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# Economic and Fiscal Impacts of Proposed LNG Facility in Robbinston, Maine

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**ECONOMIC AND FISCAL IMPACTS OF A  
PROPOSED LNG FACILITY IN  
ROBBINSON, MAINE**

Prepared for: Downeast LNG

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## EXECUTIVE SUMMARY

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In July of 2005, Downeast LNG announced a proposal to build and operate a \$400 million liquefied natural gas (LNG) import terminal in Robbinston, Maine. The facility would include a pier, up to two LNG storage tanks, equipment used to convert LNG from a liquid to a gas, and a pipeline used to transport the gas to the Maritimes and Northeast Pipeline. The facility would take three years to build and, once operational, it would annually process about 180 billion cubic feet of natural gas that would be transported across Maine and New England.

The purpose of this study is to examine the economic and fiscal impacts of the proposed Downeast LNG facility on the Town of Robbinston, Washington County, and the State of Maine. The economic impact analysis focuses on the employment and income that are associated with the LNG facility construction and operations. The fiscal impact analysis considers additional local and state tax revenues associated with the facility, as well as increased local government expenditures that are projected to result from the LNG project. This report does not address the environmental, homeland security, or energy security impacts of the LNG facility. In addition, this report does not estimate any changes in the price of delivered natural gas in Maine that could potentially result from a new major energy supplier.

### **Summary of Economic Impacts**

Downeast LNG's pre-operations activities would consist of a three-year facility construction period and the purchase of tugboats, which we assume in this study will be manufactured in Maine. These activities would support an estimated 1,053 jobs throughout the state in each of three years. Maine workers associated with Downeast LNG's pre-operations activities would receive an estimated \$42.9 million in income per year. Construction of the LNG facility would support an estimated 375 jobs in Washington County, counted in the statewide impact of 1,053 jobs, in each year of the construction project. These workers located in Washington County would receive an estimated \$15.3 million in income per year.

Once the facility is built, its operations would support an estimated 253 jobs in Maine over the lifecycle of the LNG terminal, expected to be 30 years or longer. These workers located across the state would receive an estimated \$10.7 million in income per year. LNG facility operations would support an estimated 187 jobs in Washington County, counted in the statewide impact of 253 jobs, per year over the terminal's lifecycle. These workers located in Washington County would receive an estimated \$8.1 million in income per year.

### **Summary of Fiscal Impacts**

Maine workers associated with facility construction and tugboat manufacturing would pay an estimated \$1.4 million in state personal income taxes in each of the three years of pre-operations activities. Economic activity associated with facility construction and tugboat manufacturing would also generate an estimated \$1.3 million in state sales taxes in each year of the construction project.

Once the facility is in operation, Downeast LNG would pay between \$625,000 and \$1.8 million in corporate income taxes annually. Maine workers who are directly and indirectly supported by the facility would pay an estimated \$539,268 in state personal income taxes annually over the lifecycle of the terminal. Economic activity associated with facility operations would also generate an estimated \$246,282 in state sales taxes per year.

The presence of a \$400 million LNG facility in Robbinston would lower the town's full value tax rate by 69.1%. Downeast LNG would pay \$1.2 million in local property taxes on an annual basis over the lifecycle of the terminal. This would amount to 92.1% of the total property taxes paid in Robbinston (assuming no new property construction).

## TABLE OF CONTENTS

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<b>1. Background and Introduction .....</b>	<b>1</b>
<b>2. Economic and Housing Market Profile of Robbinston.....</b>	<b>2</b>
<b>3. Overview of the LNG Industry and Related Impacts .....</b>	<b>6</b>
Brief History and Current Status of the LNG Industry .....	6
Impacts of Existing and Other Proposed LNG Facilities.....	7
Other LNG Study Findings Relative to Downeast LNG .....	10
<b>4. Economic Impacts of the Proposed Downeast LNG Facility .....</b>	<b>11</b>
Economic Impact Analysis Summary .....	11
State-Level Impacts of Facility Construction .....	12
County-Level Impacts of Facility Construction.....	15
State-Level Impacts of Tugboat Manufacturing .....	17
County- and State-Level Impacts of Facility Operations .....	18
<b>5. Fiscal Impacts of the Proposed Downeast LNG Facility .....</b>	<b>21</b>
Fiscal Impact Analysis Summary.....	21
Town-Level Fiscal Impacts .....	21
State-Level Fiscal Impacts .....	23
<b>6. Summary .....</b>	<b>25</b>
Study Limitations.....	27
<b>References .....</b>	<b>28</b>

---

**LIST OF TABLES**

---

Table 1:	Economic and Demographic Data for the Town of Robbinston.....	2
Table 2:	Housing Market Data for the Town of Robbinston .....	3
Table 3:	Assessed Valuations of Developed Land Parcels Located Within One-Half Mile of Mill Cove.....	5
Table 4:	Expenditures to Construct a \$400 Million LNG Terminal.....	12
Table 5:	Data Used to Estimate State-Level Construction Expenditures .....	13
Table 6:	Estimated Annual State-Level Direct Impacts of LNG Facility Construction.....	14
Table 7:	Estimated Annual State-Level Impacts of LNG Facility Construction .....	15
Table 8:	Data Used to Estimate County-Level Construction Expenditures.....	16
Table 9:	Estimated Annual County-Level Direct Impacts of LNG Facility Construction.....	16
Table 10:	Estimated Annual County-Level Impacts of LNG Facility Construction .....	17
Table 11:	Estimated Annual State-Level Impacts of Tugboat Construction .....	17
Table 12:	Downeast LNG Annual Spending Projections .....	19
Table 13:	Estimated Annual County-Level Impacts of LNG Facility Operations .....	19
Table 14:	Estimated Annual State-Level Impacts of Facility Operations.....	20
Table 15:	Estimated Annual Economic and Fiscal Impacts Associated with Downeast LNG’s Pre-Operations Activities (Duration: 3 years).....	25
Table 16:	Estimated Annual Economic and Fiscal Impacts Associated with Downeast LNG’s Operation (Duration: 30 years or longer).....	26

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**LIST OF FIGURES**

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Figure 1:	Mill Cove Area of Robbinston.....	4
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## 1. BACKGROUND AND INTRODUCTION

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In July of 2005, Downeast LNG announced a proposal to build and operate a liquefied natural gas (LNG) terminal in Robbinston, Maine. The project would involve the construction of a \$400 million facility on an 80-acre parcel of land (30 acres of which would be developed), located at a waterfront site known as Mill Cove. The facility would include a pier, up to two LNG storage tanks, re-gasification equipment used to convert LNG from a liquid to a gas, and a pipeline used to transport the gas to the Maritimes and Northeast Pipeline. Once operational, the facility would annually process about 180 billion cubic feet of natural gas that would be transported across Maine and New England. Downeast LNG estimates that its project would require the use of approximately 300 individuals on-site over the three-year construction period, and approximately 78 workers, including tugboat operators and positions within the terminal, during operations. These employment numbers are based on preliminary engineering and planning ([www.downeastlng.com](http://www.downeastlng.com)).

The purpose of this study is to examine the economic and fiscal impacts of the proposed Downeast LNG facility on the Town of Robbinston, Washington County, and the State of Maine. Our analysis is based on information from several publicly available sources including state and federal government statistics, other university and LNG industry studies, and information and reports posted on the Downeast LNG website ([www.downeastlng.com](http://www.downeastlng.com)).

The economic impact analysis focuses on the employment (i.e., number of jobs) and income (i.e., wages, salaries and benefits) that are directly and indirectly associated with the LNG facility construction and operations. Importantly for Maine policy-making purposes, the fiscal impact analysis considers additional local and state tax revenues associated with the facility, as well as increased local government expenditures that are projected to result from the LNG project. This report does not address the environmental, homeland security, or energy security impacts of the LNG facility. In addition, this report does not estimate any changes in the price of delivered natural gas in Maine that could potentially result from a new major energy supplier.

The rest of the report is organized as follows. Section two provides an economic and housing market profile of Robbinston (the proposed Host Community for the project) and the area around Mill Cove (the proposed project site). Section three presents a general discussion of economic and fiscal aspects of the national LNG industry and its related infrastructure. Section four examines the economic impacts of the Downeast LNG project (e.g., construction and operations) on state and county employment and income. Section five discusses the fiscal impacts of the LNG project on local and state government revenues and expenditures. Section six provides a summary of key findings and discusses study limitations.

