Economic Impact Report

Construction and Operation of a Small Modular Reactor Electric Power Generation Facility at the Idaho National Laboratory Site, Butte County, Idaho

Prepared for:

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Section 1: Executive Summary

Project Overview

As part of its Carbon Free Power Project (CFPP) initiative, launched in 2015, Utah Associated Municipal Power Systems (UAMPS) is undertaking, along with NuScale Power LLC, licensing and development actions for the development of a Small Modular Nucelar Reactor (SMR) facility in eastern Idaho (the Project). The U.S. Department of Energy issued a Site Use Permit to UAMPS for access to the at the Idaho National Laboratory (INL) site for the facility. The power plant will consist of twelve NuScale SMR modules, each rated at producing 47 megawatts (MW). The NuScale 12-pack of SMR modules will have a rated capacity of 570 MW of power from the facility. The projected start date of the commencement of work on-site in eastern Idaho is projected to be the second half of 2021 with an expected commercial operation date of 2026.

Overview of the Economic Impact Analysis

This study employs IMPLAN, the most widely used economic impact analysis model in the United States to estimate the increased output (sales), gross regional product, employment, employee compensation and tax revenues resulting from the construction and operations of the project. The analysis measures the estimated impacts arising from the manufacturing and construction of the NuScale 12-pack that occurs within the regional economy. Expenditures occurring outside the region are excluded from the analysis. The construction period is estimated be four-years. After construction and connection to the power grid, the facility will generate ongoing economic and fiscal impacts each year over the lifetime of the plant. Employment, operations and maintenance data for the NuScale 12-pack power plant are utilized to estimate the impacts from ongoing plant operations.

Based on studies of the regional extent of employment, purchasing, and other activities at of the Idaho National

	Labs (INL) site, this study estimates the fiscal and economic impacts in eastern Idaho regional economy which consists of Bannock, Bear Lake, Bingham, Bonneville, Butte, Caribou, Clark, Custer, Franklin, Fremont, Jefferson, Lemhi, Madison, Oneida, Power and Teton counties. County-level economic data are aggregated to create the eastern Idaho regional economy used in the economic modeling. Identification of the county-level supply chain, including the labor and materials derived in Idaho, is ongoing and has yet to be publicly identified. As a result, the impacts estimated in this analysis are provided for the eastern Idaho regional economy.
Project Development Schedule	The Project has an expected construction period of four years and the economic impacts from the construction of the facility are reported on an annual basis. It is anticipated that construction will be complete in 2025 with limited power production and full commercial operation of all 12 SMR modules will commence in 2026. As the sequencing of the power module grid connection has not been made public, this analysis assumes that the economic impacts from construction cease four years after commencing and that the impacts from operations commence the following year. Given that the projected life of the facility is 40 years, the economic and fiscal impacts from commercial power production at the facility will be long lasting. These impacts may well last for a longer period as it is anticipated that the initial licensing period of 40 years is likely to be extended for another 20 years, as is common with US nuclear power plants.
Annual Economic and Fiscal Impacts	The Project's economic and fiscal impacts stem from the construction activities as well as ongoing operations of the facility. The Project will create an annual total of 2,000 direct jobs at the site and an additional 1,356 jobs from the indirect and induced economic effects off-site (see Section 3 for an explanation of these direct, indirect, and induced economic impacts). Thus,

the construction of the facility will create an additional 3,356 total jobs in the region each year over the *four-year* construction period. In addition, the project will add $161.05 million in labor income, and $516.41 million in increased economic output (sales) each year. State and local tax revenues will increase by $15.6 million as well as $36.0 million federal tax revenues annually during the construction period.

The economic impacts from the operations of the power plant are estimated to create 360 direct jobs at the site annually and, with the indirect and induced effects, will add a total of 667 jobs in the region each year over the lifetime of the facility. The operations of the plant are estimated to increase labor income in the region by nearly $48 million, increase economic output in the region by an estimated $81.15 million, and add $5.81 million to local and state tax revenues and $11.25 million to federal tax revenues annually.

Cumulative Construction Economic and Fiscal Impacts

Cumulatively, the Project will create a total 13,422 job years in the region over the four-year construction period. In addition, these activities are estimated to increase labor income in the region by $644.18 million and add over $2 billion in increased output in the region over the construction period. Further, construction at the site will increase state and local tax revenues by over $62 million as well as $144.25 million federal tax revenues during the construction period.

