

# THE IMPACT OF THE MILLSTONE NUCLEAR POWER PLANT ON CONNECTICUT'S ECONOMY:

A Dynamic Impact Analysis

By

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# **Executive Summary**

The Connecticut Center for Economic Analysis (CCEA) at the University of Connecticut coordinating with Clarke & Co. of Boston, Massachusetts performed a regional and statewide economic impact analysis of the current operations of Millstone Nuclear Power Plant located in the Town of Waterford in New London County. This analysis reports the salient effects resulting from direct and indirect employment, in-state procurement, electric power sales, and state and local taxes paid using the REMI model, a dynamic input-output model of Connecticut and its eight counties. We assume the primary market for Millstone is New London County. As such, New London County is singled out for separate analysis to capture the local impact. In addition to spillover effects from New London, Millstone has direct effects through its operations across Connecticut. As a result, this report considers Millstone's impact on the State as a whole. We separately consider its impact on Fairfield, New Haven and Hartford Counties.

We model the impact of Millstone as a *reduction or supply shock* in electricity sales to each County. The extent of the shock for each County is calculated by estimating the population-adjusted electricity sales for each County. We estimate the total annual electricity generation of Millstone for the year 2000 by taking twelve times the June 2000 electricity generation figure. In June 2000, the two nuclear power stations generated 1,353 million kilowatt-hours. This figure is a conservative estimate considering that production is highest in the summer peak months of July and August. The total estimated electricity generated by Millstone 2 and Millstone 3 multiplied by the average rate for generation services, estimated by Connecticut Light and Power, provides total sales. Using 4.813 cents per kilowatt-hour (exclusive of transmission, distribution, and decommissioning costs), we estimate that the total sales from electricity generation are about \$800 million for the year 2000. Millstone's 1999 statewide payroll was \$118 million; its 1999 Connecticut procurement totaled almost \$53 million, and Millstone employed 1,737 people. *Millstone's sales, procurement and employment drive the economic impact of its ongoing operations*.



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# Economic and Fiscal Impact of the Millstone Nuclear Power Plants Gross State Product and Personal Income

The key results reported are gross state product (GSP) and aggregate personal income. GSP is the dollar value of all final goods and services produced in the State in one year (GRP is the regional amount). GSP exceeds the REMI baseline forecast in each County and the State as a result of Millstone's operations. The largest county GRP impact in the State is in New London County in annual average terms. The average annual increases in GRP are \$486 million in New London County (5 %), \$163 million in Fairfield County (0.42 %), and \$201 million for Hartford County (0.53 %), compared to \$1,126 million for the State of Connecticut (0.9 %). All figures are shown in nominal dollars and average percent changes and are relative to the REMI forecast. Average annual additions to GRP are the annual gains in GRP over the baseline forecast averaged over the number of years of the scenario. The present value of GRP increases are \$2.16 billion, \$1.67 billion, \$1.77 billion, \$5.15 billion and \$12.05 billion in Hartford, New Haven, Fairfield, New London Counties and Connecticut, respectively, using a discount factor of 6.5% over the twenty-year horizon. Present value represents the total value today of a stream of future payments each discounted to the present. We conclude that these values represent substantial *positive* contributions to the Connecticut economy.

The largest impact on aggregate personal income in annual average and in present value terms is in New London County. Personal income increases by \$225.45 million in New London County (2.85 %), \$37.85 million in Fairfield County (0.08 %), \$40.45 million in Hartford County (0.13 %), \$23.55 million in New Haven County (0.09 %), and, in the State it increases by \$372.70 million (0.28 %), all in annual average terms expressed in nominal dollars. In present value terms, these nominal increases represent \$2.46 billion, \$417.83 million, \$445 million, \$262.95 million and \$4.09 billion in New London, Fairfield, Hartford and New Haven Counties and in the State, respectively.

## Employment and Population

In addition to GSP and personal income, Millstone creates significant employment in the Counties and the State as a whole, relative to the baseline forecast. Millstone's operations create 4,227 additional jobs on an annual average basis in



Connecticut (0.23%). Most of the employment increase occurs in New London County (2.14%), followed by Fairfield (0.09%), Hartford (0.09%) and New Haven Counties (0.05%) with annual average increases of 2,850; 434; 513 and 200 jobs, respectively.

The consequent increases in personal income and economic activity cause people to move to the State because of increased job opportunities. The change in the population in the State and in the Counties separately is significant compared to the REMI baseline forecast. In annual average terms, Connecticut gains 5,803 people (0.18 %) from the Millstone's operations. New London County, with the largest impact in all categories, gains 3,567 people (1.41 %) during the study period on average annually.

