, including unconventional resources and technologies, into the energy supply, conversion, and transmission and distribution markets.
- p. Providing expert recommendations on emerging technological and energy resource areas that cross-cut energy product lines including, but not limited to, agricultural, energy, electric grid and water issues, renewable energy potential and questions, and technical considerations concerning advanced nuclear energy technology.
- q. Gathering data and conduct analyses of policy and regulatory proposals and actions focusing on myriad energy-related issues that are becoming more prevalent – especially in the areas of climate change and green house gas (GHG) emissions, and potential policy and regulatory constraints related to access to energy resources and their extraction, transportation, processing, and end use.

## ***2.4 Life-Cycle Assessment***

### **2.4.1 Overview**

The contractor shall provide support analyses that include (but are not limited to): life-cycle assessment (according to ISO 14040/14044 and draft ASTM Standard

E06.71.10) and life-cycle costing of existing and future energy technologies for power and/or fuels production, and natural resource extraction, processing, transportation, and end use. Development of life-cycle analyses is a multi-disciplinary area that requires a broad range of analytical and technical capabilities to characterize power and fuel production operations from cradle-to-grave using a process-based modeling approach.

The contractor shall support federal staff in the development of attributional and consequential life-cycle analyses. Services include (but not limited to): literature searches, evaluation of existing life-cycle studies, data development and collection and organization, development of cost and environmental life-cycle models and tools, development and application of impact assessment characterization methodologies (both mid-point and end-point impacts), sensitivity and uncertainty analysis, and interpretation and reporting of results in written and electronic media.

#### **2.4.2 Technical Elements**

The Contractor shall support federal staff in performing life-cycle analysis of power and fuel production technologies, greenhouse gas reduction technologies, and secondary support operations to evaluate the comparative benefits and drawbacks of various options. By performing comparative analyses, it is anticipated that the value of a given technology with respect to life-cycle impacts (environmental and cost), as compared to baseline and emerging technologies, can be ascertained. To accomplish this objective, the Contractor shall provide a broad spectrum of expert process engineering, cost estimating, and engineering analysis services support to, but not limited to, the following:

- a. Identifying, collecting, and analyzing publicly-available data to characterize existing operations. Collaborate with industry experts and relevant stakeholders to ascertain the best available, un-biased, data to characterize each operation.
- b. Developing and using environmental life-cycle assessment models capable of managing and analyzing life-cycle inventory data (e.g., dynamic unit process models, impact characterization factors, data uncertainty properties, and study results). Familiarity with commercial life-cycle assessment software packages, such as GaBi 4.0 for the Environment; greenhouse gas accounting software; and risk analysis software, such as @Risk 5.0, are preferred.
- c. Identifying environmental impacts to the biosphere caused by primary, secondary, or tertiary operations across the life-cycle of energy technologies. Develop impact characterization methodologies and factors to assess the potential benefits and drawbacks of such environmental interventions.
- d. Identifying knowledge gaps in existing life-cycle related data necessary to support decision-making processes, such as, but not limited to, technology selection for research and development, public awareness, and policy guidance. Effectively

communicate the quality of life-cycle analyses based on existing data limitations to ensure proper use of study results.

- e. Collecting primary data through interviews, surveys, and site visits to improve data quality of existing unit process data to increase the accuracy and utility of study results.
- f. Developing custom life-cycle cost models capable of aggregating a broad range of cost information into a comparable platform to calculate and report results. Models shall be capable of reporting a broad range of cost metrics relevant to the power technology, fuels production, and financial investment communities.
- g. Assessing the uncertainty of life-cycle analysis results based on the temporal, geophysical, and technical applicability of data to stated study goals and scope. Uncertainty of data relevant to collection precision and/or accuracy shall also be captured and assessed to evaluate study quality.

## ***2.5 Energy Infrastructure Analysis***

### **2.5.1 Overview**

The contractor shall provide support to the Federal staff responsible for specialized strategic analytical studies for current and future energy infrastructure issues such as (but not limited to): electric grid reliability, grid infrastructure, pipelines of all types, e.g., natural gas, crude oil, water, and CO<sub>2</sub>, coal transport; commodity shipping; environmental policy; power plant siting and dispatch, energy restoration and recovery, energy sector interdependences, and fuel resource characterization.

