

PUBLIC VERSION

Final Report Title: Small Modular Reactor (SMR) Long-Term Development Plan: Siting Selection and Technology Study

Name of Grantee: Societatea Nationala Nuclearelectrica S.A.

Name of Contractor/ U.S. Firm: Sargent & Lundy, L.L.C.



This report was funded by the U.S. Trade and Development Agency (USTDA), an agency of the U.S. Government. The opinions, findings, conclusions, or recommendations expressed in this document are those of the author(s) and do not necessarily represent the official position or policies of USTDA. USTDA makes no representation about, nor does it accept responsibility for, the accuracy or completeness of the information contained in this report.



The U.S. Trade and Development Agency

The U.S. Trade and Development Agency helps companies create U.S. jobs through the export of U.S. goods and services for priority infrastructure projects in emerging economies. USTDA links U.S. businesses to export opportunities by funding project preparation and partnership building activities that develop sustainable infrastructure and foster economic growth in partner countries.

The Client, USTDA, and the Commercial and/or Economic Section(s) of the U.S. Embassy in Host Country shall have irrevocable, worldwide, royalty-free, non-exclusive rights to use and distribute the Final Report.

Mailing and Delivery Address: 1101 Wilson Boulevard, Suite 1100, Arlington, VA 22209-2275
Phone: 703-875-4357 • **Fax:** 703-775-4037 • **Website:** www.ustda.gov

Prime Contractor Contact Information

Business Name: Sargent & Lundy, L.L.C.

Point of Contact: Maury Pressburger

Address: 55 E. Monroe St. Chicago, IL 60603

Email Address: Maury.A.Pressburger@sargentlundy.com

Telephone Number: 312-269-2000

Fax Number: N/A

Subcontractor Contact Information

Business Name: Center of Technology and Engineering for Nuclear Projects (CITON)

Point of Contact: Adrian Rizea

Address: 409 Atomistilor Street, Magurele, Iflov, P.O.B 5204-MG-4, Romania

Email Address: citon@router.citon.ro

Telephone Number: +40 21 457 4431

Fax Number: +40 21 457 4431



NUCLEARELECTRICA

**Societatea Nationala Nuclearelectrica (SNN)
SMR Long-Term Development Plan:
Siting Selection and Technology Study**

SMR Siting Assessment Final Report

Report SL-016985

Revision 0

September 29, 2022

S&L Nuclear QA Program Applicable:

Yes

No

55 East Monroe Street
Chicago, IL 60603-5780 USA
312-269-2000
www.sargentlundy.com



LEGAL NOTICE

This deliverable was prepared by Sargent & Lundy, L.L.C. (S&L) expressly for the sole use of Societatea Nationala Nuclearelectrica (SNN) (Client) in accordance with the contract agreement between S&L and Client. This deliverable was prepared using the degree of skill and care ordinarily exercised by engineers practicing under similar circumstances. Client acknowledges: (1) S&L prepared this deliverable subject to the particular scope limitations, budgetary and time constraints, and business objectives of Client; (2) information and data provided by others, including Client, may not have been independently verified by S&L; and (3) the information and data contained in this deliverable are time-sensitive and changes in the data, applicable codes, standards, and acceptable engineering practices may invalidate the findings of this deliverable. Any use or reliance upon this deliverable by third parties shall be at their sole risk.

ISSUE SUMMARY AND APPROVAL PAGES

This is to certify that this document has been prepared, reviewed, and approved in accordance with Sargent & Lundy's Standard Operating Procedure SOP-0405, which is based on ASQ/ANSI/ISO 9001:2015: Quality Management Systems–Requirements.

Prepared by:

Name	Title	Date
Nicholas T. Weidman	Manager	29-Sep-2022

Reviewed by:

Name	Title	Date
Peter A. Carusona	Project Manager	29-Sep-2022
C. Michael Launi	Senior Nuclear Engineer	29-Sep-2022

Approved by:

Name	Title	Date
Maury A. Pressburger	Senior Project Manager	29-Sep-2022

EXECUTIVE SUMMARY

Sargent & Lundy, L.L.C. (Sargent & Lundy) was selected by the U.S. Trade and Development Agency (USTDA) and Societatea Nationala Nuclearelectrica (SNN) to provide technical assistance (TA) related to a proposed Small Modular Reactor (SMR) Project in Romania. A part of this effort, Sargent & Lundy evaluated and provided recommendations on sites and technologies that would be favorable for implementing a first SMR nuclear power plant in Romania. In addition, Sargent & Lundy provided recommendations for siting, technology selection, and licensing. An assessment of the impact on the Romanian economy based on projected project costs was also performed and a summary of United States (U.S.) firms that could provide goods and services to SNN to design, license, and construct an SMR was developed.

