
An Economic Impact Analysis of the Proposed Tacoma Manufacturing & Marine Export Facility

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Prepared for:

NW Innovation Works

ECONorthwest

ECONOMICS • FINANCE • PLANNING

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Introduction

Background

Northwest Innovation Works Tacoma, LLC (NWIW) engaged ECONorthwest for an economic impact analysis. NWIW proposes to construct and operate a methanol manufacturing plant in Tacoma, Washington.

The plant will be called the Tacoma Manufacturing and Marine Export Facility (TMMEF). It will occupy land owned by the Port of Tacoma along the Puget Sound. The Port is about 32 miles south of downtown Seattle in Pierce County, Washington. Tacoma is the third biggest city in the state.

TMMEF will convert natural gas into the simplest form of alcohol—methanol, which is also known as wood alcohol. TMMEF will manufacture methanol, store it on-site, and then transfer it onto oceangoing vessels for export to Asia. The methanol will be sold to produce olefins and other chemicals that are widely used in a broad range of consumer products.

Impact Analysis Parameters

ECONorthwest divides the impact analysis into two parts. The first covers the impacts of plant construction at the Port of Tacoma. The second analysis measures the impacts of an average year of plant operations.

Construction will span five years, beginning September 2018 and concluding December 2022. It will be done in two phases. ECONorthwest estimated the economic impacts of construction by year and in total. The direct impacts encompass construction at the site by NWIW and its contractors.

Operations from phase one construction are assumed to begin in 2021. Production from the second phase will commence in 2023.

At full capacity, the plant could produce 7.3 million metric tonnes of methanol in a year. However, in practice, the plant should average 92 percent of capacity over a full year. At that rate, TMMEF would export 6.716 million metric tonnes of methanol requiring about 70 vessel calls a year. This is the anticipated activity in an average operating year that ECONorthwest assumed in the economic impact analysis.

NWIW gave ECONorthwest plant construction costs and operating expenses expressed in 2018 dollars.¹ That is the year construction starts. For consistency, ECONorthwest reports all economic impacts and construction costs in 2018 dollars.

Affected Region

By definition, the direct impacts of plant construction and operations occur at TMMEF. The direct impacts trigger subsequent indirect and induced impacts throughout the regional economy.

ECONorthwest used the official Seattle-Tacoma Consolidated Statistical Area (CSA), which is composed of nine counties.² The region includes the major cities and bedroom communities surrounding Seattle and Tacoma. Thus, it describes the appropriate geography of businesses and potential workers impacted by the proposed methanol plant. The area consists of the following nine counties:

- Island County, Washington
- King County, Washington
- Kitsap County, Washington
- Lewis County, Washington
- Mason County, Washington
- Pierce County, Washington
- Skagit County, Washington
- Snohomish County, Washington
- Thurston County, Washington

The nine-county (local) region has a deep labor market of nearly 2.4 million workers.³ ECONorthwest expects and assumes in the impact analysis that all the workers at the plant in a typical operating year would be residents in the region. This expectation is based on an analysis of U.S. Census data, which shows 96.9 percent of those working in the CSA also live in the CSA.⁴

¹ ECONorthwest used its own forecast, which shows about 6.4 percent inflation from 2015 to 2018, which is equivalent to a 2.09 percent annual inflation rate.

² *Revised Delineation of Metropolitan Statistical Areas, Micropolitan Statistical Areas, and Combined Statistical Areas, and Guidance on Uses of the Delineation of These Areas*. OMB Bulletin No. 15-01. July 15, 2015.

³ US Bureau of Labor Statistics. Local area unemployment statistics. Preliminary data for December 2015 extracted February 24, 2016 from the BLS website <http://data.bls.gov/cgi-bin/dsrv>.

⁴ Calculated by ECONorthwest using U.S. Census Bureau, OnTheMap application and LEHD Origin-Destination Employment Statistics for the CSA in 2013.

Economic Impacts from Construction

Construction projects stimulate economic impacts. They do so by spending money on goods and services, and by providing jobs. ECONorthwest calculated the economic impacts of the TMMEF construction project on the nine-county region. The first step in this analysis is determining how much the construction project would cost and how much of that would go to local businesses and workers.