#### State and Local Taxes

The ongoing operations of Millstone create new tax revenue at the state and local levels. In our analysis we include the \$33 million property tax paid by Millstone to the Town of Waterford. Millstone's operations affect *induced* government spending. As people move to the State and there is more economic activity, the government spends more to maintain the level of public services, such as for education and police, than in the past. State tax revenue is dependent on general economic activity. The rise in GSP and personal income that accompanies the increase in expenditures made through Millstone's payroll and procurement, increases tax collections both in the County and the State. Total state taxes increase \$17.95 million from New London County, \$5.01 million from Fairfield County, \$6 million from Hartford County, \$4.43 million from New Haven, and \$37.58 million in Connecticut on average annually in nominal dollars. In present value terms, there is an increase of \$404.73 million in additional state taxes paid in Connecticut over the twenty-one year period as a result of Millstone's operations.

We calculate net state tax revenue (exclusive of local taxes) by subtracting induced government spending from total state tax revenue. Positive net state tax revenue means that because of Millstone's operations, the State has a net gain in tax revenue. In our case, the net state tax revenue is positive in all Counties and in the State as a whole. This means that Millstone's operations produce a net gain in tax revenues in Connecticut. Because Millstone generates more tax revenue than induced government spending statewide in such forms as education and police, net tax revenues in the State are positive.



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Net state tax revenues increase in the State as a whole by \$28.25 million (nominal) in annual average terms. This number corresponds to \$313.85 million (nominal) in present value terms for net state tax revenues in Connecticut. The largest increase in net state tax revenue is in New London County with \$15.4 million in annual average terms, and the net present value of the increase is \$168.46 million (both nominal).

Millstone's operation increases local taxes generated in the Counties and in the State as a whole, both in annual average and in present value terms. The local tax increase is highest in New London County, with \$7.84 million (nominal) in annual averages. This is an increase in addition to the \$33 million property tax Millstone pays to the Town of Waterford representing 66% of its 1999 property tax revenue and 58% of its 1999 total revenue. The present value of the increase over the study period is \$78.36 million (nominal).

Table 8 reproduced below provides a summary of Millstone's economic and fiscal impacts. Appendix I presents results for local property and state taxes for four counties and Connecticut. Appendix II presents summary tables of selected REMI results for four counties and Connecticut. Appendix III summarizes the REMI modeling strategy for the Millstone impact analysis.



Table 8: Summary Results for Millstone Nuclear Powerplant											
	Fai	Fairfield		Hartford Ne		New Haven		New London		Connecticut	
Variable	Average Annual Change	Present Value									
Private Non-Farm Employment	434	-	513	-	200	-	2850	-	4227	-	
Gross State Product (\$ Mil Nominal)	\$163.19	\$1,767.03	\$200.68	\$2,161.65	\$155.47	\$1,669.97	\$485.65	\$5,151.49	\$1,126.08	\$12,049.92	
Personal Income (\$ Mil Nominal)	\$37.85	\$417.83	\$40.45	\$445.00	\$23.55	\$262.95	\$225.45	\$2,457.25	\$372.70	\$4,085.07	
Disposable Income (\$ Mil Nominal)	\$30.45	\$334.06	\$31.86	\$348.04	\$18.42	\$204.14	\$178.76	\$1,934.92	\$295.01	\$3,211.12	
Population	461	-	605	-	369	-	3567	-	5803	-	
Total State Tax Revenue (\$ Mil Nominal)	\$5.01	\$54.46	\$6.00	\$64.83	\$4.43	\$47.90	\$17.95	\$192.22	\$37.58	\$404.73	
Total Local Tax Revenue (\$ Mil Nominal)	\$1.02	\$10.03	\$1.33	\$13.25	\$0.81	\$8.20	\$7.84	\$78.36	\$12.75	\$127.61	
Induced Gov't Spending (\$ Mil Nominal)	\$1.91	\$18.69	\$3.82	\$37.88	\$1.61	\$16.38	\$4.15	\$38.64	\$15.17	\$147.78	
Net State Tax Revenue (\$ Mil Nominal)	\$3.84	\$42.97	\$3.65	\$41.54	\$3.44	\$37.83	\$15.40	\$168.46	\$28.25	\$313.85	
Net Local Tax Revenue (\$ Mil Nominal)	\$0.29	\$2.83	(\$0.14)	(\$1.34)	\$0.19	\$1.89	\$6.24	\$63.49	\$6.91	\$70.71	



## Connecticut Energy Mix and Millstone Nuclear Plants

Considering the total electricity generation capability and the increasing demand for it in Connecticut, existing state capacity is not enough to meet demand. Therefore, Connecticut currently has to import electricity to meet its ever-increasing demand. According to the Connecticut Siting Council's (CSC) estimates, the increase in total peak demand between 1998 and 2018 will be about 20%. Moreover, according to CSC, the maximum state generation capacity to serve peak demand in 1999 was 6,268 MW, and the expected peak demand was 6,300 MW. Table 3 reproduced below clearly illustrates this point: Connecticut has to import electricity from neighboring states to meet its demand.