The following Tasks were completed in support of the scope of work discussed above:

- Task 1 – Kickoff Meeting and Information Gathering Report (Attachment 1)
- Task 2 – Site Survey Report (Attachment 2)
- Task 3 – Site Selection Report (Attachment 3)
- Task 4 – SMR Technology Assessment Report (Attachment 4)
- Task 5 – Site Licensing Roadmap Report (Attachment 5)
- Task 6 – Development Impact Assessment Report (Attachment 6)
- Task 7 – U.S. Sources of Supply Report (Attachment 7)

TABLE OF CONTENTS

ISSUE SUMMARY AND APPROVAL PAGES	II
EXECUTIVE SUMMARY	III
TABLE OF CONTENTS	IV
ACRONYMS AND ABBREVIATIONS	VI
1. INTRODUCTION	1
2. TASK 1 – KICKOFF MEETING AND INFORMATION GATHERING	2
3. TASK 2 – SITE SURVEY	3
3.1. TASK 2.1 – SITING CRITERIA.....	3
3.2. TASK 2.2 – CANDIDATE AREAS.....	4
3.3. TASK 2.3 – POTENTIAL SITES	4
3.4. TASK 2.4 – CANDIDATE SITES.....	5
3.5. TASK 2.5 – SITE SURVEY REPORT	5
4. TASK 3 – SITE SELECTION STUDY	6
5. TASK 4 – SMR TECHNOLOGY ASSESSMENT	8
6. TASK 5 – SITE LICENSING ROADMAP	9
7. TASK 6 – DEVELOPMENT IMPACT ASSESSMENT.....	10
8. TASK 7 – U.S. SOURCES OF SUPPLY	11
9. RESULTS.....	12

LIST OF ATTACHMENTS

Attachment 1. SL-016286, Rev. 0: Task 1 – Kickoff Meeting and Information Gathering Report

Attachment 2. SL-016453, Rev. 1: Task 2 – Site Survey Report

Attachment 3. SL-016895, Rev. 1: Task 3 – Site Selection Report

Attachment 4. SL-016689, Rev. 0: Task 4 – SMR Technology Assessment Report

Attachment 5. SMR-4346221-ST/R-STS-05, Rev. 0: Task 5 – Site Licensing Roadmap Report

Attachment 6. SL-016662, Rev. 0: Task 6 – Development Impact Assessment Report

Attachment 7. SL-016716, Rev. 2: Task 7 – U.S. Sources of Supply Report

Task 8 – SMR Assessment Final Report

This document contains information that is confidential and proprietary to Sargent & Lundy, (S&L). Please refer to the Legal Notice on Page i of this report.



ACRONYMS AND ABBREVIATIONS

Acronym/Abbreviation	Definition/Clarification
ac	Acre(s)
CNCAN	National Commission for Nuclear Activities Control – Comisia Națională pentru Controlul Activităților Nucleare
CITON	Center of Technology and Engineering for Nuclear Projects
GIS	Geographic Information System
ha	Hectare(s)
IAEA	International Atomic Energy Agency
km	Kilometer(s)
kW	Kilowatt(s)
LCOE	Levelized Cost of Electricity
MWe	Megawatts Electric
NDA	Non-Disclosure Agreement
NEI	Nuclear Energy Institute
PPE	Plant Parameter Envelope
RATEN	Technologies for Nuclear Energy State Owned Company
ROI	Region of Interest
RFI	Request for Information
Sargent & Lundy	Sargent & Lundy, L.L.C.
SME	Subject-Matter Expert
SMR	Small Modular Reactor
SNN	Societatea Nationala Nuclearelectrica
SSG-35	IAEA Safety Standard Series No. SSG-35 “Site Survey and Site Selection for Nuclear Installations,” July 2015