Construction Value and Local Content

Methanol plant construction is a major undertaking. This plant would be the second methanol plant on the West Coast. As such, much of the equipment and engineering work necessary will come from outside the local region.

NWIW will ship some major components into Tacoma. This includes air separation units and distillation columns. Local labor will unload them from ships and install them at the jobsite, but the work going into building these large components will be done elsewhere. This type of equipment is not locally available.

Other aspects of constructing the methanol plant are readily available from local sources. Supplies of steel, concrete, piping, fabricated metal products, and many industrial components are available or manufactured in the region. Heavy industry is a dominant sector. The region ranks 10th nationally in total manufacturing jobs versus 100 metropolitan areas.⁵

Total Construction Costs

NWIW anticipates spending about \$3.6 billion (in 2018 \$) to construct TMMEF. ECONorthwest determined the portion of that subject to the 9.6 percent retail sales tax in Tacoma, in accordance to Washington law, is about \$1.16 billion.⁶ Considering this, ECONorthwest estimates \$110.9 million in construction sales tax, as shown in Table 1. The value of construction before this tax is approximately \$3.49 billion.

⁵ Helper, S., T. Krueger, and H. Wial. "Location of American Manufacturing: Trends in the Geography of Production" Brookings Metropolitan Program. (2012).

⁶ WAC 458-20-170(4)(a)

Table 1: TMMEF Construction Cost, Millions of 2018 \$

Construction Costs (Mn. 2018 \$)	Project Total	Local Spending
Engineering & related professional fees	\$ 122.5	\$ 6.1
EPC excluding equipment installation	753.9	571.7
EPC equipment installation	408.4	408.4
Air separation units	800.0	-
Methanol storage tanks	200.0	20.0
Control system	24.0	-
Equipment rental, crantage	73.8	60.0
Loading arm	3.0	-
Emergency shutdown system	6.0	-
Civil engineering work	143.0	107.9
Distillation columns, other equipment	800.0	-
Sales tax on construction	110.9	-
Miscellaneous consumables	154.5	136.8
Total Construction Costs	\$ 3,600.0	\$ 1,311.0

Source: NWIW. Construction budget includes taxes. The analysis excludes taxes in the calculation of economic impacts.

Relevant to economic impact analysis are the purchases of goods, services, and labor from the local region. That is locally sourced direct impacts. These affect the local economy causing indirect impacts on businesses and induced impacts on households. ECONorthwest estimates about \$1.31 billion of total construction labor, goods, and services spending (pre sales tax) will come from the local area.

Local Labor Market

As shown in Table 2, the nine-county area has nearly 2.4 million workers. According to the US Bureau of Labor Statistics (BLS), the CSA's unemployment rate was 5.2 percent for the most recent period (December 2015). Pierce County has an unemployment rate of 6.1 percent.

Table 2: CSA Labor Force and Unemployment Rates by County, Preliminary Data December 2015, BLS

County	Labor Force	Unemployment Rate
Island	32,061	6.1%
King	1,171,935	4.5%
Kitsap	115,903	5.5%
Lewis	31,962	8.3%
Mason	23,489	7.9%
Pierce	400,895	6.1%
Skagit	56,287	7.0%
Snohomish	399,818	5.0%
Thurston	127,463	5.9%
CSA Total	2,359,813	5.2%

Source: US Bureau of Labor Statistics

Table 3 is a list of the non-supervisory construction trade workers needed to build the TMMEF. There are 876 in total, although in any given month fewer will be at the jobsite as not all trades work at the same time. The mix varies depending on the stage of construction. The data compare the numbers of workers by occupation needed for construction to the numbers of workers in each occupation working in the local area.⁷ In all cases, the number working available in the labor market for each occupation exceeds what is needed at the Tacoma site.

⁷ Source: BLS Occupational Employment Statistics for King, Snohomish, Pierce, Kitsap, Skagit, and Thurston counties accessed from <http://www.bls.gov/oes/home.htm> on February 23, 2016. Data exclude engineers, managers, and longshoremen.