## 2. ECONOMIC AND HOUSING MARKET PROFILE OF ROBBINSTON

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As of the 2000 U.S. Census, Robbinston had a total population of 525 people. Census statistics shown in Table 1 indicate that, relative to the entire state of Maine, Robbinston has a lower proportion of residents with at least a bachelor's degree and a higher proportion of residents who are aged 65 and over. The median household income in Robbinston is \$33,250, which is 10.7 percent lower than the statewide median household income of \$37,240.

**Table 1**  
**Economic and Demographic Data for the Town of Robbinston**

<b>Variable</b>	<b>Robbinston</b>	<b>Washington County</b>	<b>State of Maine</b>
Population	525	33,941	1,274,923
Percent of population, 25 years and over, without a high school diploma	22%	20%	15%
Percent of population, 25 years and over, with a bachelor's, graduate, or professional degree	16%	15%	23%
Percent of population under the age of 20	27%	26%	26%
Percent of population aged 65 and over	19%	17%	14%
Median household income	\$33,250	\$25,869	\$37,240

Source: U.S. Census Bureau, *Census 2000*.

Table 2 shows Robbinston housing data from the 2000 U.S. Census. In 2000, there were 341 housing units located in Robbinston. Of these dwellings, 82 are housing for seasonal, recreational, or occasional use. The proportion of housing units that are for these uses is higher in Robbinston (23.8 percent) than in the state as a whole (15.6 percent). About one-third of the housing structures in Robbinston were built before 1940, and 28 percent of the homes were constructed between 1980 and 2000.

**Table 2**  
**Housing Market Data for the Town of Robbinston**

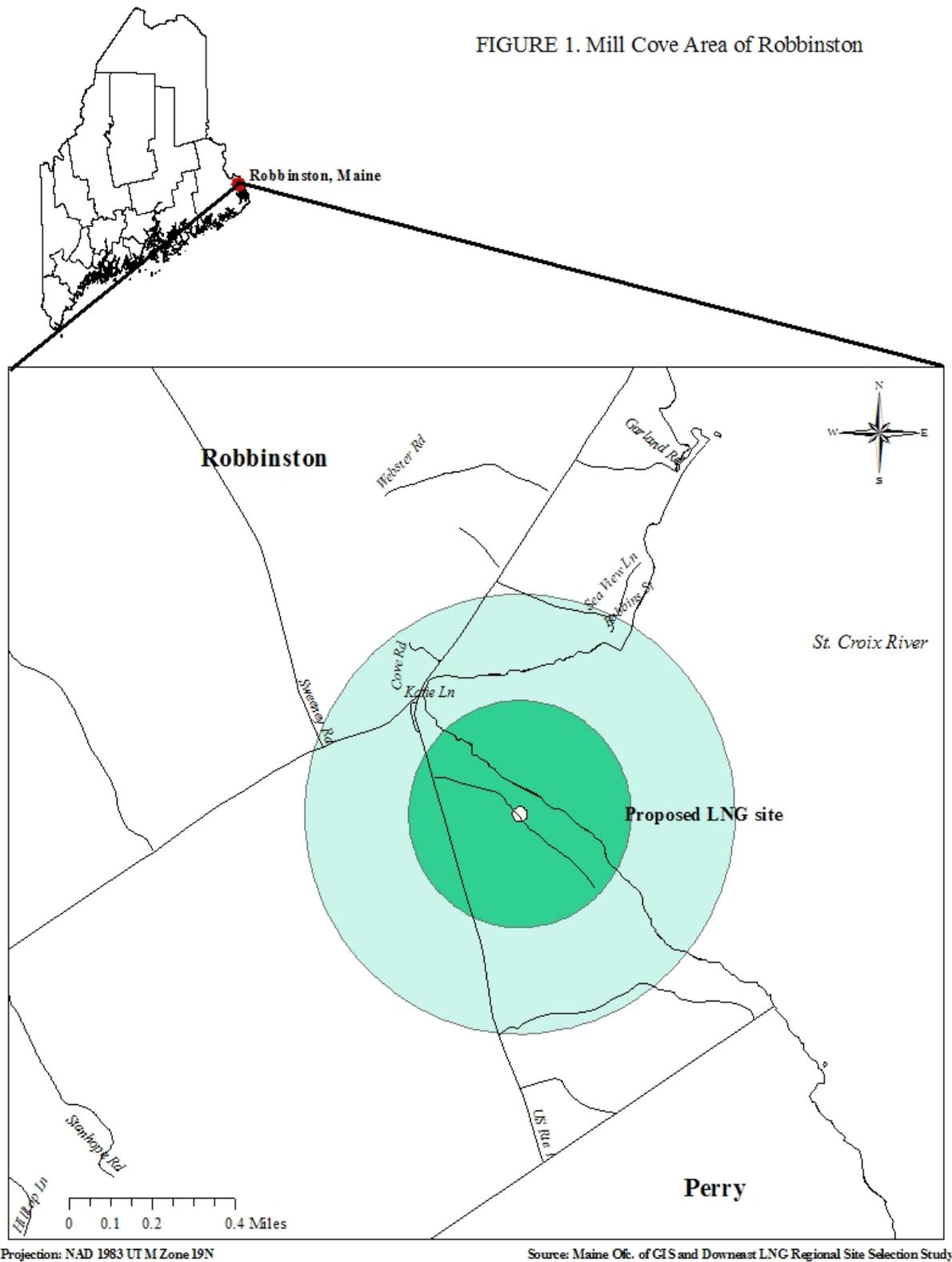
Variable	Robbinston	Washington County	State of Maine
Housing units, 2000	341	21,919	651,901
Units for seasonal, recreational, or occasional use	82	5,374	101,470
Units built prior to 1940	108	7,174	189,859
Units built between 1990 and 2000	41	3,145	94,909
Median value of owner-occupied home, 2000	\$56,500	\$68,700	\$98,700
Proportion of owner-occupied homes valued at less than \$50,000	34%	28%	9%
Proportion of owner-occupied homes valued between \$50,000 and \$100,000	41%	54%	43%
Proportion of owner-occupied homes valued at more than \$200,000	7%	2%	11%

Source: U.S. Census Bureau, *Census 2000*.

As of the 2000 Census, the median value of an owner-occupied home in Robbinston was \$56,500. This is considerably lower than the median home value in Washington County (\$68,700) and the state as a whole (\$98,700). Over one-third of the owner-occupied housing units in Robbinston were valued at less than \$50,000, and 41 percent were valued between \$50,000 and \$100,000. Only seven percent of these homes were valued over \$200,000.

The town of Robbinston property tax list, obtained during the fall of 2005, shows a total of 344 developed properties and 284 undeveloped land parcels. The 344 developed properties have a combined assessed value of \$20.83 million, which includes land and built structures. This results in an average assessed property value of \$60,552. Figure 1 is a map of the area around the LNG terminal's proposed site. The shaded part of the map shows the area of town within one-half mile of Mill Cove. The two rings moving away from Mill Cove each cover one-quarter mile of distance from the proposed terminal site.

FIGURE 1. Mill Cove Area of Robbinston



Using several sources of information provided by the town (e.g., tax maps, registry of property owners, assessed valuation lists) and Geographic Information Systems (GIS) technologies, we were able to identify the value of 38 parcels (28 developed and 10 undeveloped) located within one-half mile of Mill Cove. This amounts to 86.4 percent of the 44 parcels shown on the town tax maps to be within the circumscribed region. We were unable to determine the value of the other six parcels because the properties listed on the town tax maps did not appear on the town's registry of property owners. Table 3 shows the average assessed values of developed parcels that are located at distances within one-quarter mile, and one-quarter to one-half mile of the proposed terminal. The 28 developed properties located within one-half mile of the proposed LNG facility have an average assessed value of \$55,727, which is lower than the town-wide average of \$60,552.

**Table 3**  
**Assessed Valuations of Developed Land Parcels Located**  
**Within One-half Mile of Mill Cove**

<b>Distance</b>	<b>Number of Parcels Identified in Our Analysis</b>	<b>Average Assessed Valuation</b>
Within ¼ Mile	4	\$45,111
¼ to ½ Mile	24	\$57,497
Within ½ Mile	28	\$55,727

Source: Town of Robbinston Property Tax Data.