Acronym/Abbreviation	Definition/Clarification
TA	Technical Assistance
U.S.	United States
USTDA	U.S. Trade and Development Agency

1. INTRODUCTION

Sargent & Lundy, L.L.C. (Sargent & Lundy) was selected by the U.S. Trade and Development Agency (USTDA) and Societatea Nationala Nuclearelectrica (SNN) to provide technical assistance (TA) related to a proposed Small Modular Reactor (SMR) Project in Romania. Objectives of the TA include evaluating and providing recommendations on sites and technologies that would be favorable for developing the first SMR nuclear power plant in Romania. Sargent & Lundy's scope of work includes providing recommendations to SNN for siting, technology selection, and licensing.

This Task 8 – SMR Siting Assessment Final Report summarizes the results of the following tasks and includes the attached Task 1 through Task 7 detailed reports, which together, meet the contract requirements:

- Task 1 – Kickoff Meeting and Information Gathering Report
- Task 2 – Site Survey Report
- Task 3 – Site Selection Report
- Task 4 – SMR Technology Assessment Report
- Task 5 – Site Licensing Roadmap Report
- Task 6 – Development Impact Assessment Report
- Task 7 – U.S. Sources of Supply Report

2. TASK 1 – KICKOFF MEETING AND INFORMATION GATHERING

During a kickoff meeting with SNN and Sargent & Lundy on May 6, 2021, Sargent & Lundy presented a preliminary project schedule and worked with SNN to establish the task completion schedule, project work plan, and approach to performing the work.

Sargent & Lundy issued a Request for Information (RFI) to SNN prior to the kickoff meeting (May 4, 2021), which requested relevant background information, documents, and other materials from SNN. The requested information included access to previous nuclear siting studies for Romania, and a high-level overview of the Romanian regulatory process. SNN responded on May 20, 2021.

The Task 1 Report was issued on May 27, 2021, for SNN review. SNN had no comments on the Task 1 Report, which was issued final on June 7, 2021. The Task 1 Report summarized and documented results of the kickoff meeting. Due to its proprietary nature, the Final Report is included as Attachment 1 to the Confidential Version of this report.

3. TASK 2 – SITE SURVEY

Sargent & Lundy developed the Task 2 – Site Survey Report in accordance with the following objectives:

- Identify and evaluate Potential Sites in a systematic, flexible, defensible, and quantitative manner.
- Provide information for use in selecting Candidate Sites with desirable safety, environmental, technical, and economic conditions.

The report includes a summary of findings and a detailed account of work performed under Task 2, including a preliminary site list, siting criteria, the Plant Parameter Envelope (PPE), results of consultations with Romanian Environmental Authorities, geographic information system (GIS) maps, GIS data for Candidate Sites, and a list of Candidate Sites.

3.1. TASK 2.1 – SITING CRITERIA

Sargent & Lundy developed, in consultation with SNN, siting criteria consisting of exclusion criteria and discretionary criteria. Exclusionary criteria include major factors that can make large geographic areas less desirable for siting a nuclear power plant. Applying exclusionary criteria to the site survey allows the assessment to efficiently focus on areas that have the greatest probability of having desirable Potential Sites. Discretionary criteria address potentially challenging factors within a Candidate Area that can be effectively mitigated through practical engineering solutions.

As an element of siting criteria development, Sargent & Lundy developed a PPE for the reactor technologies under consideration using guidance in the Nuclear Energy Institute (NEI) document NEI 10-01. A PPE is a set of reactor- and owner-engineered parameters that are expected to bound the characteristics of a reactor that might later be deployed at a site. The parameters consist of design parameters and site parameters.

Sargent & Lundy compiled a list of water-cooled SMR technologies against the following criteria established by SNN:

- The technology can be licensed or the license is pending (and the technology can be implemented in less than 10 years).
- The technology is a multi-module-type, such that the loss of production for one module does not affect the production from the other reactor-modules or single module, if the existing infrastructure requires.
- The technology has load-following capabilities and is suitable to perform in grids with high percentages of variable renewable energy sources.

- The technology is based on light-water reactor principles due to the large amount of operational experience available in the world for this technology.

Based on the above criteria and publicly available information, including IAEA documentation, SMR vendor websites, and national nuclear regulatory websites, SMR technologies were identified for further evaluation.