Table 3: Construction Labor Occupations Needed for the Tacoma Plant Versus Working in the Region in May 2014, BLS

Construction Workers	Needed at Tacoma Site	Working in the Region*	Occupation Code
Expeditor / Materials Clerk	16	10,780	43-5071
Equipment Operator	40	3,910	47-2073
Millwright	60	420	49-9044
Iron Workers	35	1,060	47-2221
Riggers	25	60	49-9096
Pipefitter	200	6,040	47-2152
Welder	200	3,580	51-4121
Electrical / Control	85	8,670	47-2111
Carpenter	25	14,120	47-2031
Mason	30	340	47-2021
Apprentices	100	1,290	47-3011-19
Laborer	60	11,870	47-2061
	876	62,140	

Sources: NWIW and BLS.

* The CSA excluding Island, Mason, and Lewis counties that are not reported separately by the BLS.

TMMEF is a two-phase construction project with each phase bringing 3.65 MMT of capacity to the project. The first phase starts September 2018 with 41 working on site preparation. The first phase runs through October 2020. Employment peaks at 1,000. The second phase adds another 3.65 MMT of capacity to TMMEF and runs from November 2020 through December 2022.

An impact analysis uses a simple measure of employment called job years. A job year is twelve months of work. There are no adjustments for overtime or part-time work. Some jobs will last more than two years, while others will last for only a few months.

Table 4 lists each month of construction and the number of jobs at the TMMEF jobsite. We calculated annualized employment in job years by adding the number of jobs in each month in each year, and dividing by 12 months. For the entire 52-month period, construction requires 1,683 job years in Tacoma. This includes all types of jobs—construction trades, longshoremen, engineers, project managers, laborers, supervisors, and administrative support personnel.

Note that much of the equipment installation employment is not counted as direct employment. Installation workers are provided by equipment manufacturers and are considered indirect jobs.

Table 4: Jobs by Month at the TMMEF Construction Site

Year/Month	Jobs in Month	Job Years	Year/Month	Jobs in Month	Job Years
2018:					
September	41				
October	83				
November	113				
December	188				
2018 Subtotal	424	35			
2019:			2021:		
January	188		January	188	
February	263		February	263	
March	300		March	300	
April	350		April	350	
May	425		May	425	
June	500		June	500	
July	500		July	500	
August	1,000		August	1,000	
September	1,000		September	1,000	
October	675		October	675	
November	650		November	650	
December	600		December	600	
2019 Subtotal	6,450	538	2021 Subtotal	6,450	538
2020:			2022:		
January	600		January	600	
February	525		February	525	
March	488		March	488	
April	450		April	450	
May	338		May	338	
June	263		June	263	
July	225		July	225	
August	150		August	150	
September	113		September	113	
October	75		October	83	
November	113		November	75	
December	188		December	41	
2020 Subtotal	3,525	294	2022 Subtotal	3,349	279
Construction Project Five-Year Total				20,198	1,683

Sources: NWIW and calculations by ECONorthwest

Local and Non-Local Construction Labor

Both locally hired and non-local labor brought into the region to construct a plant cause economic impacts. Knowing the share of non-local construction workers is important. Local hires have decidedly greater impacts because their households live in the CSA. They spend most of their incomes at businesses in the nine-county local region.

Non-local hires are transient. They spend a little locally for temporary living expenses, but remit the bulk of their money back to their hometowns where it gets spent far from the area around the construction site.

U.S. Census tracks worker residencies. ECONorthwest used the most recent data (2013) and found that 92.9 percent of construction industry workers employed in Pierce County reside in the nine-county region.⁸ Non-locals are 7.07 percent of the total. NWIW should draw a similar proportion of local workers. The wages and benefits earned by them from the project would raise the incomes of construction worker and management households, thus, inducing economic impacts in the region.

Non-local workers would temporarily reside in the region and send their earnings back to the households outside of the CSA. Thus, their wages and benefits have no impact on the regional economy.

However, as is customary, itinerant workers receive *per diems*, which come from construction companies and pay for itinerant worker temporary housing, meals, and incidentals; they are a cost of construction. ECONorthwest classifies them as a labor cost and estimates approximately \$3.79 million in *per diem* over the 52-month project.

Table 5 recasts the costs of the construction project between labor, sales taxes, and other inputs. From the \$3.6 billion total, \$1.31 billion directly impacts the local economy and are modeled as such in this analysis. It is this local spending on goods, services, and labor that trigger subsequent impacts on the local economy. The model excludes wages paid to workers that live outside the CSA, but does include the *per diem* spending by those itinerant workers since that spending goes to local restaurants, lodging, and the like.