### **2.5.2 Technical Elements**

The Contractor shall provide supporting strategic analytical expertise for current and future energy infrastructure studies associated but not limited to the following:

- a. Energy infrastructure security, reliability, restoration and associated assessments of risk
  - i. Physical and cyber security aspects analysis
  - ii. Knowledge products and dissemination methods development to aid decision making
- b. Energy systems resiliency
  - i. Facilities interconnections with other energy infrastructures and supporting infrastructures
  - ii. Interdependencies of energy sector systems
  - iii. Redundancies of critical infrastructures
- c. Electric grid infrastructure

- i. New technology development and commercialization for integration of renewable energy sources, superconductors, and advanced energy storage and control technologies, among others.
- d. Energy pipeline infrastructure, including existing structures for Petroleum and Natural Gas, new energy commodities such as Ethanol, Hydrogen, etc., and supporting infrastructures such as CO<sub>2</sub>, water, and others
- e. LNG supply, infrastructure, siting and regulation
- f. Coal transportation (e.g. rail, barge, and other) – including commerce, infrastructure, and transportation policy and regulation
- g. Environmental policy (i.e. GHG and criteria pollutant emissions)
- h. Power plant siting and dispatch
- i. Energy system visualization and monitoring associated with, but not limited to, the following:
  - i. Energy system response and recovery analysis,
  - ii. Analysis and reporting methodologies regarding electricity, coal, petroleum and natural gas infrastructures
  - iii. Coordination with partnering agencies for interdependent systems analysis with regard to disruption consequences, response and recovery analysis and to enhance credentials within the infrastructure analytical community.
  - iv. Capability development to track hydrocarbon production and transportation to advance existing capability to track hydrocarbon production and delivery by enhancing connectivity models and relational algorithms
  - v. Analysis of various aspects of the energy infrastructure and their interdependencies.
  - vi. Maintenance of an energy infrastructure data server
- j. Characterization of Crude Oils and Crude Oil Mixtures
  - i. Detailed analyses of crude oil streams, cargoes and storage cavern composites necessary to ascertain the quality of the stored oil
  - ii. Analyses needed to evaluate and address quality control issues related to crude oil stored in the Strategic Petroleum Reserve (SPR) or delivered from SPR.
- j. Water resource, conservation, utilization and distribution issues

## ***2.6 Technical Communications and Outreach***

### **2.6.1 Overview**

The focus of this functional area is to provide services to NETL energy sector planning and analysis areas. Services provided within this functional area require that the Contractor work within the NETL corporate structure and programmatic mandates for management of communications products, project documentation, research reports and outreach functions. The Contractor must coordinate and communicate among organizational elements at NETL, including the NETL Public Affairs Office and other contractors. The Contractor must ensure work products are compatible with NETL standards and work practices relating to **public** outreach and communication products, the external web site, NETL's information technology systems, and HQ

information management systems. NETL maintains corporate public affairs and information technology organizations to ensure overall consistency in the laboratory's communication products.

### **2.6.2 Technical Elements**

Work elements include, but are not limited to, the following activities:

- a. Conducts general outreach work by preparing narrative and visual materials and tools for developing presentations, technical brochures, and other multi-media that capture and disseminate analysis results and evaluations.
- b. Assists the Government in developing partnerships and collaborations with the private sector and other government agencies to affect the commercialization and transfer of technology, and promote new initiatives.
- c. Develops, maintains, reviews, and continually enhances content related portions of the NETL website for energy sector and planning areas. As needed, assists in the development of technical content for new and existing portions of the website.
- d. Develops, maintains and manages the content of system analysis-specific databases and/or information management systems to track and control technical work products. This may include investigating, recommending, and developing new systems/tools and/or improvements to existing systems.
- e. Assists in arranging, organizing and conducting conferences, topical training sessions on emerging energy issues, and review meetings. As requested, supports the technical preparations for and participation in selected conferences, meetings, and workshops. Activities may include: updating technical information to be used in displays and exhibits; developing technical content for success stories and other technical materials for distribution at conferences; providing technical personnel to staff conference exhibits and technically support conference attendees. Provide support for identifying and arranging for the participation of independent technical experts to serve as reviewers for peer review meetings.
- f. As needed, provides support for NETL relationship building efforts with universities, industry, and other strategic stakeholders. Assists in identifying opportunities and managing strategic partner relationships to fully leverage communication and outreach activities. Provides miscellaneous communications and outreach strategy development, execution and deployment support as needed.

### **3.0 MANAGEMENT PLANNING**

The Contractor shall actively manage their workforce and the overall execution of work to ensure appropriate staffing of individual tasks, maintenance of staff knowledge and skills, integration and quality of work products, communications among tasks, and coordination within the program organizational structures. Management and oversight functions of assigned task orders by the contractor are facilitated by the development and maintenance of effective planning or procedural documents delineated below.

#### ***3.1 Organizational Management Plan***

The Contractor shall develop and maintain a Management Plan, and utilize this plan to manage the total work and individual task orders assigned under the contract. The Management Plan is a specified deliverable under the contract; however, it must be updated and revised by the Contractor, as required, and reviewed at least annually, by both NETL and the Contractor, to ensure that it accurately reflects current estimated work load and significant changes in requirements. The Management Plan is to be the guiding document for the Contractor's organization that delineates how the work is organized and defines the management, technical and administrative systems that will be used to meet the objectives of this contract. The Management Plan should specifically reference the Contractor's management practices and procedures as appropriate for the conduct of the work.