Organization of this Report

The report is organized as follows:

- Section 2 contains a brief overview of the Project being analyzed in this report and the general approach of the economic analysis employed.
- Section 3 presents principal results of the economic analysis, including estimated increases in employment, labor income, gross regional product (value-added), and economic output (sales) stemming from the construction and operations of the NuScale power plant at the

INL site. In addition to these economic impacts, detailed estimates of the increases in tax revenues, including local property tax, sales and excise taxes, and individual and corporate income tax revenues. This section also provides summary tables of the increases in employment, earnings, output, and tax impacts for the eastern Idaho region. This study also estimated the impacts at the state of Idaho level but, because nearly all of the estimated economic and fiscal impacts from the NuScale power plant at the INL site accrue to the eastern Idaho regional economy, the impacts at the state level are only marginally different from those at the regional level.

- Section 4 discusses the methodology used in this analysis, including a brief description of the input-output techniques used to obtain the estimated economic and fiscal impacts reported here.
- Section 5 presents the highlights of the economic impacts estimation. Summaries of the Project's effects on employment, labor income, output and tax revenues are presented. Finally, the limitations inherent in this analysis are briefly discussed.

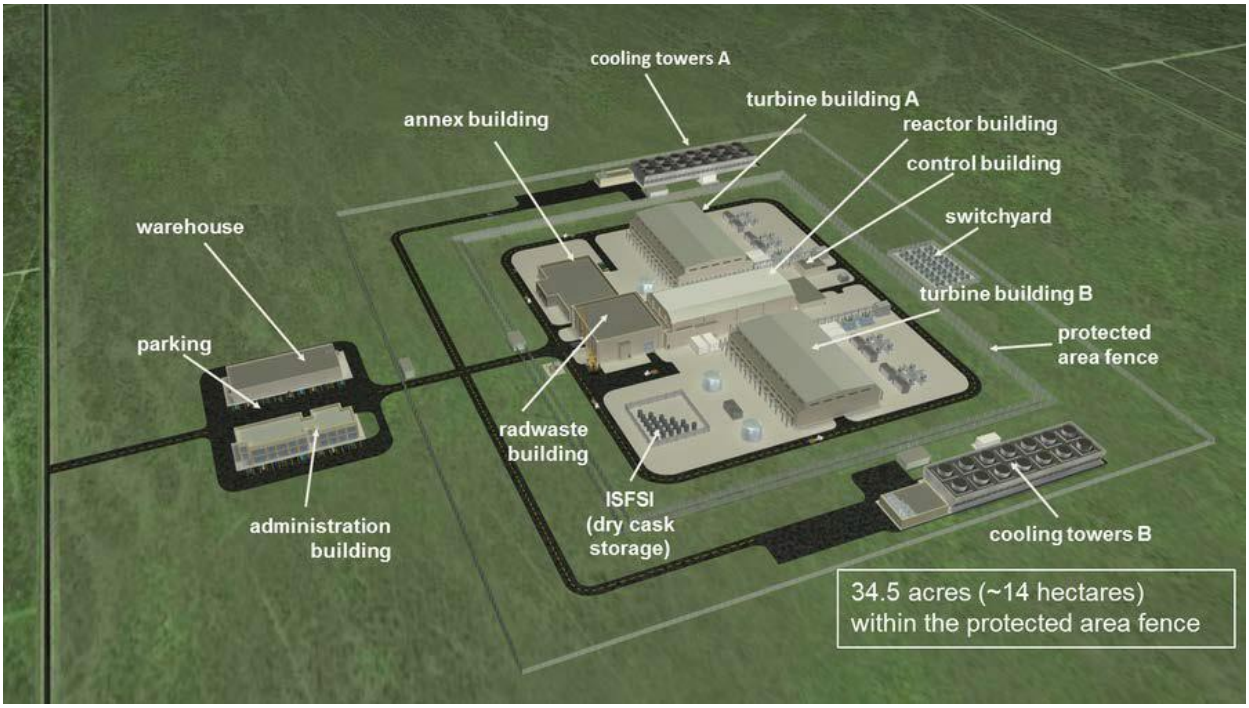
Section 2: Project Overview

Summary of Proposed Project

As part of its Carbon Free Power Project (CFPP) initiative, Utah Associated Municipal Power Systems is proposing a Small Modular Reactor power generation facility to be located at the Idaho National Laboratory site in eastern Idaho. This facility will consist of twelve SMR modules from NuScale Power, LLC. Each of these power modules have a rated capacity of 47 MWe for a total of nearly 570 MWe. The facility is intended to produce baseload power for UAMPS, which is interested in, among other factors, developing carbon-free replacement power for its existing coal-fired power plants that are due to retire within the next several years as well as to comply with additional energy markets.