⁸ U.S. Census Bureau, Center for Economic Studies, Longitudinal-Employer Household Dynamics Program. 2013. OnTheMap Application. Retrieved June 15, 2015 from <http://onthemap.ces.census.gov/>

Table 5: Construction Project Total Versus Direct Regional Inputs

TMMEF Construction Costs (Mn. 2018 \$) & Job Years of Labor	Total	Local Direct Impact
Materials, equipment, fuel, fees & services	\$ 3,224.6	\$ 1,064.9
Local labor, wages & benefits	242.3	242.3
Labor per diems for transient workers	3.8	3.8
Itinerant labor, wages & benefits	18.4	-
Sales tax	110.9	-
Total Construction	\$ 3,600.0	\$ 1,311.0
Labor (job years)	1,683	1,564

Sources: NWIW and calculations by ECONorthwest.

* By convention, local sales taxes are not considered a direct economic impact.

Sales taxes are not considered a source of economic impacts by IMPLAN even though much of it would go towards state and local government spending. Economic impact models assume government spending levels are fixed such that higher taxes collected from the construction project offset the need for higher revenues (*i.e.* taxes) elsewhere.

Results of Economic Impact Analysis of Construction

ECONorthwest used the 2013 version of IMPLAN and built an economic impact model for the nine-county region. ECONorthwest made the appropriate adjustments for inflation and reports the impacts in 2018 dollars, which is the standard NWIW used in its construction budgeting.

The analysis shows that the \$3.6 billion project, of which \$1.31 billion is spent on local labor, goods, fees, and services, will affect almost \$2.2 billion in economic output in the CSA through the combined direct, indirect impacts (spending by businesses and governments) and induced impacts (spending by persons). Table 6 shows the cumulative impacts over the five-year construction period.

Table 6: Cumulative Local Economic Impacts of TMMEF Plant Construction, 2018 - 2022

Impacts	Total Project Costs & Employment	Local Direct Impacts	Local Indirect Impacts	Local Induced Impacts	Total Local Impacts
Output (Mn. 2018 \$)	\$ 3,600.0	\$ 1,311.0	\$ 561.4	\$ 311.4	\$ 2,183.7
Labor Income (Mn. 2018 \$)	264.5	246.1	163.3	296.3	705.7
Employment (Job-Years)	1,683	1,564	2,553	3,443	7,560

Note: Direct local employment excludes jobs held by non-residents.

Major industrial construction projects have large labor impacts because they employ highly compensated construction and equipment installation workers. For every one job-year at the construction project, there would be 4.5 jobs in the local economy. That is a high ratio because most equipment installers count as indirect, not direct, jobs. Also, construction labor is highly compensated and since nearly 92.9 percent live in the nine-county area, their household spending stimulates substantial induced job impacts.

In total, locally \$705.7 million in labor income (wages, salaries, and benefits) would be traced back to the \$264.5 in direct labor income at the TMMEF jobsite earned over the 52 months of construction.

Economic Impacts from Operations

The plant will begin production in 2021, but reach full production after the second phase is put in place. The first year of full production will be 2023. Operations involve local purchases and employment, which in turn cause economic impacts. For purposes of calculating these impacts, ECONorthwest used operating estimates from NWIW for an average year. As with the construction analysis, for consistency values are expressed in 2018 dollars.

Operating Parameters and Employment

The economic impact model ECONorthwest built for the Tacoma plant runs off of the payroll and goods and services forecast from NWIW. As with construction, only plant expenditures going to local workers and businesses count as having effects on the nine-county regional economy.

Value of Output

The most basic parameter for operations is the value of output. ECONorthwest calculated this value by multiplying the export price of methanol, applying an inflation forecast, and multiplying by the projected output of TMMEF. In most impact studies, output drives the economic impact forecast. However, that is not the case for this analysis.

Since there are no other methanol plants in the region, ECONorthwest ran its analysis using NWIW's payroll and operating costs forecast. The value of direct output completed the analysis, but has no effect on determining other local economic impacts.