An RFI was issued to SMR vendors requesting publicly available information. Sargent & Lundy relied on publicly available information and its siting and reactor technology knowledge and experience to develop bounding parameters to use in the siting survey.

Prior to moving into the next phase of the Project, a Stakeholder Workshop took place on August 31, 2021 and September 1, 2021. The purpose of the Stakeholder Workshop was to provide a high-level summary of the Project, a description of the exclusionary and discretionary criteria, and the proposed methodology for identifying Candidate Sites. This workshop included personnel from Sargent & Lundy, SNN, the Romania Ministry of Environment, CNCAN (National Commission for Nuclear Activities Control), Transelectrica, the Nuclear and Radioactive Waste Agency, and the Romanian Energy Regulatory Authority.

3.2. TASK 2.2 – CANDIDATE AREAS

To identify Candidate Areas within the ROI, Sargent & Lundy, with the support of the Center of Technology and Engineering for Nuclear Projects (CITON), constructed digitized GIS maps of the entire ROI, and reviewed available information from various sources. Sargent & Lundy eliminated areas within the ROI from further evaluation that failed to meet one or more exclusionary criteria.

3.3. TASK 2.3 – POTENTIAL SITES

Potential Sites were identified based on previous studies and by examining Candidate Areas to identify specific locations that appear, based on GIS maps and available aerial photography, to be suitable for nuclear power plant siting.

In addition, the project team identified Potential Sites by applying specific exclusionary criteria to Candidate Areas within all regions of the ROI. Key considerations included the availability of sufficient land suitable for the arrangement of the power plant and other required facilities.

The project team completed a study proposing additional Potential Sites, including locations on the site of partially decommissioned thermal power plants. The Project Team Proposed Sites also took into consideration the fact that the western part of Romania is strongly industrialized, with a strong dynamic of developing cities and localities.

3.4. TASK 2.4 – CANDIDATE SITES

Sargent & Lundy applied the processes and guidelines in the IAEA Safety Standard SSG-35 “Site Survey and Site Selection for Nuclear Installations,” July 2015 (SSG-35), to identify Candidate Sites, including the guidelines for the development of the survey criterion that will be used to identify preferred and alternative Candidate Sites as part of Task 3.

Sargent & Lundy evaluated the Potential Sites against the exclusionary and discretionary criteria to identify sites meeting all exclusionary criteria and to assess the major positive and negative attributes that would affect their suitability for a nuclear power plant.

The application of the exclusionary criteria eliminated Potential Sites. Next, Sargent & Lundy applied the discretionary criteria, which led to the final Candidate Sites.

3.5. TASK 2.5 – SITE SURVEY REPORT

Sargent & Lundy prepared and delivered a draft report to SNN that contained the findings and a detailed account of work performed under Task 2, including a preliminary site list, siting criteria, the plant parameter envelope, GIS maps, a ranking of potential sites, GIS data for candidate sites, and a list of candidate sites.

The Task 2 – Site Survey Report was issued to SNN for review and comment on August 21, 2021. Comments from SNN were received on September 9, 2021, and the final Report was issued on October 5, 2021. A revision to the report was issued to incorporate editorial changes. Due to its proprietary nature, the Final Report is included as Attachment 2 to the Confidential Version of this report.

4. TASK 3 – SITE SELECTION STUDY

In Task 3, Sargent & Lundy refined the sites identified as Candidate Sites in Task 2 into specific sites to evaluate in greater detail. This included moving sites by a distance of up to two kilometers (km).

The sites were evaluated to determine the area of land that is potentially suitable for the construction of the proposed SMR facility. These sites were then compared to the total area required for the SMR technologies based on the PPE information provided by the vendors for the Task 2 Report.

Site layouts were developed based on the PPE established in Task 2, aerial imagery, and topographic data and the candidate sites have sufficient area based on the PPE responses provided by the SMR vendors in Task 2.

The primary objective of Task 3 is to evaluate the candidate sites through a ranking and comparison process in accordance with IAEA SSG-35 (July 2015). As part of this process, each site was assessed for concerns with a given site or fatal flaws that would prevent construction and operation of the SMR, and the sites were ranked in order of their suitability for Project development.