NuScale Power has designed a pressurized-light-water reactor module that is intended to meet customer's energy demands by combining up 12 power modules in a single plant. Figure 1, below, illustrates the proposed 12-module power analyzed in this study.

Figure One: NuScale Power Plant Site Area



There are several advantages of SMR technology and, in particular, the NuScale SMR design. In addition to producing carbon-free baseload power, these advantages include increased safety due to passive heat removal, simplified design, and below-grade placement of the reactor

vessels. In addition, there are economic advantages including reduced construction costs, construction duration, and reduced financial risk. These benefits associated with SMR technology have elicited the support of the US Department of Energy (DOE). In addition to early cost-sharing funding to further progress the NuScale design, the US DOE has more recently provided significant funding awards to NuScale to conduct design finalization activities, ensure supply chain readiness, and fulfill licensing requirements for the CFPP in eastern Idaho. In addition, the US DOE issued a Site Use Permit to UAMPS for the use of the INL site for the NuScale power plant. A combined construction and operating license application (COLA) was submitted to the US Nuclear Regulatory Commission (NRC) in 2017 with completion of the COLA process expected in 2018. Current projections are for construction activities to begin at the INL site in 2021 with full operation of the NuScale 12-pack by 2026.

Summary of Construction and Operations Costs Used in This Analysis

To date, no SMR design has been commercially produced, creating uncertainty regarding the construction costs and commercial viability of this technology. To reduce this uncertainty, the researchers conducting this study recently estimated the costs of manufacture and construction of SMR designs in general and the NuScale design specifically. This was part of a study conducted for NuScale Power by the Energy Policy Institute, part of the Center for Advanced Energy Studies (CAES) at INL. The research utilizes the common cost accounting system, termed the uniform Code of Accounts (COA) system of the U.S. Department of Energy (DOE). This cost-accounting system has been used for several years to estimate the costs of large nuclear power plants and provide cost comparisons across nuclear and other energy producing technologies. The COA system is designed to be flexible enough to accommodate cost estimates for virtually any nuclear power design as well as for cost comparisons of nuclear plants with conventional large-scale electrical power generation facilities. This system is used in this study to delineate expenditures for the manufacturing of SMR power modules and construction. A brief description of the estimation method used for impacts stemming from plant operations is provided below.

Construction Costs. The Codes of Account for the categories of expenditures on the manufacturing and construction of nuclear power plants are given below in Table One. In the COA system, there are two major types of cost categories, Account 20 (Direct Capital Costs) and Account 30 (Indirect Capital Costs). For each of these, there are several two-digit sub-accounts. Within each of these accounts, there are several three-digit sub-accounts to provide greater detail. In the cost estimation study performed for the NuScale design, the analysis estimated costs at a level of detail commensurate with the three-digit sub-accounts level. In many categories, the level of detail for expenditures was even more granular than the three-digit level. The following table shows the two and three-digit codes of account for the Capitalized Direct Costs and Capitalized Indirect Costs for nuclear power plants. These are the expenditure categories used in the analysis of the economic impacts stemming from the construction activities of the NuScale Power Plant in eastern Idaho.

Table One: Major Codes of Account for Construction Cost Estimation

One Digit Accounts	Two Digit Sub-Accounts	Three Digit Sub-Accounts
20 Capitalized Direct Costs		
	21 Structures & Improvements	
		211 Site Prep & Yard Work
		212 Reactor Building
		213 Turbine Generator Buildings
		214 Security Building
		215 Reactor Services Building
		216 Radioactive Waste Building
		218 Other Buildings
	22 Reactor Plant Equipment	
		221 Reactor Equipment
		223 Safety Systems
		225 Fuel Handling System
		227 Reactor Instrumentation and Control
	23 Turbine Plant Equipment	
		231 Turbine Generators
		233 Condensing System
		234 Feed Heating System
		236 Turbine Generator Instrumentation
	24 Electric Plant Equipment	
		241 Switchgear Generator Equipment
		246 Power & Control Cables & Wiring
	25 Heat Rejection System	
		251 Structures
		252 Mechanical Equipment
	26 Miscellaneous Plant Equipment	
		261 Transportation & Lift Equipment
		262 Air, Water, Plant Fuel Oil & Steam Service Systems
		263 Communications Equipment
		264 Furnishings & Fixtures
		265 Wastewater Treatment Equipment
30 Capitalized Indirect Costs		
	31 Design Services at Home Office	
	34 Field Construction Management	
	35 Field Construction Supervision	
	36 Field Indirect Supervision Costs	