### **3. OVERVIEW OF THE LNG INDUSTRY AND RELATED IMPACTS**

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The LNG industry is built around a technology that cools natural gas to a point, around minus 260 degrees Fahrenheit, where it becomes a liquid. In a liquid state, LNG has a volume (i.e., space requirement) that is 1/600<sup>th</sup> of its gaseous form. Whereas the market area for natural gas historically has been limited by the availability and location of reserves and a supporting pipeline network, LNG technologies facilitate the long-distance transport of natural gas by large shipping vessels (Jensen 2004). Once it is warmed back into a gas and connected to a pipeline at an import terminal, LNG can expand the supply of natural gas in areas with low domestic reserves and/or high demand.

LNG requires large infrastructure investments both in areas where natural gas is extracted and liquefied, as well as in places where it is transported and converted back into a gas. According to one estimate, a re-gasification terminal similar to the proposed Downeast LNG facility in Robbinston costs about \$500 million to build (Jensen 2004). Another study estimates that a re-gasification facility costs between \$400 million and \$600 million to construct (Smith et al. 2004). As noted above, Downeast LNG proposes to build a \$400 million re-gasification facility in Robbinston. This estimate falls within the range of cost estimates reported elsewhere.

#### **Brief History and Current Status of the LNG Industry**

The history of LNG began in the United States in 1958, when a non-commercial shipment was made from Lake Charles, Louisiana to Canvey Island, United Kingdom (Jensen 2004). Commercial shipments began in 1964 from Algeria to the United Kingdom and France. In 1972, the United States began receiving commercial LNG shipments at a facility in Everett, Massachusetts. Three additional U.S. LNG import terminals began commercial operations between 1978 and 1982 at Cove Point, Maryland; Elba Island, Georgia; and Lake Charles, Louisiana. A fifth LNG import terminal was completed in Puerto Rico in 2000 and the United States has one LNG export facility located in Kenai, Alaska, which was built in the 1970s.

Despite the presence of five commercial LNG terminals, the United States historically has been – and currently still is - a relatively small importer of LNG compared to other nations (Jensen 2004). As of 2002, the largest importers (i.e., consumers) of LNG were Japan (72.74 billion cubic meters, abbreviated as BCM), Korea (24.06 BCM), Spain (12.26 BCM), France (11.54 BCM), United States (7.11 BCM), Taiwan (7.00 BCM), Italy (5.70 BCM) and Turkey (5.35 BCM). Major exporters (i.e., producers) of LNG in 2002 include Indonesia (34.22 BCM), Algeria (26.88 BCM), Malaysia (20.52 BCM), Qatar (18.59 BCM) and Australia (10.03 BCM). According to the Energy Information Administration, United States Department of Energy, Trinidad and Tobago was the largest supplier of LNG to the United States in 2002.

U.S. imports of LNG are expected to grow substantially over the coming decades. The four continental U.S. LNG terminals listed above imported 0.5 trillion cubic feet of natural gas in 2003 (Smith et al. 2004). This represented about two percent of the natural gas consumed in the United States that year. By 2025, total net LNG imports to the United States are expected to reach 6.4 trillion cubic feet (Energy Information Administration 2005). This

would amount to over 20 percent of the natural gas that the Energy Information Administration forecasts will be consumed by the United States in 2025. The increase in LNG will be provided through the expansion of existing facilities and the construction of new LNG facilities in North America. According to the United States Federal Energy Regulatory Commission (FERC), 58 North American facilities (including the proposed Downeast LNG project) were in various stages of planning as of July 21, 2005.

Several factors are contributing to the increased projected consumption of LNG and demand for new facilities. The U.S. Congressional Research Service's report to Congress finds that natural gas, not coal, is the current fuel of choice for new electricity generation ([www.ncseonline.org/nle/crsreports/air/air-22.cfm](http://www.ncseonline.org/nle/crsreports/air/air-22.cfm)). Some reasons behind this are that natural gas fueled power plants, similar to the Maine Independence Station located in Veazie, are about 40 percent more efficient than traditional oil-fired steam boilers. Furthermore, natural gas is "essentially free of sulfur and particulate matter" (Jensen 2004, p. 12), and it has a high hydrogen-to-carbon ratio that minimizes CO<sub>2</sub> emissions. According to the Energy Information Administration, increased domestic supplies from Alaska and imports of LNG (see above) will help meet the growing U.S. demand for natural gas. The economics of LNG transport have improved in recent years because of reductions in the costs of liquefaction facilities and shipping vessels, made possible through increased industry competition and productivity gains (Jensen 2004).

### **Impacts of Existing and Other Proposed LNG Facilities**

As with any business activity, the expansion of existing LNG facilities and the construction and operation of new terminals will have an impact on local employment, income and tax revenues. Many LNG developers, with projects that are currently in the planning stages, have released estimates of local economic and fiscal impacts. Likewise, studies conducted by university researchers and private consultants have examined the impacts, both positive and negative, of LNG facilities on their surrounding communities.

We looked at numerous LNG project websites to gain a sense of the proposed economic and fiscal impacts of LNG facilities reported by developers in other areas. The impacts from the Freeport LNG, Canaport LNG, and Weaver's Cove projects are representative of what we found. However, it is important to note that no two LNG import facilities are identical. They differ with respect to facility size, local employment base, natural environmental setting, exclusion zones, and local tax rates and obligations. These differences may contribute to a wide range of facility impacts on their surrounding communities. In addition, differences may exist across projects in the ways employment and other impact measures are reported.

The Freeport LNG project involves the construction of an import terminal on Quintana Island, Texas. According to the project's website ([www.freeportlng.com](http://www.freeportlng.com)), an average of 500 workers would be employed during the facility's construction and, once operational, the facility would directly employ 40 people. This total does not include security and tug personnel. Developers of the Canaport LNG project, located in Saint John, New Brunswick, predict that 700 workers would be employed at the peak of the facility's construction ([www.irvingoilco.com/LNG](http://www.irvingoilco.com/LNG)). Once operational, the Canaport LNG import terminal would employ 40 workers and generate \$18 million (Canadian) in taxes and fees.

The Weaver's Cove project in Fall River, Massachusetts, would support 350 jobs during the construction stages and, once operational, would directly employ 30 to 35 workers ([www.weaverscove.com](http://www.weaverscove.com)). Project developers predict that the Weaver's Cove facility would pay \$3 million in real estate taxes, and would purchase \$4 million in local goods and services and an additional \$3 million in marine services to support its operations.

University researchers at the Tulane-Entergy Energy Institute analyzed the aggregate impacts of nine proposed LNG projects in Louisiana (Moroney et al. 2004). These projects include the expansion of the existing terminal located at Lake Charles, and the construction of new onshore and offshore facilities. Capital expenditures to expand and construct these facilities are expected to total \$3.73 billion, of which an estimated \$2.32 billion would be spent within Louisiana. Applying an output multiplier of 2.11, Moroney et al. (2004) estimate that the construction activity associated with the LNG facilities would lead to a \$4.89 billion increase in gross state product.

The construction phase of the nine proposed LNG projects in Louisiana also would directly support an estimated 9,755 person-years of employment over six years. Applying an employment multiplier of 2.45, Moroney et al. (2004) estimate that the construction activity associated with the LNG facilities would directly and indirectly support 23,880 person-years of employment over six years. Once the LNG terminals are operational, they estimate that the facilities would employ and indirectly support a total of 536 permanent workers.

Researchers at Towson University examined the impacts of an expansion of the existing LNG facility located at Cove Point, Maryland (RESI 2004a). A doubling of that terminal's capacity, including a proposed pipeline extension through three Maryland Counties, would require construction expenditures of about \$560 million. RESI (2004a) estimates that the four-year construction phase of the LNG project would contribute \$45 million in total output to a four-county region of southern Maryland, and provide \$20.4 million in wages to support 244 (temporary) jobs that are held by residents from the area. The construction project would also employ a large number of workers who are from outside the four-county region. Once the expansion is complete, RESI (2004a) estimates an ongoing annual impact of \$42.8 million in additional output within the southern Maryland economy, \$5.1 million in annual earnings, and an employment impact of 148 jobs. These figures include direct and indirect (i.e., multiplier) effects.