At a minimum, the Contractor shall include the following information in the Management Plan:

- 1) High-level executive summary
- 2) Scope of work
- 3) Work breakdown structure aligned with task orders
- 4) Organizational work breakdown structure and associated staffing plan
- 5) Communications plan delineating overall and task lines of communication and coordination requirements
- 6) Quality Assurance/Quality Control (QA/QC) practices for individual work products
- 7) Projected funding and costing profiles, once tasks are assigned
- 8) Success criteria and planned outcomes for the organization

#### ***3.2 Task Management Plans***

The Government will identify individual tasks or groups of tasks that are to be funded throughout the fiscal year. There shall be no individual subtasks identified within the contract structure; subtasks and lower level work elements shall be included in the Task Management Plan defined for the specific task orders. Task Orders will be issued in writing by the Contracting Officer designating (1) the task to be performed; (2) the schedule of performance; (3) authorized travel; (4) any Government-furnished property; and (5) any special instructions. Such Task Orders will specify deliverables and required delivery dates. Deliverables may consist of statements, charts, reports, briefing notes,

tabulations, databases, models/simulations, view graphs, and other forms of presentation as appropriate. If appropriate, based on 48 CFR 945, property which is Government-furnished or Contractor-acquired will also be listed in the Government-Furnished Property List of this contract as well as in the individual Task Orders.

The Task Management Plan shall include:

- a. Technical Approach  
The technical approach provides an overall summary of the important aspects of the effort and the methodology, resources and QA/QC process that will be deployed to accomplish the work outlined in the task;
- b. Cost Plan  
The task cost plan shall propose cost against a work breakdown structure. This cost plan shall include the following detail to demonstrate all estimated costs at the lowest level of work breakdown structure have been identified:
  - i. Directive Productive Labor Hours (DPLH) by labor category on a monthly basis, including overtime (if authorized), and total DPLH, including subcontractor and consultant DPLH, if applicable;
  - ii. Travel, training, equipment, supplies, and materials estimate;
  - iii. Estimated subcontractors and consultants costs, including DPLH if applicable. (Subcontractor and consultant costs need to be provided at same level of detail as the prime)
  - iv. Other pertinent information (e.g., indirect costs, inter-divisional transfers);
  - v. Estimated computer time and cost, if applicable;
- c. Milestone schedule;
- d. Monthly staffing plan detailing proposed direct productive man-hours by labor categories;
- e. Any known impacts to other previously authorized work;
- f. Quality objectives or success criteria – mutually developed between the Task COR and the Contractor Task Manager

### ***3.3 Execution of Task Orders***

The Contractor shall execute the work elements and tasks in accordance with the approved Task Management Plans.

### ***3.4 High Level Metrics Reporting***

The Contractor shall develop a High-Level Metrics Reporting Plan that the Government will use to evaluate overall performance in meeting the requirements of the SOW. The High-Level Metrics Reporting Plan summarizes the metric and its acceptable quality levels, it describes how performance will be monitored and how the results will be evaluated. The High-Level Metrics Reporting Plan will be reviewed by DOE/NETL on a

yearly basis and will be due 30 days after the beginning of the fiscal year. At a minimum, the plan should address the following metrics:

- Funds management and fiscal accountability
- Adherence to staffing plans, including key personnel clause
- Earned value assessment (or similar analysis) for each task order including cost and schedule variation
- Work element completion targets (within budget and project period)
- Adherence to task order schedule (for milestones and deliverables)
- Attainment of success criteria and quality objectives for both task order outputs and contract outcomes

The metrics listed above are not meant to be comprehensive and are provided as minimum guidance. The Contractor is encouraged to identify additional metrics that are applicable to the management and success of the tasks.

## **4.0 GLOSSARY**

### ***4.1 Acronyms***

Acronym	Definition
COR	Contracting Officer's Representative
EERE	Office of Energy Efficiency and Renewable Energy
EPAct	Energy Policy Act of 2005
DOE	Department of Energy
FE	Office of Fossil Energy
NETL	National Energy Technology Laboratory
OE	Office of Electricity Delivery and Energy Reliability
PEI	Project Execution and Implementation
QA/QC	Quality Assurance/Quality Control
R&D	Research and Development
RD&D	Research, Development and Demonstration
RDD&D	Research, Development, Demonstration and Deployment
SOW	Statement of Work
WBS	Work Breakdown Structure

### ***4.2 Definitions***

Word/Phrases	Definition
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Off-Site	Any location not on one of the NETL sites as defined in “on-site” below.
On-Site	Federally-owned or leased property within the defined boundaries of the sites at Albany, OR; Fairbanks, AK; Morgantown, WV; Pittsburgh, PA; and Tulsa, OK, including, in the case of Morgantown, NETL leased space in the Research Ridge complex immediately adjacent to the boundary.
Program	A program is an organized set of ongoing activities directed toward a common purpose or goal undertaken in support of an assigned mission area. Typically, a program is a group or portfolio of related projects managed in a coordinated way to accomplish broad goals over a relatively long period of time (e.g., a 10 to 15 year planning horizon), to which individual projects contribute.
Project	A project is defined as an individual activity conducted under the laboratories programs and sub-programs. A project is a planned undertaking such as a definitely formulated piece of research.