Candidate Sites described in Section 3 were examined in detail to determine whether any have significant or unique infrastructure, engineering, environmental, or socioeconomic issues that would make them impractical or otherwise less desirable for development of the SMR. Candidate Sites were evaluated for Project development considerations, including:

- Safety-Related Criteria – Natural Hazards
- Safety-Related Criteria – Human-Induced Hazards and Nuclear Security
- Safety-Related Criteria – Radioactive Material and Emergency Planning
- Non-Safety-Related Criteria

The ranking criteria in the above four categories include 47 site characteristics related to public safety, nuclear security, nuclear fuel production licensing requirements, environmental impact, and engineering requirements. Each characteristic is defined as part of the exclusionary criteria (required) or discretionary criteria (desired). In addition, the ranking criteria evaluated were primarily technical and environmental, combined with some qualitative assessments of the nuclear regulatory and social impacts.

Quantitative criteria were developed to generate numerical scores that reflect how well each site satisfied the discretionary criteria for each of the 47 site characteristics. The criteria included both an objective means of assigning a numerical score for each site characteristic and importance weighting factors, which

were used to adjust the numerical scores based on the relative importance of the site characteristics. The possible score on each site characteristic ranged from 1 to 5, and each importance weighting factor ranged from 1 to 10.

Detailed information was collected on environmental and technical conditions at each site and assessed and scored based on an evaluation of selected site criteria. Potential site locations that failed to meet one or more exclusionary criterion were subjected to further consideration; whereas discretionary criteria included within the ranking criteria were evaluated for significance. In general, discretionary criteria were evaluated to determine whether they had the potential to introduce adverse technical, safety, environmental, or licensing impacts.

The sites were ranked based on the weighted scores determined for each of the 47 criteria. The scores ranged from 73% to 62% of the maximum possible score and the report identified several preferred sites.

The Task 3 – Site Selection Report summarizes the results of the site ranking process and identifies Preferred Candidate Sites for future evaluation. The report was issued to SNN for review and comment on April 19, 2022. Comments from SNN were received on April 28, 2022. The Task 3 Report was issued for final review on May 13, 2022, and the final Report was issued on May 19, 2022. A revision to the report was issued to incorporate editorial changes. Due to its proprietary nature, the Final Report is included as Attachment 3 to the Confidential Version of this report.

5. TASK 4 – SMR TECHNOLOGY ASSESSMENT

The purpose of Task 4 was to develop a SMR technology assessment to assist SNN in evaluating SMR technologies based on commercial, contractual, and technical criteria currently deemed important to SNN and based on the current status of SMR technologies.

Sargent & Lundy worked with SNN to develop six categories and 56 criteria for evaluation along with inquiries to each of the vendors related to each of the criterion. These inquiries were submitted via an RFI to the SMR technology vendors. There were delays in responses since each of the vendors required an executed three-way Non-Disclosure Agreement (NDA) with SNN and Sargent & Lundy prior to submittal of the information.

Prior to receiving RFI responses from the vendors, Sargent & Lundy and SNN worked collaboratively to establish criteria weighting and scoring guidelines. Upon receipt of vendor responses on December 1, 2021, Sargent & Lundy utilized subject-matter experts (SMEs) to evaluate the responses from each of the vendors and score their responses per the established scoring guidelines. The overall ranking for the SMR technologies was then computed as the sum of the weighted average of the composite rankings for the technology assessment criteria. Sargent & Lundy discussed the scoring with SNN through several collaboration meetings to ensure alignment. Due to the dynamic nature of both the commercial and regulatory developments in the nuclear industry; an input data freeze date of March 7, 2022, was established for this evaluation.

Sargent & Lundy prepared the SMR Technology Assessment Report that contains the findings and a detailed account of work performed under Task 4. The purpose of the report was not to select or recommend the final SMR technology, but rather to evaluate the technologies available to determine which SMR technologies may be more favorable than others, based on the criteria identified by Sargent & Lundy and SNN.

The Task 4 – SMR Technology Assessment Report was issued to SNN for review and comment on March 16, 2022. Comments from SNN were received during an April 6, 2022 review meeting and the final Report was issued on May 3, 2022. Due to its proprietary nature, the Final Report is included as Attachment 4 to the Confidential Version of this report.