The Aquidneck Island Planning Commission released a study, conducted by Pare Engineering Corporation (2005), on the potential impacts of tanker traffic on recreational and commercial boating in and around shipping channels used to transport LNG to Weaver's Cove Energy in Fall River, Massachusetts. Some of the costs associated with LNG tanker transit through waters off the coast of Rhode Island may be increased boat fuel expenditures during delays; lost time and revenues if commercial fishing activity, charters, tour boats or cruise ships are impacted; loss of access to waters for recreational and commercial uses; and the opportunity costs of development that may not occur in the future. The study discusses the overall economic activity generated by tourism, recreational boating, coastal residential development, regattas and sailing events, cruise ships, commercial fishing, and other marine-related activities in the Rhode Island areas of Newport, Middletown and Portsmouth. However, in most cases, the author(s) do not provide a precise estimate of the extent to which the activity would be impacted by the LNG tankers.

(Input-output models, the standard methodology used to estimate the impact of an LNG facility on local employment and income, do not typically account for economic activity that is displaced in other sectors by the addition of an LNG facility.)

Shortly after the release of the Aquidneck Island Planning Commission study, the LNG project developer (Weaver's Cove Energy) questioned the validity of the analysis (Smith 2005). One of the issues under dispute is the size of the LNG vessel security zones, which would determine the extent to which boating may be disrupted in Newport Harbor. In response to the study's implication of reduced cruise ships and pleasure boating, the LNG developer pointed out that these activities have increased in Boston Harbor where LNG tankers pass en route to the terminal in Everett, Massachusetts. Opponents of the proposed Weaver's Cove LNG facility suggest that, due to differences in the distances the vessels must travel to access the terminals, the comparisons between the existing facility in Everett and the proposed facility in Fall River are not valid.

In Maine, Yellow Wood Associates (2004) conducted a study that discussed some of the negative fiscal impacts of a proposed LNG terminal. The study suggested that, if a planned tax incentive arrangement between the town and developer was disallowed, a \$350 million (i.e., expected construction cost of the proposed LNG facility in Harpswell) increase to the local tax base would lead to an increase in Harpswell's tax obligations to Cumberland County, an increase in the town's share of costs paid to a multi-town school district, a decrease in state education subsidies, and a decrease in state revenue sharing. In addition, the Yellow Wood Associates (2004) study discussed some additional costs (e.g., town administration, emergency response, etc.) the town might incur as a result of the LNG project. Finally, the study also considered the impacts of the proposed facility on surrounding property values, as well as negative impacts to commercial fishing and local recreation and tourism. Key concerns to local marine-based industries were increased congestion from periodic tanker traffic, possible loss of access to fishing grounds, and damage to fishing gear.

An academic journal article written by Clark and Nieves (1994) examined the effects of eight types of large industrial facilities, including LNG storage sites and terminal installations, on local housing values and wages. The interregional hedonic analysis approach used in the study is based on the idea that, when viewed as a disamenity, facilities such as hazardous waste sites and power plants lead to lower housing values and higher wages because people have to be compensated to live and work in regions where they are located. (However, the interregional approach used by Clark and Nieves (1994) does not allow them to say anything, one way or the other, about the impacts of LNG facilities on the value of surrounding properties.) Empirical results presented by Clark and Nieves (1994) found that, other things being equal, the presence of an LNG facility results in higher housing values and wages in regions where they are located. These findings provide mixed evidence related to how residents view LNG facilities. The result that LNG facilities lead to higher housing prices is consistent with people considering them to be local amenities.

A review of the hedonic analysis literature by researchers at Towson University found that the effects of "local unwanted land uses" (LULUs) on surrounding property values vary widely. RESI (2004b) examined published journal articles that considered several types of perceived local disamenities such as landfills, Superfund sites, nuclear power plants, and large

manufacturing facilities. The studies reviewed by RESI (2004b) provide mixed results related to how these land uses and facilities impact surrounding property values.

### **Other LNG Study Findings Relative to Downeast LNG**

These studies of other existing and proposed facilities, some of which are no longer under consideration, provide insights into the concerns that local residents have about the ways in which an LNG import terminal might affect its surrounding community. Although similar economic and fiscal impacts may apply, the specific impacts estimated in other studies are not transferable to the Downeast LNG project. Each project encounters unique local economic, fiscal and environmental conditions, and establishes its own mitigation arrangements between the developer and surrounding area. Several of the ways in which the Downeast LNG project differs from other projects are discussed below.

First, the types of industries present in Maine differ from those available in regions with an established oil and gas industry. Development of an LNG terminal in a state such as Louisiana, examined in the Tulane-Energy Institute study, may support in-state employment in sectors that manufacture LNG equipment and machinery. Employment data from the U.S. Department of Labor indicate that, as of 2003, Louisiana had 6,117 employees in the industrial sector of “mining and oil and gas field machinery manufacturing.” By comparison, information from the U.S. Department of Labor shows that Maine had zero employment in the “mining and oil and gas field machinery manufacturing” industry as of 2003.

Second, the town of Robbinston and surrounding Washington County has substantially less tourism than the Harpswell region and areas of Rhode Island examined in other LNG studies. Colt et al. (2000) estimated that outdoor recreation activities have a total annual value of \$2.0 billion in the Narragansett Bay area of Rhode Island. Taxable retail sales data from Maine Revenue Services show that the Calais Economic Summary Area (ESA), which includes Robbinston, had \$9.57 million in restaurant and lodging sales in 2004. This accounts for 9.25 percent of total retail sales in the Calais ESA. By comparison, the Brunswick ESA, which includes the town of Harpswell, had \$91.77 million in restaurant and lodging sales in 2004. The restaurant and lodging sector made up 15.21 percent of total retail sales in the Brunswick ESA.

Third, the area surrounding the proposed LNG facility in Robbinston is substantially less developed than the area around the proposed facility in Harpswell, which is no longer under consideration. The Yellow Wood Associates study counted 149 properties within one-half mile of the proposed terminal site that had a total value, calculated from local property tax records, of \$18.28 million (average of \$122,679 per property). By comparison, our analysis found 28 developed parcels within one-half mile of the proposed LNG facility site in Robbinston. These properties, not including undeveloped land, have a total assessed value of \$1.56 million (average of \$55,727 per property).

#### **4. ECONOMIC IMPACTS OF THE PROPOSED DOWNEAST LNG FACILITY**

In this section, we examine the economic impacts of the proposed LNG terminal. First, we investigate the impacts of facility construction that, according to Downeast LNG, would take place over a three-year period. Second, we analyze the temporary impacts of the manufacturing of tugboats, which Downeast LNG plans to purchase from a Maine boat builder. Third, we look at the ongoing impacts of facility operations. In each case, our analysis considers the employment and income impacts occurring at the state and county levels. Throughout the report, the statewide economic impact estimates include activity occurring in Washington County.

The economic impact analysis is based on construction expenditure figures from the Tulane-Entergy Energy Institute, industry employment and wage figures from the U.S. Department of Labor, and information from Downeast LNG. We acknowledge upfront that our analysis of the construction impacts is subject to limitations inherent in the use of secondary data sources. For example, the industrial classification system used to report federal government statistics does not include a specific category for construction of an LNG facility. To overcome this limitation, we estimate the impact of facility construction spending using information on a combination of industrial sectors (e.g., site preparation contractors, industrial building construction, etc.) for which data are available from U.S. government sources.

Another data limitation is that historical state- and county-level employment figures do not capture people who potentially may be attracted to the region to work on a large construction project. It is possible that current Maine workers could change jobs, or Maine construction workers currently employed out of state may return to the area to work on the LNG facility. Finally, as noted above, a limitation inherent in the use of an input-output model is that it does not account for any economic activity that may be displaced in other sectors by the addition of an LNG facility. Thus, the actual employment and income impacts could differ from those presented below.

##### **Economic Impact Analysis Summary**

To summarize the results from the economic impact analysis, we find that construction of a \$400 million LNG facility would support a total (i.e., including multiplier effects) of 966 jobs across Maine in each of the three years of the construction project. These workers would receive an estimated \$39.7 million in income per year. Focusing on local impacts that are counted in the statewide impact figures, we find that construction of the LNG facility would support a total of 375 jobs in Washington County in each of the three years of the construction project. These workers would receive an estimated \$15.3 million in income per year.