Table 2 below, shows the relevant accounts in the COA system with cost estimates for the NuScale SMR aggregated at the two-digit sub-account level. As described above, these cost estimates were determined by a separate study on SMR direct and indirect costs conducted by the Energy Policy Institute in 2016. These estimates provide critical cost information utilized in this analysis for impacts estimation for construction activities for the NuScale power plant.

Table Two: Major Codes of Account and Estimated NuScale Costs

Code of Account	General Description	NuScale SMR Cost
20	**Capitalized Direct Costs**	**$1,805,616,142**
21	Structures and Improvements	$612,136,797
22	Reactor Plant Equipment	$869,360,876
23	Turbine Plant Equipment	$196,121,808
24	Electric Plant Equipment	$34,982,052
25	Heat Rejection Systems	$62,934,255
26	Miscellaneous Plant Equipment	$30,080,354
30	**Capitalized Indirect Costs**	**$663,710,610**
31	Design Services at Home Office	$130,978,572
34	Field Construction Management	$60,906,859
35	Field Construction Supervision	$246,930,385
36	Field Indirect Costs	$224,894,794
	Total Manufacture and Construction Costs	**$2,469,326,752**

As a result of the 2016 study, these direct and indirect cost estimates are the current public release figures being cited by NuScale for the manufacturing and construction costs of the NuScale 12-pack power plant.

It is important to note that, because of the modular design of the NuScale SMR, only part of the above costs will occur at the INL site. For example, the SMR reactor modules will be manufactured elsewhere and shipped to the INL site. Thus, only part of the costs associated with the manufacturing and construction activities for structures and improvements, reactor, turbine, and electric plant equipment, and heat rejection systems will create jobs and other economic impacts in southeast Idaho. For each of these direct cost categories, the amount of costs to be sourced or originating within Idaho were estimated by NuScale Power. Similarly, NuScale Power validated the cost estimates determined by the 2016 study for Capitalized Indirect Costs. For the Indirect Cost codes of account, all of the expenditures listed in Account 34 (Field Construction Management), Account 35 (Field Construction Supervision) and Account 36 (Field Indirect Costs) are estimated to within southeast Idaho. Note of the expenditures listed in Account 31 (Design Services at Home Office) are determined to occur within Idaho.

The Direct and Indirect Cost expenditures for the NuScale Power Plant determined to be sourced or originating within Idaho are shown below in Table 3.

Table Three: Estimated NuScale Costs and Expenditures Occurring Within Idaho

Code of Account	General Description	NuScale SMR Cost	Expenditures Sourced or Originating Within Idaho
20	**Capitalized Direct Costs**	**$1,805,616,142**	**$744,613,813**
21	Structures and Improvements	$612,136,797	$422,374,390
22	Reactor Plant Equipment	$869,360,876	$234,727,437
23	Turbine Plant Equipment	$196,121,808	$52,952,888
24	Electric Plant Equipment	$34,982,052	$9,445,154
25	Heat Rejection Systems	$62,934,255	$16,992,249
26	Miscellaneous Plant Equipment	$30,080,354	$8,121,696
30	**Capitalized Indirect Costs**	**$663,710,610**	**$663,710,610**
31	Design Services at Home Office	$130,978,572	$0
34	Field Construction Management	$60,906,859	$60,906,859
35	Field Construction Supervision	$246,930,385	$246,930,385
36	Field Indirect Costs	$224,894,794	$224,894,794
	Total Manufacture and Construction Costs	**$2,469,326,752**	**$1,408,324,423**

As shown above in Table 3, of the estimated $2.469 billion cost for manufacturing and construction activities for the facility, actual construction expenditures at the INL site are estimated to be $1.408 billion, or 57% of the total manufacture and construction cost for the NuScale Power Plant. It is this estimate that is used to determine the economic impacts for construction.

Operations and Maintenance (O&M). The IMPLAN model used in this analysis can estimate the economic impacts from nuclear plant operations based on direct labor used, expenditures on operations and maintenance, as well as revenue from electricity sales. The latter approach is not appropriate here because most of the electricity produced from the NuScale Power Plant will be purchased by out-of-state consumers. As a result, this study used the direct jobs and expenditures approaches to obtain estimates of the economic and fiscal impacts stemming from the O&M activities of the facility.