6. TASK 5 – SITE LICENSING ROADMAP

Task 5 was prepared by CITON with oversight and acceptance by Sargent & Lundy, as documented by this Task 8 Report. The Task 5 Report summarizes the activities required to license a site on which the building of SMRs is intended.

The licensing roadmap provides the 28 required tasks, including studies, site surveys, reports, and analyses required by applicable local Romanian and international regulations. The roadmap also provides a sequence of activities needed after site selection to obtain the site license and a Level 4 cost estimate and estimated duration for each of these activities.

The initial Task 5 – Site Licensing Roadmap was issued to SNN for review and comment on November 11, 2021. Initial comments from SNN were received on November 22, 2021. Additional follow up meetings with SNN were held in December 2021 and January 2022 to further develop the Site Licensing Roadmap and required document submittals. SNN final review and acceptance of the Task 5 Report was conducted in January 2022. The final Report was issued on February 1, 2022. Due to its proprietary nature, the Final Report is included as Attachment 5 to the Confidential Version of this report.

7. TASK 6 – DEVELOPMENT IMPACT ASSESSMENT

To complete Task 6, Sargent & Lundy first developed an estimate of the total overnight capital cost for the development of an SMR project in Romania on a dollars per kilowatt basis. This estimate was developed based on Sargent & Lundy's experience in the nuclear power industry and benchmarked against publicly available and private cost estimates of the SMR vendors evaluated in Task 4. Cost estimates included capital costs, engineering, procurement, and construction costs, and other owner's costs.

Sargent & Lundy then assessed the development impacts created by the Project, if implemented, by identifying the economic impact within Romania and developing a detailed methodology for measuring those impacts, including direct, indirect, and induced impacts.

The assessment also considered how the development impact can be measured and the anticipated benchmarks and timelines for achieving the development impact measures.

The initial Task 6 – Development Impact Assessment Report was issued to SNN for review and comment on December 29, 2021. Initial comments from SNN were received on November 11, 2022. As a result of comments from SNN and subsequent discussions between SNN and Sargent & Lundy, RFIs were issued to the SMR technology vendors identified in Task 4, on March 22, 2022. The RFIs requested that the SMR vendor provide their Levelized Cost of Electricity (LCOE) to confirm the LCOE range determined by publicly available information. The responses to the RFIs were received from the SMR vendors between March 28, 2022, and April 29, 2022. The Task 6 Report was updated and issued for final review to SNN on May 4, 2022. The final Report was issued on May 12, 2022. Due to its proprietary nature, the Final Report is included as Attachment 6 to the Confidential Version of this report.

8. TASK 7 – U.S. SOURCES OF SUPPLY

To complete Task 7, Sargent & Lundy performed a study to identify U.S. sources of supply for all goods and services required to implement an SMR in Romania. The study includes detailed information about the prospective U.S. exporters, potential goods and services, and how U.S. exporters could participate in project implementation. The study focuses on major equipment and major services, including companies from the following areas:

- Engineering firms
- Potential goods for U.S. equipment manufacturers
- Construction firms
- Operations and maintenance firms
- Other professional service firms of a substantial nature (e.g., legal, finance)

The report identifies U.S. companies that could support the development and operation of an SMR in Romania based on available metrics. Also, the type of major equipment likely to be required to construct an SMR is listed.

This report was funded by the U.S. Trade and Development Agency (USTDA), an agency of the U.S. Government. As such, the USTDA requested Task 7 be included to provide information on potential opportunities for U.S. suppliers. The intention of Task 7 is not to limit potential suppliers of goods and services to the U.S.

The Task 7 – U.S. Sources of Supply Report was issued to SNN for review and comment on January 12, 2022. SNN had no comments on the Task 7 Report, which was issued final on February 1, 2022. The final Report is included as Attachment 7 to this report.

9. RESULTS

Sargent & Lundy collaborated with SNN to ensure the dynamic processes involved with these evaluations continued to meet SNN's priorities for a potential SMR Project in Romania. Sargent & Lundy's scope of work included providing evaluations to SNN for siting, technology selection, licensing, and economic impact.