Prior to beginning its operations, Downeast LNG also plans to purchase tugboats that are built by a Maine company, located outside of Washington County. Our analysis, described in detail below, shows that \$24 million of expenditures on tugboats would support a total of 87 jobs across Maine in each of the three years the tugboats are being built. These workers would receive an estimated \$3.2 million in income per year. Adding the temporary

construction impacts to the temporary tugboat manufacturing impacts, we estimate that the pre-operations activities of Downeast LNG would support a total of 1,053 jobs across Maine in each of three years. These workers would receive a combined total of \$42.9 million in income per year.

Our analysis shows that, once the facility is in operation, its activities would support an annual total of 253 jobs across Maine over the lifecycle of the LNG import terminal, which is expected to be 30 years or longer. These workers would receive an estimated \$10.7 million in income per year. Focusing on local impacts that are counted in the statewide impact figures, we find LNG facility operations would support a total of 187 jobs in Washington County over the terminal’s lifecycle. These workers would receive an estimated \$8.1 million in income per year.

**State-Level Impacts of Facility Construction**

According to Downeast LNG, the project calls for the construction of a \$400 million facility to be built over three years. Table 4 shows the amount of spending, by major expenditure category, required to construct a typical \$400 million onshore LNG import terminal. These estimates are from the Tulane-Entergy Energy Institute study discussed above. As described by the authors, the expenditure figures are “based on investment plans for the nine [LNG] projects planned for Louisiana... [and] independent estimates of capital costs for both onshore and offshore terminals using Waldemar S. Nelson and Company, a major engineering firm in Louisiana” (Moroney et al. 2004, p. 2).

**Table 4  
Expenditures to Construct a \$400 Million LNG Terminal**

<b>Category</b>	<b>Expenditures</b>	<b>Estimated % In-State*</b>	<b>Estimated In-State Expenditures*</b>
Land Site	\$25 million		
Preparation			
<i>Site Subtotal:</i>	\$25 million	100%	\$25 million
Dock	\$60 million		
Containment	\$100 million		
Site Improvements	\$20 million		
Pipelines	\$50 million		
Engineering / Management	\$45 million		
<i>Facility Subtotal:</i>	\$275 million	72%	\$197.5 million
Unloading / Processing Equipment	\$100 million		
<i>Equipment Subtotal:</i>	\$100 million	NA	NA
<b>Total</b>	<b>\$400 million</b>		<b>\$222.5 million</b>

Sources: Tulane-Entergy Energy Institute (2004) and Authors’ Calculations\*.

The impact of construction spending in Maine would depend, in part, on the availability of businesses and workers needed to build the facility. We use a “location quotient technique,” which is standard in the input-output literature, to estimate the proportion of construction spending that would occur in Maine (Miller 1985). A location quotient measures the proportion of statewide employment in an industry relative to the proportion of total U.S. employment in the same sector. In our analysis, values greater than 1.0 imply that the sector is concentrated in Maine relative to the United States as a whole. As is standard practice, we assume that a location quotient greater than or equal to 1.0 indicates that 100 percent of the spending in the industry will occur in Maine (Miller 1985). On the other hand, a location quotient less than 1.0 suggests that the industry is less concentrated in Maine than in the United States as a whole. In this case, we use the calculated value of the location quotient as an estimate of the proportion of industry spending that is likely to occur in Maine.

In our analysis, we combine the expenditure categories used in the Tulane-Entergy Energy study into three groups labeled as “Site,” “Facility,” and “Equipment.” It should be noted, however, that the facility construction expenditures include spending on engineering and management services, and products (e.g., pipelines) that may be manufactured offsite. Table 5 shows the NAICS industrial sectors that correspond to the categories of construction spending, as well as Maine and U.S. employment levels in these sectors. As described above, the proportion of construction spending that would likely take place in Maine is estimated using a location quotient technique (Miller 1985). The location quotients used in the analysis are also presented in table 5.

**Table 5**  
**Data Used to Estimate State-Level Construction Expenditures**

<b>Category</b>	<b>Corresponding NAICS Sectors</b>	<b>Maine Employment</b>	<b>United States Employment</b>	<b>Location Quotient*</b>
Site	Site Preparation Contractors	4,180	301,803	3.01
Facility	Oil & Gas Pipeline & Related Construction; Industrial Building Construction; Other Heavy Construction; Architectural, Engineering & Related Services	5,191	1,572,195	0.72
Equipment	Mining & Oil & Gas Field Machinery Manufacturing	NA	54,418	NA
Total	All	492,329	107,065,553	

Sources: United States Department of Labor (2003) and Authors’ Calculations\*.

As shown in table 4, construction of a \$400 million LNG terminal would lead to an estimated \$222.5 million of spending within the state over three years. Table 6 shows annual construction expenditures, and the direct annual labor income and employment impacts associated with facility construction. We use the Maine IMPLAN model (described below) to estimate the direct annual labor income impact, which can be interpreted as the amount of wages and benefits paid to workers directly involved in the construction project. Average wage and benefit levels in the impacted industries are from the U.S. Department of Labor. We divide the annual labor income figures (from the IMPLAN model) by the average wage and benefit levels (from the U.S. Department of Labor) to arrive at a direct employment estimate of 370 temporary workers involved in the construction project in each of the three years. (Downeast LNG may employ some of these workers, while others may work at various subcontractors located around the state.) This direct employment impact falls within the range of LNG facility construction impacts reported for other projects (see section 3).

**Table 6**  
**Estimated Annual State-Level Direct Impacts of LNG Facility Construction**

<b>Category</b>	<b>Estimated Annual In-State Expenditures*</b>	<b>Estimated Annual Labor Income**</b>	<b>Wages &amp; Benefits</b>	<b>Estimated Annual Employment*</b>
Site	\$8.3 million	\$2.5 million	\$46,909	53
Facility	\$65.8 million	\$21.6 million	\$67,951	317
Equipment	NA	NA	NA	NA
<b>Total</b>	<b>\$74.1 million</b>	<b>\$24.1 million</b>		<b>370</b>

Sources: Authors' Calculations\*, Maine IMPLAN (2005) Model\*\*, and United States Department of Labor (2003).

With the direct employment and labor income impacts in hand, we determine the statewide multiplier (i.e., indirect and induced) effects associated with construction of the LNG facility. The multiplier effects, which we estimate using the IMPLAN input-output model, account for the additional economic activity (i.e., jobs and income) supported by the spending of businesses (indirect effects) and workers (induced effects) involved with the construction project. The IMPLAN model tracks the flows of expenditures that occur among businesses in Maine, the purchases made by Maine workers, and the payments made to buy goods and services imported from out of state. Impact estimates presented in this report are from the IMPLAN model released in 2005, which is based on data from 2002.

Table 7 shows the total annual impacts of LNG facility construction on statewide employment and income. Including multiplier effects from the IMPLAN model, we estimate that construction of a \$400 million LNG facility would support 966 jobs over a three-year period. The employment multiplier of 2.61, calculated by dividing the total employment impact (966 jobs) by the direct employment impact (370 jobs), means that each worker directly involved with the construction project would support an additional 1.61 workers within the state.

**Table 7**  
**Estimated Annual State-Level Impacts of LNG Facility Construction**

	<b>Employment</b>	<b>Income</b>
Direct Impact	370*	\$24.1 million
Multiplier Effects	596	\$15.6 million
Total Impact	966	\$39.7 million
Computed Multiplier	2.61	1.65

Sources: Maine IMPLAN (2005) Model and Authors' Calculations\*.

In addition, the construction project would provide \$39.7 million in income to Maine workers in each of the three years that the facility is being built. The income multiplier of 1.65, calculated by dividing the total income impact by the direct income impact, implies that each dollar of direct income from the construction project would lead to an additional \$0.65 earned by Maine workers.

### **County-Level Impacts of Facility Construction**

The county-level impact of construction spending would depend on the local availability of businesses and workers needed to build the facility. Similar to the analysis presented above, we use a location quotient technique to estimate the proportion of the annual in-state construction spending (\$74.1 million shown in table 6) that would occur in Washington County. In this analysis, the location quotient measures the proportion of county-level employment in an industry relative to the proportion of total Maine employment in the same sector. A location quotient with a value greater than 1.0 implies that the sector is concentrated in Washington County relative to the state as a whole. We assume that a location quotient greater than or equal to 1.0 indicates that 100 percent of the in-state industry spending will occur in Washington County. On the other hand, a location quotient less than 1.0 suggests that the industry is less concentrated in Washington County than in the state as a whole. In cases where the location quotient is less than 1.0, we use the calculated value of the location quotient as an estimate of the proportion of in-state spending that is likely to occur in Washington County. (As noted above, the model does not account for the number of displaced workers from the area who may return to Washington County as a result of the project.) These estimates determine the number of local workers who may be employed by the project, but do not necessarily reflect increased activity for Washington County construction firms.