In terms of the direct labor approach, this study used an estimated 360 jobs annually, as provided by published reports from NuScale, to estimate the annual economic and fiscal impacts from ongoing O&M activities. Further, this study employed data provided by NuScale on operations and maintenance expenditures for the facility. As with the manufacture of the power modules themselves, the nuclear fuel for the facility will be manufactured elsewhere and shipped to the power plant. As a result, the expenditures on the facility's nuclear fuel will not increase economic activity in the region and are excluded from the impacts estimation from power plant operations and maintenance. Similarly, a portion of the non-fuel operations and maintenance costs will be spent on materials not sourced from within Idaho. Based on estimates provided by NuScale, the non-fuel operations and maintenance expenditures to be sourced or originating from within Idaho are estimated to be $45,560,000 annually.

The direct jobs and estimated O&M expenditures provide the basis for the estimates of the economic and fiscal impacts from plant operations and maintenance activities. These, along with the estimated from the construction activities at the site, are presented below in Section 4 of this report. The following section provides a brief overview of the types of impacts estimated n this study and the methodology employed.

Section 3: Overview of Economic Methodology

Being located at the Idaho National Laboratory, already one of the largest employers in the state, the proposed SMR facility will generate even more economic activity in the region and be a source of substantial job creation as well as increases in economic output tax revenues both locally and for the state. As described above, these impacts from the SMR power plant at the INL site stem from the construction activities during the four-year construction period as well as the ongoing activities of plant operations. In each case, the economic and fiscal impacts consist of three types of economic activity. In the language of Input-Output (I-O) analysis, there are three types of impacts pertinent to this type of analysis. The first are termed *direct effects*. These stem from the wages and salaries to employees of the facility or other firms directly involved in the construction or operation of the plant. In addition, direct effects stem from the purchases from local suppliers for construction or operations activities. *Indirect effects* stem from the purchases these local suppliers to the facility make to other local suppliers. For example, when equipment is purchased from a firm doing business directly with the facility, that company must then purchase its inputs from others. The employment, income, and output that come from these inter-industry effects constitute the *indirect effects*. Subsequent economic impacts occur when households that receive income from either the facility or from the supplying firms make purchases of goods and services. These are termed the *induced effects*. For example, when employees of the facility and the supplying firms spend their income on items such as food, clothing, entertainment and automobiles, these purchases will stimulate economic activity throughout the study area's economy. These avenues of economic impacts, direct, indirect, and induced effects, are well known and can be accurately estimated using I-O analysis.

The direct, indirect and induced effects cumulatively constitute the total impacts of the facility on employment, personal income and total output in the study area. This study estimates these impacts on the counties in the eastern Idaho region surrounding the INL site as well as the economy of the state. This analysis employs a sophisticated I-O model, known as IMPLAN, originally developed for estimating the effects of government operations and has since been refined for analyzing a wide variety of economic activity by both the private and public sectors, including business operations, capital investments, administration and management activities, government grants and government-sponsored research operations. As a result, it is ideally suited for the type of economic analysis undertaken in this study.

The IMPLAN model disaggregates the Idaho economy into 536 industrial sectors, including several state and local government sectors, to account for the flows of activity throughout the Idaho economy. By so doing, the economic and fiscal impacts stemming from the construction of the facility and its ongoing operations can be estimated. The IMPLAN model tracks the effects of employment and wages paid to employees of the power plant and firms directly involved in the construction of the facility, as well as purchases from Idaho suppliers. It also tracks the

effects of the purchases made by these employees throughout the Idaho economy. In effect, the model calculates the direct, indirect, and induced effects on employment, labor income, and output for each type of spending by the facility. The I-O model used for this study provides data on the economic structure of each county in the state and is therefore able to analyze the impacts on the eastern Idaho region as well as on the state.

This study first determines the amounts and types of spending on construction activities at the facility. As described in Section 2 of this report, these amount to $1.408 billion in expenditures occurring in the eastern Idaho region. It is important to note that this is money spent in Idaho. This volume of spending will generate the direct effects for the overall economy of the region. Wages paid to employees who reside outside Idaho were not included in this study. Similarly, expenditures on good and services made to firms outside the state are not included here. While these would be included in determining the facility's impacts nationally, they are excluded from this regional analysis.