The methanol plant has a capacity of 7.3 million metric tonnes per year and, because of routine maintenance, repairs, and scheduling, will operate at an average rate of 92 percent of capacity. Thus, the economic impact analysis assumes TMMEF would produce 6.716 million metric tonnes of methanol for export a year.

The US export price for methanol is about \$365 a metric tonne.⁹ In 2018 dollars, it would be approximately \$383. At that price and expected volume, TMMEF would have a direct output of \$2.57 billion.

⁹ US Census trade statistics, US exports of methanol Jan-Mar 2015 converted to \$/MT

Methanol is a commodity. Its export price and demand fluctuate. The value of the plant's output will vary. What is shown in this analysis is illustrative of the operation's size, but the local impacts are not contingent upon output value. Impacts depend on plant spending and payrolls.

Direct Operating Labor

NWIIW will employ about 260 full-time workers, including executive and administrative staff, at its plant. Payroll, which includes all benefits, taxes, wages, salaries, and other similar expenses, will be about \$30.4 million a year.

ECONorthwest compared the occupations of the 260 future employees at the plant with the number working in each occupation within commuting distance of Tacoma in the CSA. The BLS reports a deep labor pool for all occupations needed at the TMMEF, as shown on Table 7.

Table 7: Occupations and Employees for Plant Operations at TMMEF Versus Local Availability in May 2014, BLS

Plant Operations Employees	Needed at TMMEF	Working in the Region	Occupation Code	BLS Occupation Title
Administration				
General Manager	1	22,830	11-1021	General & Operations Managers
HR Manager	1	2,310	11-3121	Human Resources Managers
Procurement	3	7,900	13-1023	Purchasing Agents, Except Wholesale, Retail, & Farm Products
Sales Manager	2	6,070	11-2022	Sales Managers
Manager	2	3,450	11-3011	Administrative Services Managers
Accounting	6	22,090	13-2011	Accountants & Auditors
IT Manager	2	8,100	11-3021	Computer & Information Systems Managers
Specialist	5	23,430	13-1199	Business Operations Specialists, All Other
Assistant	3	8,730	43-6011	Executive Secretaries & Executive Administrative Assistants
Clerical/Office support	12	28,670	43-9061	Office Clerks, General
Technical Management				
Plant Manager	1	1,900	11-3051	Industrial Production Managers
Production Manager	1	5,410	11-9199	Managers, All Other
Maintenance Manager	1	5,410	11-9199	Managers, All Other
HSE Manager	1	270	17-2111	Health & Safety Engineers, Except Mining Safety Engineers & Inspectors
Technical Staff				
Process Engineer	4	5,930	17-2112	Industrial Engineers
Laboratory Supervisor	1	740	19-2031	Chemists
Laboratory	11	490	19-4099	Life, Physical, & Social Science Technicians, All Other
Production Staff				
Shift Supervisor	8	7,840	51-1011	First-Line Supervisors of Production & Operating Workers
Control Room Operator	26	110	51-8092	Gas Plant Operators
Process Operator U&O	41	1,010	51-8093	Petroleum Pump System Operators, Refinery Operators, & Gaugers
Operator	26	1,740	51-9199	Production Workers, All Other
Security Guard	8	13,510	33-9032	Security Guards
Maintenance Staff				
Mechanical Engineer	2	4,720	17-2141	Mechanical Engineers
E&I Engineer	2	4,410	17-2071	Electrical Engineers
Draftsperson/Planner	2	2,050	17-3013	Mechanical Drafters
Workshop Foreperson	6	30	49-9069	Precision Instrument & Equipment Repairers, All Other
Mechanic	30	3,030	49-9041	Industrial Machinery Mechanics
Welder	7	3,580	51-4121	Welders, Cutters, Solderers, & Brazers
E&I Technical Foreperson	12	280	49-9012	Control & Valve Installers & Repairers, Except Mechanical Door
Electrical Foreperson	5	1,040	49-2094	Electrical & Electronics Repairers, Commercial & Industrial Equipment
Instrumentation	21	2,490	49-9099	Installation, Maintenance, & Repair Workers, All Other
Logistics				
Store Supervisor	1	1,480	43-5011	Cargo & Freight Agents
Store Person	6	10,780	43-5071	Shipping, Receiving, & Traffic Clerks
Total	260	206,420		

Sources: NWIIW, the US Bureau of Labor Statistics, and calculations by ECONorthwest

Operating Expenses

The largest operating expense for a methanol plant is natural gas. All of the natural gas used in Tacoma is produced outside of the region. The second largest expense is ocean shipping; this too is largely not local. Therefore, the two largest inputs have no local economic impacts. Most of the other goods and services that TMMEF will need each year are available locally in whole or part.