Table 8 shows the NAICS industrial sectors that correspond to the categories of construction spending, as well as Washington County and Maine employment levels in these sectors. Note that “heavy and civil engineering construction” and “construction of buildings” are broader industrial categories than used in the state-level analysis. (This is why the statewide “facility” employment figure is greater in table 8 [16,360 workers] than in table 5 [5,191 workers].) We use these sectors for Washington County because employment data are not disclosed for the more narrowly defined sectors of “other heavy construction” and “industrial building construction.” The county-level location quotients used to estimate the

proportion of in-state construction spending that takes place in Washington County are also presented in table 8.

**Table 8**  
**Data Used to Estimate County-Level Construction Expenditures**

<b>Category</b>	<b>Corresponding NAICS Sectors</b>	<b>Washington County Employment</b>	<b>Maine Employment</b>	<b>Location Quotient*</b>
Site	Site Preparation Contractors	79	4,180	1.09
Facility	Oil & Gas Pipeline & Structures Construction; Heavy and Civil Engineering Construction; Construction of Buildings; Architectural, Engineering & Related Services	158	16,360	0.56
Equipment	Mining & Oil & Gas Field Machinery Manufacturing	NA	NA	NA
Total	All	8,506	492,329	

Sources: United States Department of Labor (2003) and Authors' Calculations\*.

As shown in table 9, construction of a \$400 million LNG terminal would lead to an estimated \$45.1 million of annual construction spending in Washington County in each of three years. Using the IMPLAN model for Washington County, we estimate that Washington County workers directly involved in the construction project would receive \$11.6 million per year in wages and salaries. As before, we divide the annual labor income figures (from the IMPLAN model) by the average wage and benefit levels (from the U.S. Department of Labor) to arrive at a direct employment estimate of 184 Washington County workers involved in the construction project in each of the three years.

**Table 9**  
**Estimated Annual County-Level Direct Impacts of LNG Facility Construction**

<b>Category</b>	<b>Estimated Annual In-County Expenditures*</b>	<b>Estimated Annual Labor Income**</b>	<b>Wages &amp; Benefits</b>	<b>Estimated Annual Employment*</b>
Site	\$8.3 million	\$2.0 million	\$46,909	45
Facility	\$36.8 million	\$9.6 million	\$67,951	139
Equipment	NA	NA	NA	NA
Total	\$45.1 million	\$11.6 million		184

Sources: Authors' Calculations\*, Washington County IMPLAN (2005) Model\*\*, and United States Department of Labor (2003).

Table 10 shows the total annual impacts of LNG facility construction on county-level employment and income. Including multiplier effects from the IMPLAN model, we estimate that construction of a \$400 million LNG facility would support the employment of 375 Washington County workers over a three-year period. The employment multiplier of 2.04, calculated by dividing the total employment impact (375 jobs) by the direct employment impact (184 jobs), means that each Washington County worker directly involved with the construction project would support an additional 1.04 workers within the county.

**Table 10**  
**Estimated Annual County-Level Impacts of LNG Facility Construction**

	<b>Employment</b>	<b>Income</b>
Direct Impact	184*	\$11.6 million
Multiplier Effects	191	\$3.7 million
Total Impact	375	\$15.3 million
Computed Multiplier	2.04	1.32

Sources: Washington County IMPLAN (2005) Model and Authors' Calculations\*.

In addition, the construction project would provide \$15.3 million in income to Washington County workers in each of the three years that the facility is being built. The income multiplier of 1.32 is calculated by dividing the total income impact (estimated by the IMPLAN model) by the direct income impact. This implies that each dollar of income received by Washington County workers directly involved in the construction project would lead to an additional \$0.32 earned by workers within the county.

### **State-Level Impacts of Tugboat Manufacturing**

According to Downeast LNG, the company will spend \$24 million to purchase four tugboats that are manufactured in Maine. This spending represents another temporary impact that would occur in the years prior to when the LNG facility begins its operations. Table 11 shows the statewide economic impacts, including multiplier effects, associated with the manufacturing of tugboats in Maine. In this analysis, we assume that the boats will be built over a three-year period, and \$8 million of spending will occur in each year.

**Table 11**  
**Estimated Annual State-Level Impacts of Tugboat Construction**

	<b>Employment</b>	<b>Income</b>
Direct Impact	52	\$2.1 million
Multiplier Effects	35	\$1.1 million
Total Impact	87	\$3.2 million
Computed Multiplier	1.67	1.52

Source: Maine IMPLAN (2005) Model.

Results from the Maine IMPLAN model show that the annual expenditure of \$8.0 million in the boat building industry would directly support 52 jobs per year and provide \$2.1 million in annual labor income. Along with these direct impacts, the multiplier effects associated with spending by the boat builder and its workers amount to an estimated annual 35 jobs and \$1.1 million in labor income. In total, 87 temporary jobs and \$3.2 million in labor income would be generated per year. Since the tugboats are likely to be manufactured outside of Washington County, the local economic impacts would likely be minimal.

### **County- and State-Level Impacts of Facility Operations**

Once the facility is in operation, it will impact the economy through the creation of direct employment opportunities, and its purchases of goods and services from other businesses located within Washington County and the rest of Maine. These are long-term impacts because they will continue after the construction phase of the project. According to Downeast LNG, the facility operation would employ 78 workers, including 16 tugboat operators and 62 positions within the terminal. Tugboat operators' and facility workers' annual salaries, including benefits, are expected to average \$51,750 and \$69,000, respectively ([www.downeastlng.com](http://www.downeastlng.com)). In addition, Downeast LNG plans to purchase \$4.0 million worth of goods and services from other Maine businesses on an annual basis.

As in the analysis of facility construction, several factors will determine the number of Washington County residents who would find employment with the LNG facility. These include the availability of appropriately skilled workers (which may be affected by the training offered by Downeast LNG), and the wages paid by Downeast LNG compared with other jobs present in Washington County. It is reasonable to assume that Washington County residents would fill a high proportion of the 78 new positions, given the relatively small number of jobs involved compared with total county-level employment, the high wages paid by the facility, Downeast LNG's employee procurement strategy that gives preference to local workers, and the training programs offered by Downeast LNG. It is possible, however, that the facility may attract some skilled workers who may move to Washington County.

Likewise, the local availability of goods and services used by the LNG facility will determine the proportion of the \$4 million in anticipated annual spending (during the 30-year or longer lifecycle of the import terminal) that would take place in Washington County. Table 12 shows Downeast LNG annual spending projections by major industrial category, and our estimates for the amount of local expenditures. These estimates are based on the ratio of county- to state-level regional purchase coefficients, generated by the IMPLAN model for each sector. Based on this information from the IMPLAN model, we assume that the LNG facility would purchase \$2.35 million of goods and services in Washington County on an annual basis.

**Table 12**  
**Downeast LNG Annual Spending Projections**

<b>Industrial Sector</b>	<b>Total Spending</b>	<b>Estimated Washington County Expenditures*</b>
Services	\$2.0 million	\$552,000
Construction	\$1.5 million	\$1,500,000
Wholesale Trade	\$0.4 million	\$198,000
Retail Trade	\$0.1 million	\$97,000
<b>Total</b>	<b>\$4 million</b>	<b>\$2.35 million</b>

Sources: Downeast LNG and Authors' Calculations\*.

Table 13 shows a possible scenario of county-level economic impacts, including multiplier effects, associated with the annual operations of the proposed LNG terminal. This scenario assumes that Washington County residents would fill all 78 positions, and Downeast LNG would purchase \$2.35 million of goods and services locally. Under these assumptions, we use the Maine IMPLAN model to generate multiplier effects associated with facility operations. IMPLAN models estimates show that LNG facility operations would support a total of 187 jobs in Washington County. The employment multiplier of 2.40, which is calculated by dividing the total employment impact (187 jobs) by the direct employment impact (78 jobs), means that each worker directly employed by the LNG facility would support an additional 1.40 workers within the county.