It is important to note that the economic and fiscal impacts stemming from the construction activities at the site only occur during the facility's four-year construction period. Subsequent to the construction of the facility, the same type of impacts also occur on an ongoing basis due to the ongoing operations of the power plant. Payments by the facility to its 360 direct employees as well expenditures paid to local suppliers constitute the direct effects from the ongoing operations and maintenance activities of the NuScale Power Plant. In addition, there are indirect and induced effects that cumulatively constitute the overall impact of the power plant's continuing operation and maintenance activities.

The economic impacts estimated here consist of the increases in employment, labor income, gross regional product (value added), and output (sales) from the construction and operations of the facility. Employment consists of the increased number of full time jobs. Labor income consists of the increases in wages and salaries. Value-added is analogous to the calculation of gross domestic product at the national level but is here confined to the region being analyzed here. Finally, output reflects the increase in total economic activity, often referred to as total sales, arising from the activities of the facility. The IMPLAN model estimates the direct, indirect, and induced effects for each of these types of economic impacts. In addition, the model estimates the increases in local, state, and federal taxes arising from the construction and operation of the power plant. These consist of increases property, sales and excise, individual and corporate income tax revenues at the federal as well as the state and local level. In addition, estimates are provided for increased local property tax revenues. These fiscal impacts, along with the estimated economic impacts, are summarized in the following section.

Section 4: Economic and Fiscal Impacts of Construction and Plant Operations

Summary of Economic Impacts from Construction Activities

The economic impacts from the construction of the Project are significant, especially in the relatively rural eastern Idaho region.

On an annual basis, Table 4 below shows the estimated economic impacts arising from the direct, indirect, and induced effects for the construction of the SMR power plant at the INL site in eastern Idaho in each type of impact for every year of the construction period.

Table Four: Annual Economic Impacts for Construction

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	2,000	$111,398,774	$201,182,294	$352,081,106
Indirect Effect	521	$22,435,533	$34,970,369	$71,424,367
Induced Effect	834	$27,211,149	$47,300,779	$92,900,217
Total Effect	3,356	$161,045,455	$283,453,442	$516,405,689

As can be seen in the above table, 2,000 workers will be directly employed each year during the four-year construction of the facility with increased labor income amounting to over $111 million annually. The indirect and induced economic effects of the construction activities will yield an additional 1,356 jobs and increased labor income of nearly $50 million. Overall, the construction of the power plant will account for increased employment of 3,356 jobs and increased labor income of over $160 million annually in the eastern Idaho region.

In addition to job creation and increased labor income, the construction of the facility will increase gross domestic product in the region by a total of $283.4 million annually and overall economic activity by over $516 million annually. These are all highly significant additions to the regional economy. As seen from the tables, these are large economic impacts by any measure, but especially for a relatively rural region such as eastern Idaho.

Over the four-year period for manufacture and construction, a total of 13,422 job years will be created in the region. This consists of 8,000 direct job years and 5,422 additional job years from the indirect and induced effects of the Project. Labor income in the region will increase by nearly $650 million, gross domestic product in the region by over $1.13 billion and total output in the region will increase by over $2 billion. These results are shown in Table 5 below.

Table Five: Cumulative Economic Impacts for Construction for All Four Years

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	8,000	$445,595,0958	$804,729,176	$1,408,324,423
Indirect Effect	2,086	$89,742,130	$139,881,476	$285,697,466
Induced Effect	3,337	$108,844,596	$189,203,116	$371,600,867
Total Effect	13,422	$644,181,821	$1,133,813,767	$2,065,622,755

The results presented above are the cumulative impacts over the four-year construction period.

Summary of Fiscal Impacts from Construction Activities

Tables 6 and 7 below show the estimated fiscal impacts from the construction of the facility.

The annual increases in tax revenue stemming from the construction activities at the site are shown in Table 6. It is important to note that these occur every year during the construction of the power plant.

Table Six: Annual Fiscal Impacts for Construction

Taxes	Property	Sales/Excise	Income/Corporate	Total
State and Local	$3,822,305	$6,113,577	$5,641,071	$15,576,952
Federal		$1,355,190	$34,706,554	$36,061,743

As shown by the above tables, there will be significant in increases in tax revenues at the local, state, and federal levels in addition to the increased employment, income and economic activity generated by the construction of the facility. On an annual basis, these activities will add nearly $4 million in local property taxes annually over the construction period. Added revenues from sales, excise, individual, and corporate income taxes, will further increases tax revenues in the state. Tax revenues in Idaho will increase by over $15.5 million annually during the construction period, with increases in federal tax revenues of just over $36 million annually

Table Seven: Total Fiscal Impacts for Construction for All Four Years

Taxes	Property	Sales/Excise	Income/Corporate	Total
State and Local	$15,289,218	$24,454,306	$22,564,283	$62,307,807
Federal	-	$5,420,758	$138,826,215	$144,246,973

The total fiscal impacts over the entire construction period exceed $62 million in additional state and local tax revenues and over $144 million in additional federal tax revenues, as shown above in Table 7.