In whole, electricity and water utility services are entirely local purchases. So too are the Port of Tacoma wharfage fees estimated at \$11.89 million a year. In addition, the Port will collect about \$8 million a year in land lease payments.

Partially supplied from the local economy are machinery, maintenance, and overhead costs, which total about \$64.5 million a year. Other large expenses that come from a mix of local and non-local sources include insurance, office expenses, administrative services, and sales costs.

Catalysts, absorbents, and other materials used to manufacture methanol are made primarily outside the local economy. There are some local impacts, however, because local wholesalers and shippers in the supply chain may be involved. The economic impact model estimates these local inputs and they contribute indirect impacts.

Vessel Calls

Based on the probable size of oceangoing vessels and the production volume at TMMEF, the Port of Tacoma will see an estimated 70 vessel calls a year. Each vessel call stimulates local spending.

ECONorthwest contacted the Port of Tacoma and Crowley Maritime for information on fees and expenditures from vessel calls. In total, because of vessel calls, in the local economy about \$2.1 million would be spent annually in Tacoma. This includes piloting services, tugs, marine fuel, and also spending by the crews and operators of visiting ships.

Spending from vessel calls is an indirect impact, which in turn stimulates additional indirect and induced spending in the local economy. All operating expenses also are initial indirect impacts. Subsequent indirect impacts occur when businesses more than one step removed from the plant are paid for goods and services. IMPLAN calculated these and they are included in the results, which follow.

Results of Economic Impact Analysis of Operations

Table 8 summarizes the total economic impacts anticipated annually from TMMEF on the nine-county local economy. Direct output is large (\$2.57 billion) because of the high value of the methanol to be produced in Tacoma and exported. Local indirect output, at \$62.0 million, is comparatively small since most of the inputs used for making methanol (primarily natural gas) originate outside of the region and the impact analysis only measures spending effects within the local counties.

Table 8: Annual Local Economic Impacts of TMMEF Operations

Impacts	Local Direct Impacts	Local Indirect Impacts	Local Induced Impacts	Total Local Impacts
Output (Mn. 2018 \$)	\$ 2,572.6	\$ 62.0	\$ 39.2	\$ 2,673.7
Labor Income (Mn. 2018 \$)	30.4	20.7	13.4	64.5
Employment (Job-Years)	260	480	267	1,007

The plant will directly employ 260. Indirect employment, which includes jobs tied directly to vessel calls and Port of Tacoma operations, are estimated to be 480. Induced job impacts from spending by jobholder households total 267, bringing the total annual economic impact on the CSA to 1,007 jobs.

Living Wage

The average job at the TMMEF will pay \$78,131 in wages, plus \$38,699 in benefits and payroll taxes for a total of \$116,830. The average wage is \$26,553 higher than the living wage for a family of four living in Pierce County.

Table 9: Compensation at TMMEF and Living Wages, 2018 \$

Income 2018 \$	Per TMMEF Worker
Per TMMEF employee:	
Wages & salaries	\$ 78,131
Benefits & payroll taxes	38,699
Total compensation	\$ 116,830
Living wage, Pierce Co.*	51,578
Median family income*	76,890
Average wage in county*	50,627

Sources: NWIG, US American Community Survey (2014), Massachusetts Institute of Technology living wage by county estimate (<http://livingwage.mit.edu/counties/53053>), US Bureau of Labor Statistics occupational wage survey May 2014.

* Values adjusted for inflation to 2018 \$ assume inflation of 6.4 percent between 2014 and 2018.

Fiscal Impacts

Having a \$3.6 billion plant in Tacoma will generate substantial fiscal impacts. As previously noted, the Port of Tacoma will receive about \$11.9 million in wharfage fees and \$8 million in land lease payments from TMMEF. The plant will pay millions more in taxes to state and local governments.