**Table 13**  
**Estimated Annual County-Level Impacts of LNG Facility Operations**

	<b>Employment</b>	<b>Income</b>
Direct Impact	78*	\$5.1 million*
Multiplier Effects	109	\$3.0 million
Total Impact	187	\$8.1 million
Computed Multiplier	2.40	1.59

Sources: Washington County IMPLAN (2005) Model and Downeast LNG\*.

In addition, LNG facility operations would provide \$8.1 million in income to Washington County workers annually over the LNG import terminal's lifecycle, which is expected to be 30 years or longer. The income multiplier of 1.59 is calculated by dividing the total income impact by the direct income impact. This implies that each dollar of direct income received by LNG facility employees in Washington County would lead to an additional \$0.59 earned by workers within the county.

Table 14 shows the statewide economic impacts associated with the annual operation of the proposed LNG terminal. Including multiplier effects from the IMPLAN model, we estimate that facility operations would support an estimated 253 jobs in Maine during the lifecycle of the import terminal. As discussed at the beginning of this section, the statewide impact of

253 jobs includes the county-level impact of 187 jobs. The statewide employment multiplier of 3.24 is calculated by dividing the total employment impact (estimated by the IMPLAN model) by the direct employment impact. It implies that each worker directly employed by the LNG facility would support an additional 2.24 workers within the state.

**Table 14**  
**Estimated Annual State-Level Impacts of Facility Operations**

	<b>Employment</b>	<b>Income</b>
Direct Impact	78*	\$5.1 million*
Multiplier Effects	175	\$5.6 million
Total Impact	253	\$10.7 million
Computed Multiplier	3.24	2.10

Sources: Maine IMPLAN (2005) Model and Downeast LNG\*.

Finally, estimates from the Maine IMPLAN model show that LNG facility operations would provide \$10.7 million in income per year to Maine workers. The statewide income multiplier of 2.10 is calculated by dividing the total income impact by the direct income impact. This implies that each dollar of direct income received by LNG facility employees in Maine would lead to an additional \$1.10 earned by workers within the state.

## **5. FISCAL IMPACTS OF THE PROPOSED DOWNEAST LNG FACILITY**

In this section, we examine the fiscal impacts of the proposed Downeast LNG facility. Fiscal impacts are the changes to state and local government revenues and expenditures associated with the LNG project. First, we examine the impacts of the proposed facility on the local government. Second, we look at the impacts of the LNG project on state government finances. The fiscal impact analysis is based on Maine's current tax and educational spending system, and data from 2004 and 2005. Thus, our findings can be interpreted as the fiscal impacts of an LNG facility if it were being constructed or in operation at the present time.

### **Fiscal Impact Analysis Summary**

To summarize the results from the fiscal impact analysis, we find that the presence of a \$400 million LNG facility in Robbinston could lower the town's full value tax rate by 69.1%. Based on the assumptions discussed below, we estimate that Downeast LNG would pay \$1.2 million in local property taxes on an annual basis once the facility is in operation. This would amount to 92.1% of the total property taxes paid in Robbinston.

Economic activity associated with the proposed Downeast LNG facility would impact the state government through increased corporate and income tax revenues, and additional sales tax receipts. Our estimates show that workers directly and indirectly associated with facility construction and tugboat manufacturing would pay \$1.4 million in state income taxes per year in each of three years of pre-operations activities. The direct and indirect economic activity from facility construction and tugboat manufacturing would also generate an estimated \$1.3 million in state sales taxes during each of the three years that construction is taking place.

Once the facility is in operation, we estimate that Downeast LNG would pay between \$625,000 and \$1.79 million in corporate income taxes annually. Workers who are directly and indirectly supported by the facility would pay \$539,268 in state income taxes annually over the lifecycle of the terminal, expected to be 30 years or longer. Finally, the economic activity associated with facility operations would generate an estimated \$246,282 in state sales tax revenue per year.

### **Town-Level Fiscal Impacts**

The local tax rate applied to real and personal property is computed as a municipality's total spending commitment (i.e., expenditures) divided by the assessed value of real and personal property (i.e., local tax base). According to Maine Revenue Services, Robbinston had a total taxable value of real and personal property of \$21.46 million in 2004. The town had a 2004 spending commitment, as reported by Maine Revenue Services, of \$321,914. This results in a tax rate of 0.015.

In some cases, the local taxable (i.e., assessed) value of real and personal property is lower than the market value of real and personal property, which Maine Revenue Services refers to as the full "state value." Maine Revenue Services has a set of rules and formulas that are

used to convert a municipality's taxable value of real and personal property to the full state value. The process that Maine Revenue Services uses to calculate full state value takes about 18 months to complete, so the full state value for any given year is based on the local taxable value of real and personal property from two years earlier. Thus, the 2006 full state value is based on the taxable value of real and personal property reported in the 2004 *Municipal Return Statistical Summary*. According to Maine Revenue Services, Robbinston has a 2006 full state valuation of \$33,050,000. Dividing the town's 2004 spending commitment by the 2006 full state valuation, we arrive at a full value property tax rate of 0.0097.

The presence of an LNG import terminal would lead to changes in both the municipality's expenditures and the size of local tax base. If assessed at its full, anticipated construction cost of \$400 million, the LNG terminal would increase the 2006 full state value of real and personal property from \$33.05 million to \$433.05 million. This would lead to a substantial decrease in the full-value property tax rate. However, the large increase in the local tax base would also lead to several additional changes in local government expenditures and revenues. These changes, described in more detail below, include an increase in the town's county tax obligations, a decrease in the amount of education subsidies received from the state government, and a decrease in the amount of funding Robbinston receives through state and municipal revenue sharing.

An increase in the size of the local tax base resulting from the LNG facility would increase the amount of taxes paid by Robbinston to the Washington County government. Washington County has a 2005 full state valuation of real and personal property, based on 2003 local assessed values of real and personal property, of \$2.39 billion. At a full-value tax rate of 0.00178, Washington County will collect a combined \$4.26 million in taxes from all county municipalities and unorganized territories in 2005. Robbinston has a 2005 state valuation of \$30.95 million, which means it will pay \$55,097 in taxes to Washington County. If the LNG facility led to a \$400 million increase in 2005 total state valuation, the county full state value tax rate would drop to 0.00153 and Robbinston's share of county taxes would increase to \$657,233. Thus, if it were in operation at the present time, the LNG facility would result in a \$602,136 increase in county tax obligations to Robbinston.

A large increase in the local tax base would also lower the amount of education subsidies Robbinston receives from the state government, since the subsidy is tied to the town's full state valuation. Based on the new Essential Programs and Services funding formula, the Maine Department of Education calculates that Robbinston will receive \$454,603 in state subsidies for the year 2005-06. A \$400 million increase in the town's state valuation would decrease the subsidy to the state minimum, which in this case amounts to \$95,293 (equivalent to 84 percent of special education costs). Thus, if it were in operation at the present time, the increased valuation associated with the LNG facility could result in a \$359,310 decrease in state subsidies for local education.

The town-level fiscal impacts described above (i.e., increase to local tax base, decrease in state school subsidies, increase in county tax payments) would influence the amount of funding Robbinston receives through state and municipal revenue sharing. The Maine State Treasurer's Office estimates that Robbinston will receive an FY 2006 revenue sharing distribution of \$27,295. The \$400 million increase to the full state value of real and personal property and other estimated changes to local government expenditures and revenues would

lower the revenue sharing distribution to \$7,684. Thus, changes associated with the facility would decrease the amount of state and municipal revenue sharing by an estimated \$19,611.

Finally, the construction and operations of the LNG facility could lead to additional local costs of providing public services. As of the 2000 U.S. Census, Robbinston had a population of 525 people. Based on the direct employment impact of 370 workers, we estimate the number of people in the area at certain (i.e., peak) times of the construction project could increase to 895 residents and temporary workers. (We do not assume, however, that the temporary construction workers will live in Robbinston.) Once the terminal is in operation, facility operations and visitors could place permanent demands on local public services. Downeast LNG has committed to “compensate for construction period impacts of significance” and cover the “additional police or fire costs directly associated with the LNG terminal” (Downeast LNG 2005, p. 13).