Summary of Economic Impacts from Operations

The economic and fiscal impacts detailed above are limited to the period of construction of the SMR power plant. While large and significant, it is the ongoing impacts from the continued operations of the SMR power plant that will yield long-term impacts for the regional economy and will, much as does the INL itself, add greatly to the level and stability of the eastern Idaho economy. Table 8 below summarizes the economic impacts from the facility's operations.

Table Eight: Annual Economic Impacts from Operations

Impact Type	Employment	Labor Income	Value Added	Output
Direct Effect	360	$37,523,037	$56,227,522	$45,850,967
Indirect Effect	61	$2,287,739	$3,436,648	$7,770,266
Induced Effect	246	$8,077,649	$14,007,981	$27,531,042
Total Effect	667	$47,888,424	$73,672,151	$81,152,275

As seen in the above table, the facility itself will provide 360 permanent, full time jobs. With the added indirect and induced effects, the increase in employment will total 667 jobs. This increased employment will add nearly $50 million to labor income in the region. The addition to the region's gross domestic product totals nearly $75 million annually and the increase in total economic activity totals just over $80 million annually. It should be noted that these ae all annual additions to the regional economy and will occur every year for the 40 year or likely 60 year, life of the facility.

Summary of Fiscal Impacts from Operations

The annual increases to tax revenues for the regional, state, and federal governments are summarized in Table 9 below.

Table Nine: Annual Fiscal Impacts for Operations

Taxes	Property	Sales/Excise	Income/Corporate	Total
State/Local	$1,647,661	$2,635,348	$1,528,182	$5,811,191
Federal	-	$584,175	$10,664,371	$11,248,546

As can be seen by comparing Tables 7 and 9, the annual increases in local and state tax revenues are higher during the construction phase of the SMR power plant at the INL site. However, the continued operation of the facility over several decades provides ongoing annual contributions to local governments in the region as well as to state tax revenues. For example, the operations of the facility will contribute over $1.6 million annually in property tax revenue and, as such, will contribute needed revenues to local governmental coffers including school district funding.

Section 5: Summary

Summary of Economic and Fiscal Impacts from Construction and Operations

The purpose of this report is to quantify many of the benefits expected to be forthcoming to the eastern Idaho region by the development of the SMR power plant at the INL site near Idaho Falls. By doing so, this report clearly demonstrates the facility's role in significantly increasing employment, incomes, and economic activity in the region. These key findings of this study are summarized below.

Construction and manufacture activities from the project will provide significant increases in eastern Idaho employment and labor income.

On a yearly basis, employment in the region will increase by 2,000 jobs annually for four years. With the additional indirect and induced effects of these activities, the total effect on employment in the region will amount to 3,356 jobs annually. This increased employment will add an estimated $161 million in labor income in eastern Idaho on a yearly basis during the construction of the Project.

The manufacture and construction of the power plant will increase direct employment by 8,000 job years and total employment in the region by 13,422 job years over the entire four-year construction period of the facility. This increased employment will add nearly $650 million in labor income in eastern Idaho.

Construction and manufacture activities from the Project will generate large increases in economic output in the region.

With direct increases of $1.41 billion and added indirect and induced effects of $285.70 million and $371.60 respectively, total output in the region is estimated to increase by over $2 billion over the four-year construction period. On an annual basis, these amount to increases of over $516 million for each year of the construction period.

Tax revenues in the region and the state will increase significantly due to the construction and manufacture of the Project.

State and local tax revenues will increase by over $62 million over the construction period with tax revenues for the federal government increasing by an estimated $144.25 million. On an annual basis over the construction period, state and local tax revenues will increase by over $15.5 million annually and federal tax revenues will increase by just over $36 million annually.

Annual operations of the Project will provide ongoing additions of 667 jobs annually to the eastern Idaho region and nearly $50 million in labor income.