State and Local Tax Revenues

In this section, ECONorthwest estimates the taxes that would be paid by the plant. They are based on the construction costs and operations described in this report. Actual taxes may differ depending on the final construction costs for the facility and the level of its production. In addition, the ultimate tax levels are subject to changing tax rates and tax laws, which are unpredictable. Therefore, the figures provided here are approximate.

Business & Occupation Tax

Washington imposes a gross receipts tax on businesses, which is known as the business & occupation (B&O) tax. The tax rate is applied to the gross proceeds of sales or gross income. Rates vary by type of industry and there are some exemptions.

Construction B&O Tax

Construction companies pay a 0.471 percent B&O tax based on the value of construction less sales taxes. Professional engineering and architectural services are taxed at a 1.5 percent rate. ECONorthwest uses these rates in this analysis.

ECONorthwest applied the B&O tax rate of 0.471 percent on approximately \$3.37 billion of construction, which also includes equipment purchases, before sales taxes. The 1.50 percent B&O tax rate applies to approximately \$122.5 million in professional services. Thus, the total project, excluding sales tax, of \$3.49 billion will generate \$17.69 million in state B&O tax.

The City of Tacoma also imposes a B&O tax on construction, but at a lower rate than the state—0.153 percent. The City imposes a 0.4 percent B&O tax on professional services. The estimated city B&O tax would be \$5.64 million.

Operations B&O Tax

Washington will impose a B&O tax on methanol production. The basic tax rate that applies to methanol is 0.484 percent of wholesale value. There may be adjustments based on how much output is subject to the tax in any given year. ECONorthwest estimates the annual B&O tax will fall between \$9.7 million and \$12.5 million.

Tacoma's B&O tax rate on methanol production is 0.11 percent. The portion of output subject to the tax ranges from 80 to 100 percent. The City also provides for a \$500 credit for each permanent, fulltime, and family wage job. At the TMMEF, there would be 260 such jobs. As a result, NWIW would be allowed a \$130,000 job credit to help offset its City B&O tax obligation. Therefore, the annual City B&O tax will be between \$2,133,873 and \$2,699,841.

Sales & Use Tax

Washington imposes a 6.5 percent sales & use tax on construction. An additional 3.1 percent in city of Tacoma and other local government sales & use taxes applies at the location of the plant. The taxes apply to construction costs less manufacturing machinery and equipment, which are exempt. Non-construction services, such as architecture, are not subject to the retail sales tax either. Thus, the total sales and use tax from the construction of TMMEF would be about \$110.9 million. Of this \$75.1 million would be the state's portion and \$35.8 million would be the share for Tacoma and other local governments.

Once operating, the plant will pay sales and use taxes for supplies, fuel (natural gas consumed at the plant for energy), and maintenance services. There is no sales tax on natural gas that would be made into methanol nor is there sales tax on service. An estimated \$57.1 million in natural gas will be used as fuel annually at the plant and approximately \$117.4 million will be spent on other taxable purchases.

The state tax on fuel is 3.852 percent. The city tax on fuel is 7.5 percent. Sales and use taxes on other goods are 6.5 percent for the state and 3.1 percent for the city. ECONorthwest estimates annual sales and use taxes of \$7.9 million to the city and \$9.8 million for the state, for a total of \$17.7 million.

Leasehold and Hazardous Substance Taxes

TMMEF will lease land from the Port of Tacoma. TMMEF will pay a 12.84 percent leasehold excise tax in lieu of property tax. That tax would be about \$1.03 million a year. Approximately 53 percent of that tax goes to the state and 47 percent of the tax is returned to the county and city.

In addition, Washington imposes a 0.7 percent hazardous substance tax on the value of methanol production, which ECONorthwest estimates would be about \$2.57 billion in 2018. Thus, the tax would be approximately \$18 million a year.

Property Tax

Washington law requires county assessors to appraise industrial properties at 100 percent of their true and fair market value.¹⁰ Machinery and equipment affixed to real property is considered real property. If it is not affixed, it is counted as personal property. Initially, the value of an industrial property is its cost to build.

Assessors multiply the initial or historical cost by a percent good factor for chemical manufacturing plants. The factor declines as a plant ages, which is a reflection of depreciation. The state reports these factors in a table called “Combined Trended Investment Tables for Personal and Industrial Properties.” For this analysis ECONorthwest used the January 1, 2016 table from the Washington Department of Revenue.