With the completion of Task 2 and Task 3, the first two stages of the siting process for a nuclear installation, as described in SSG-35, have been completed: (1) Site Survey, in which Candidate Sites are identified after the investigation of a large region and the rejection of less desirable sites; and (2) Site Selection, in which the candidate sites are assessed by screening, evaluation, comparison, and ranking on the basis of safety and other considerations to select one or more Preferred Candidate Sites. Completion of Task 3 resulted in sites that are all viable for proceeding to the Site Evaluation process and could be suitable for the reactor technologies evaluated. The scope of the Site Evaluation process as per IAEA Specific Safety Requirements No. SSR-1, "Site Evaluation for Nuclear Installations," should include factors relating to the site and factors relating to the interaction between the site and the proposed nuclear technology, for all operational states and accident conditions, in particular accidents that could warrant emergency response actions.

Task 4 evaluates light-water reactor SMR technologies based on responses provided by the SMR vendors to Sargent & Lundy's RFI. The evaluation provides rankings of the technologies based on their current status and SNN's current priorities. The evaluation provides a tool that can be updated in future evaluations based on new information from vendors or changes in weighting factors. The final reactor technology and vendor selection should be based on inputs from this report, combined with other evaluations and commercial discussions being performed by SNN.

Task 5 documents the steps required to license an SMR in Romania, including reports and interfaces required, along with an estimated cost and duration for these activities.

Task 6 estimates the potential positive impacts to the Romanian economy during the development, construction, and operation of a new SMR through construction and operation jobs, as well as tax benefits. However, success of the Project hinges on the ability of the Project stakeholders to integrate with international suppliers of goods and services and to gain the necessary experience and knowledge needed over a long-term horizon.

Task 7 provides a representative list of U.S. firms that can provide engineering, manufacturing, construction, O&M support, and other professional services as needed to support successful Project

Task 8 – SMR Assessment Final Report

This document contains information that is confidential and proprietary to Sargent & Lundy, (S&L). Please refer to the Legal Notice on Page i of this report.



implementation that would ultimately lead to an autonomous nuclear industry within Romania. As this report was funded by the U.S. Trade and Development Agency (USTDA), an agency of the U.S. Government, Task 7 provided information on potential opportunities for U.S. suppliers. The intention of Task 7 is not to limit potential suppliers of goods and services to the U.S.

Sargent & Lundy's technical assistance to SNN has helped to facilitate a path to further evaluate shortlisted sites and technologies and to better identify activities required to license and construct Romania's first SMR.

**ATTACHMENT 1. SL-016286, REV. 0:
TASK 1 – KICKOFF MEETING AND INFORMATION
GATHERING REPORT**

ATTACHMENT NOT INCLUDED IN PUBLIC VERSION OF REPORT

ATTACHMENT 2. SL-016453, REV. 1: TASK 2 – SITE SURVEY REPORT

ATTACHMENT NOT INCLUDED IN PUBLIC VERSION OF REPORT

ATTACHMENT 3. SL-016895, REV. 1: TASK 3 – SITE SELECTION REPORT

ATTACHMENT NOT INCLUDED IN PUBLIC VERSION OF REPORT

**ATTACHMENT 4. SL-016689, REV. 0:
TASK 4 – SMR TECHNOLOGY
ASSESSMENT REPORT**

ATTACHMENT NOT INCLUDED IN PUBLIC VERSION OF REPORT

**ATTACHMENT 5. SMR-4346221-ST/R-STS-05,
REV. 0: TASK 5 – SITE LICENSING
ROADMAP REPORT**

ATTACHMENT NOT INCLUDED IN PUBLIC VERSION OF REPORT

**ATTACHMENT 6. SL-016662, REV. 0:
TASK 6 – DEVELOPMENT IMPACT
ASSESSMENT REPORT**

Task 8 – SMR Assessment Final Report

This document contains information that is confidential and proprietary to Sargent & Lundy, (S&L). Please refer to the Legal Notice on Page i of this report.



ATTACHMENT NOT INCLUDED IN PUBLIC VERSION OF REPORT

ATTACHMENT 7. SL-016716, REV. 2: TASK 7 – U.S. SOURCES OF SUPPLY REPORT

Task 8 – SMR Assessment Final Report

This document contains information that is confidential and proprietary to Sargent & Lundy, (S&L). Please refer to the Legal Notice on Page i of this report.