With direct employment of 360 jobs and the additional indirect and induced effects from the annual expenditures on operations and maintenance activities, total employment in the region will increase by 667 jobs annually. Because of this increased employment, labor income in the region will increase by $47.9 million for each year of life of the Project.

The Project's ongoing operations and maintenance activities will result in significant increases overall economic output in the region and provide increased tax revenues.

The economic activity resulting from the operation of the facility will increase the region's total output by over $80 million annually over the life of the Project. As a result, local and state tax revenues will increase by nearly $6 million, with increases in federal tax revenues of just over $11 million annually.

In addition to the increased employment, labor income, economic output, and tax revenues stemming from the construction and operation of the Project, the facility will provide an ongoing stabilizing force to the eastern Idaho economy as the economic and fiscal impacts arising from the facility will be continuous and stable due to the nature of the baseload power production from the plant. These benefits will help mitigate the effects of cyclical declines and growth in other sectors of the state's economy. Further, while many benefits of the facility are demonstrated in this report, it is important to realize that there are likely many additional benefits that are difficult to quantify. Given the nature of the personnel hired for plant operations, for example, these include the effects from adding to the highly skilled workforce already at the INL site. In short, the added economic benefits to the region, the added tax revenues, and other benefits stemming from the sustained presence of the facility is anticipated to be a significant contributor to the quality of life in the communities surrounding the facility and to the state.

Caveats and Limitations of the Study

There are several important caveats and limitations to this study. First, given that SMR construction and manufacturing is still in the planning and development process, the specific supply chains are currently being determined and established; and have not been publicly released. Therefore, in conducting this analysis, this study relied heavily on the existing construction production characteristics and supply chain identified by the IMPLAN database. The results are highly sensitive to potential changes in the supply chain. Secondly, we explicitly assumed that $1.408 billion of direct economic activity (i.e. expenditures) from the construction of Project will occur in the southeast Idaho regional economy. To the extent that some of these expenditures may occur outside the region, the economic impacts will be proportionally reduced. We also assumed that all the labor will be provided by southeast Idaho residents. To the extent that labor is imported from outside the region, the impacts will be proportionally reduced. The magnitude of these economic impacts is highly sensitive to the degree to which they occur within the regional economy or alternatively leak out of the economy. Third, this study made some adjustments to the IMPLAN parameters in conducting the analysis. For example, the average compensation package per (direct) construction worker was adjusted to be about $56,000, including fringe benefits, given a construction project of

this size and magnitude. For the ongoing power plant operations, an average total compensation package of about $104,000 was assumed in the analysis. The economic impacts of the power plant operations were limited to the operation of the plant itself and did include the expenditures associated with the distribution of the electricity from the plant.

The jobs multiplier for construction was 1.68. For every direct construction job, a total of 1.68 jobs are created in the economy or an additional 0.68 jobs was added to the economy from the indirect and induced impacts. The operations jobs multiplier was 1.85. The output/sales construction multiplier was 1.467. For plant operations, the output/sales multiplier was 1.77.

We assumed the annual construction impacts were linear over the four-year construction period. The IMPLAN model year was 2015 and all dollar results are expressed in constant 2015 dollars.

We employed an EMSI (Economic Modeling Specialist, International) input-output model to validate and compare with the IMPLAN results.

Appendix

Resume of Economic Researchers

Dr. Geoffrey Black, PhD

Dr. Geoffrey Black is a professor in the Department of Economics at Boise State University and a research associate at the Idaho National Laboratory's Center for Advanced Energy Studies. He obtained his PhD from the University of Washington with fields in Natural Resource Economics, Public Finance and Public Policy Economics. He performs research on economic development, public policy and energy strategy. Dr. Black also performs analyses on the economic impacts of public and private research and development activities, deployment strategies for new energy technologies and the fiscal implications of state and national economic policy proposals. Recent projects include the fiscal and economic effects of both renewable and nuclear energy projects, the role of federal research facilities in regional economic development, economic impacts of urban and rural development projects and others. Dr. Black works with both domestic and international entities on these issues, has published numerous academic papers and both public and private reports, and given numerous presentations to industry and legislative groups, academic and industry conferences, research institutions and development agencies across the United States and internationally.

Mr. Steven Peterson

Steven Peterson is a Clinical Assistant Professor in Economics at the University of Idaho, where he has been employed for 25 years. His research specialty is local and regional economic analyses, specializing in economic impact assessments. Mr. Peterson has conducted over 100 economic impact assessments, touching on nearly every industry in the region and the state.

General and Limiting Conditions

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