Assessing real estate, particularly industrial property, is complex and beyond the scope of this analysis. However, for the purpose of estimating property tax on TMMEF, ECONorthwest uses the cost to construct as the historical cost. The assessor may determine a different value depending on what is included and excluded.

From the historical cost, the true and fair market value is calculated. It is the historical value times the percent good factor, which is provided annually by the Washington Department of Revenue.

The property analysis determined the property tax revenue “footprint” of the proposed plant based on the \$3.6 billion value of the plant to construct. Because the land will be leased from the Port of Tacoma, the property tax footprint includes just the improvement value of the project.

In Washington State property tax revenue increases are limited to one percent of the previous year’s levy. However, new construction is exempt from this limit in its first year. As a result, new construction value is an important way for local jurisdictions to increase their levy by more than one percent. For the TMMEF, the construction value of the plant is considered new construction value added to the local tax base. This additional value generates ongoing property taxes paid on improvement value, which decreases overtime based on the Washington Department of Revenue’s industrial trended investment table.

¹⁰ WAC 458-07-030

The analysis calculated the property tax revenue for all districts with a regular levy rate. Districts included in the analysis are:

- City of Tacoma
- City of Tacoma Emergency Medical Services
- Pierce County
- Washington State
- Port of Tacoma
- Tacoma Metropolitan Park District
- Flood Control Zone
- Conservation Futures

Districts with excess levies, by definition, do not collect more property taxes when new property comes on the roles. Excess levy districts get a predetermined amount levied each year. As a result, the project would not generate any new revenue for those taxing districts. However, because their predetermined revenues are spread over more property, the addition of the methanol plant reduces the property taxes for all other property owners.

Our analysis uses the most recent property tax rates (2015), estimated future rates based on allowable assessed value growth (one percent per year), and assumed amount of new construction value added each year. The Port of Tacoma is not subject to the one percent limit. We presumed their property tax rate remains unchanged.

In the first year after the plant was completed it would generate \$29.5 million in incremental property tax revenues for all districts. Due to the decreasing value of the improvement value, the total revenue generated ten years later would be an estimated \$14.5 million. Taxes paid are based on the fair market value times the mill levy rates (property tax rates).

Table 10: Total Incremental Property Tax Revenues Resulting From Development By Jurisdiction

	City	County	State	Other Districts	Total
Year 1	\$10,586,805	\$4,945,480	\$8,265,137	\$5,719,597	\$29,517,019
Year 10	\$5,101,752	\$2,383,213	\$3,982,947	\$3,008,508	\$14,476,421
Total NPV (2018\$)	\$59,363,100	\$27,730,600	\$46,344,900	\$33,202,300	\$166,640,900

Note: This analysis assumes 2015 levy rates apply to the methanol plant.

Table 11 shows how much districts with excess levies receive annually and the amounts that the TMMEF would pay towards them in property taxes. Those payments have no incremental impact on the total taxes collected because all other property owners would see their taxes to these districts decline dollar for dollar.

Table 11: Excess Levy Incremental Property Tax Revenue Share Paid by TMMEF by Jurisdiction

	City Bond	Metro Parks Bond	School District Bonds	Total
Annual Levy	\$2,789,240	\$18,872,000	\$144,818,519	\$166,479,759
Share Year 1	\$425,939	\$2,831,814	\$20,961,712	\$24,219,465
Share Year 10	\$167,633	\$1,114,493	\$8,249,723	\$9,531,850

Note: This analysis assumes 2015 levy rates apply to the methanol plant.

In other words, the amounts the districts receive for their bond levies will not change, but the methanol plant will pick up its share of the burden, thus, reducing how much others would have to pay. The size of the rate decreases for existing property owners varies by bond district, but averages about 15 percent in year one and 6 percent in year ten.

In total, TMMEF will pay \$53.7 million in property related taxes in its first year of operations. Of this, \$29.5 million would be incremental taxes (Table 10) benefitting state and local governments. The remainder, \$24.2 million, would go towards servicing city, park, and school bonds (Table 11), and, thus, reduce levies imposed on all other taxpayers.