The fiscal impacts outlined above would increase the town’s total spending commitment from \$302,944 to an estimated \$1,302,971. Along with a \$400 million increase in the full state value of real and personal property, this would lead to a reduction in the full value property tax rate from 0.0097 to 0.0030. This assumes no additional development in Robbinston and that the community does not choose to increase expenditures on local public services. Under this scenario, Downeast LNG would pay \$1.2 million in local property taxes, which amounts to 92.1% of the total property taxes paid in Robbinston. The reduction in the full state value tax rate would lower the property taxes paid by local homeowners and businesses. As a hypothetical example, the property tax bill on a home or business with land and buildings that have a market value of \$100,000 could see their annual property tax payments decrease from \$970 to \$300, which is a reduction of 69.1%.

### **State-Level Fiscal Impacts**

Economic activity associated with the proposed Downeast LNG facility would impact the state government primarily through increased corporate and income tax revenues, and additional sales tax receipts. According to Downeast LNG, the facility would likely earn a profit of \$7 million in its first year of operation. Profits would increase to a projected \$20 million per year after the debt service is retired in year 12 of operations. Based on these projections and the current state corporate income tax rate of 8.93%, we estimate that Downeast LNG would pay between \$625,000 and \$1.8 million in corporate income taxes annually.

The Maine IMPLAN model provides an estimate of the state income tax revenues associated with LNG facility construction, tugboat manufacturing and facility operations. As noted above, the facility construction and tugboat manufacturing impacts are temporary in nature, planned to occur over a three-year period. Tax impacts from the Maine IMPLAN model show that workers directly and indirectly associated with facility construction and tugboat manufacturing would pay \$1.4 million in state income taxes per year in each of three years. Estimates from the Maine IMPLAN model show that, once the LNG terminal is in operation, workers who are directly and indirectly supported by the facility would pay \$539,268 in state income taxes annually over the lifecycle of the terminal, expected to be 30 years or longer.

Finally, the Maine IMPLAN model provides an estimate of the state sales tax receipts associated with business and household spending. The direct and indirect economic activity from facility construction and tugboat manufacturing would generate an estimated \$1.3 million in sales taxes during each of the three years that construction is taking place. Once the terminal is constructed, the total economic activity associated with facility operations would generate an estimated \$246,282 in annual state sales tax revenue.

## 6. SUMMARY

This report focuses on the economic and fiscal impacts of three aspects of the Downeast LNG facility: (1) terminal construction, (2) purchase of tugboats manufactured by a Maine company, and (3) terminal operations. Tables 15 and 16 provide a summary of the estimated economic and fiscal impacts associated with pre-operations activities (i.e., construction and tugboat purchases) and facility operations.

**Table 15**  
**Estimated Annual Economic and Fiscal Impacts Associated with**  
**Downeast LNG's Pre-Operations Activities (Duration: 3 years)**

	<b>Direct Impact</b>	<b>Multiplier Effects</b>	<b>Total Impact</b>
<b>State-Level Economic Impacts</b>			
<b>Facility Construction:</b>			
Employment	370	596	966
<i>Income</i>	\$24.1 million	\$15.6 million	\$39.7 million
<b>Tugboat Manufacturing:</b>			
Employment	52	35	87
<i>Income</i>	\$2.1 million	\$1.1 million	\$3.2 million
<b>Total Pre-Operations Activities:</b>			
Employment	422	630	1,053
<i>Income</i>	\$26.2 million	\$16.7 million	\$42.9 million
<b>County-Level Economic Impacts</b>			
<b>Facility Construction:</b>			
Employment	184	191	375
<i>Income</i>	\$11.6 million	\$3.7 million	\$15.3 million
<b>Tugboat Manufacturing:</b>			
Employment	NA	NA	NA
<i>Income</i>	NA	NA	NA
<b>Total Pre-Operations Activities:</b>			
Employment	184	191	375
<i>Income</i>	\$11.6 million	\$3.7 million	\$15.3 million
<b>Fiscal Impacts:</b>			
State Personal Income Taxes: \$1.4 million			
State Sales Taxes: \$1.3 million			

**Table 16**  
**Estimated Annual Economic and Fiscal Impacts Associated with**  
**Downeast LNG's Operations (Duration: 30 years or longer)**

	<b>Direct Impact</b>	<b>Multiplier Effects</b>	<b>Total Impact</b>
<b>State-Level Economic Impacts</b>			
Employment	78	175	253
<i>Income</i>	\$5.1 million	\$5.6 million	\$10.7 million
<b>County-Level Economic Impacts</b>			
Employment	78	109	187
<i>Income</i>	\$5.1 million	\$3.0 million	\$8.1 million
<b>Fiscal Impacts:</b>			
State Personal Income Taxes: \$539,268			
State Sales Taxes: \$246,282 million			
State Corporate Income Taxes: \$625,000 - \$1.8 million			
Municipal Property Taxes: \$1.2 million			

Downeast LNG's pre-operations activities would support a total of 1,053 jobs throughout Maine in each of three years. These workers would receive a combined total of \$42.9 million in income per year. Such an increase in employment would be equivalent to 0.15% of total state employment as of 2004. Construction of the LNG facility would support a total of 375 jobs in Washington County, counted in the statewide impact of 1,053 jobs, in each of the three years of the construction project. These workers would receive an estimated \$15.3 million in income per year. An impact of 375 new jobs would be equivalent to 2.67% of total employment in Washington County as of 2000.

Once the facility is in operation, its activities would support a total of 253 jobs across Maine over the lifecycle of the LNG import terminal, which is expected to be 30 years or longer. These workers would receive an estimated \$10.7 million in income per year. A statewide impact of 253 jobs would be equivalent to 0.036% of total state employment as of 2004. Focusing on local impacts, we find LNG facility operations would support a total of 187 jobs in Washington County over the terminal's lifecycle. These workers would receive an estimated \$8.1 million in income per year. A county-level impact of 187 jobs would be equivalent to 1.33% of total employment in Washington County as of 2000.

Turning to the fiscal impacts, we find that the presence of a \$400 million LNG facility in Robbinston would lower the town's full value tax rate by 69.1%. Based on the assumptions discussed earlier in the report, we estimate that Downeast LNG would pay \$1.2 million in

local property taxes on an annual basis once the facility is in operation. This would amount to 92.1% of the total property taxes paid in Robbinston.

LNG terminal activities would impact the state government through increased corporate and income tax revenues, and additional sales tax receipts. Our estimates show that workers directly and indirectly associated with facility construction and tugboat manufacturing would pay \$1.4 million in state personal income taxes per year in each of three years of pre-operations activities. The direct and indirect economic activity from facility construction and tugboat manufacturing would generate an estimated \$1.3 million in sales taxes during each of the three years that construction is taking place.

Once the facility is in operation, we estimate that Downeast LNG would pay between \$625,000 and \$1.8 million in corporate income taxes annually. Workers who are directly and indirectly supported by the facility would pay \$539,268 in state personal income taxes annually over the lifecycle of the terminal, expected to be 30 years or longer. Finally, the economic activity associated with facility operations would generate an estimated \$246,282 in state sales tax revenue per year.

### **Study Limitations**

Any study that attempts to measure the impact of a business or industry is subject to limitations regarding the scope of the issues that the research can address. Furthermore, the findings reported in these types of studies are, at least partially, influenced by information gathered from secondary sources and assumptions made by the researchers. For example, our economic impact estimates rely on employment and spending projections provided by Downeast LNG. (Downeast LNG based these projections upon comparable LNG projects and its own estimations specific to its individual project design and new regulations.) If actual employment and spending deviate from original projections, the associated economic impacts given in this report may not be realized. Likewise, our fiscal impact estimates are based upon the assumption that Downeast LNG will not receive a financial incentive from the state or local government. If a tax incentive is provided to Downeast LNG, the actual fiscal impacts of the facility may differ from those presented in this report. (To our knowledge, Downeast LNG has not requested, nor does it intend to request, such a state or local financial incentive.)

When considering and interpreting the study findings, it is important to understand that there may be other economic and non-economic impacts beyond those covered in this report. Other issues that were not addressed in the report include environmental, homeland security, and energy security impacts of the LNG facility. Thus, findings presented in the report should be interpreted as a part, but not the whole, of the evidence in evaluating the effect of the proposed LNG facility.

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