Та	Table 3: Connecticut Generation Capability in 1999									
Supply		Capacity (MW)								
	<b>Total Connecticut Generation (No Import)</b>	6,278								
	Excluding Millstone and Import	4,268								
	Transmission Import Capability	2,000								
	Maximum Capacity with Millstone and Import	8,278								
	Maximum Capacity w/out Millstone	6,268								
Demand										
	Expected Peak Demand	6,300								

Source: Connecticut Siting Council

At <u>http://www.state.ct.us//csc/paul/htmlrev/forcst99.htm</u>

As Table 3 indicates, Millstone is an important source of electricity in Connecticut. The absence of Millstone would likely generate two important impacts in addition to other economic impacts: (1) the State would have to import electricity using up to its maximum import capability, because the short-term replacement of a major electricity generator is difficult. Importing will increase the already high-electricity price (which is the fourth highest in the nation with an average 10.3 cents per kilowatt-hour) in Connecticut, thereby increasing the cost of doing business. Other things being equal, this would create disincentives for businesses to relocate to or expand in Connecticut, and (2) importing more from the neighboring states, as the CSC argues, will further deteriorate Connecticut's air quality. Importing additional electricity from states located west and south of Connecticut means that electricity generating plants in those states would likely



use more high-sulfur fuels and lead to increased migration of sulfur and nitrogen oxides into Connecticut. Therefore, CSC argues Connecticut should minimize electricity imported from other states.

To better understand the place of nuclear energy in Connecticut's economy, Chart 2 reproduced below presents the 1998 Connecticut Energy Mix. Chart 2 shows the fraction of potential electricity generation capacity in Connecticut including both Utility and Non-Utility sources.





As is clear from Chart 2, nuclear energy constitutes about one-third of Connecticut's energy mix in terms of electricity generation capability. Next are oil-fired plants, which become more costly in the face of increasing oil prices in 2001 and beyond. As oil prices increase, nuclear energy will be preferred due to the higher cost of operating oil-fired plants and the negative impact of the oil-and coal-fired plants on air quality.

Probably because of both cost and environmental considerations, as depicted in Chart 3 reproduced below, nuclear-power stations contributed about 45% of the electricity actually generated in Connecticut in June 2000. This shows how important Millstone is to the Connecticut economy and to our quality of life. According to Chart 3, even though oil-fired plants could contribute 44% of the Connecticut Energy mix (Chart 2), in June 2000, they accounted for only 23% of total electricity generation in Connecticut.



<sup>&</sup>quot;Review of the Connecticut Electric Utilities' 1999 Twenty-Year Forecasts of Loads and Resources" at http://www.state.ct.us/csc/paul/htmlrev/forcst99.htm





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# Introduction

The Connecticut Center for Economic Analysis (CCEA) at the University of Connecticut coordinating with Clarke & Co. of Boston, Massachusetts performed a regional and statewide economic impact analysis of the current operations of Millstone Nuclear Power Plant located in the Town of Waterford in New London County. This analysis reports the salient effects resulting from direct and indirect employment, in-state procurement, electric power provision, and state and local taxes paid. In this analysis, we counterfactually subtract Millstone's current operations from the state economy to determine its current impact on Connecticut, New London County, Hartford County, Fairfield County and New Haven County.

We use the REMI model, a dynamic input-output model of Connecticut and its eight counties. The REMI model forecasts the economy in its present form as a baseline. Because Millstone *already exists* in the baseline model, we *counterfactually* remove it from the State economy. Our results can then be interpreted conversely to show the positive impact of its continuing operations. The counterfactual approach answers the question, how much would Connecticut, New London, and three other major Counties' economies (Fairfield, Hartford and New Haven) suffer if Millstone's facilities and related services disappeared from Connecticut. This approach then tells us how much Millstone currently contributes to the State and its County economies.

In order to fully assess the impact of the operations of Millstone Nuclear Power Stations in Connecticut, we proceed in the following order: first, we lay out the methodology and assumptions governing our approach to the study of nuclear power plants in Connecticut. Second, we look at Connecticut's energy profile and the contribution of the Millstone Nuclear Plants to the Connecticut and the Town of Waterford economy. In this context, we briefly highlight the direct economic impact of Millstone aside from electricity generation. Third, we present the direct and indirect economic impacts of Millstone on the Connecticut's and major counties' economies by looking at detailed population changes, economic output and employment changes by sector and jobs by occupation. Finally, we present a detailed fiscal impact of Millstone's operations, as well as a general summary of our findings.



#### Methodology and Assumptions

## I. <u>Model</u>

For this analysis, we use the REMI model calibrated and updated annually by Regional Economic Models, Inc. of Amherst, MA. This model is a dynamic, multisector, regional economic model of Connecticut developed specifically for the Connecticut Center for Economic Analysis. This model provides detail on all eight counties in the State of Connecticut and any amalgamation of these counties. The REMI model includes all of the major inter-industry linkages among 466 private industries, which are aggregated into some 49 major industrial sectors. With the addition of farming and three public sectors (State & local government, civilian federal government, and military), there are a total of 53 sectors represented in the model for all eight counties.

At the heart of the model is the extensive modeling of sectoral input-output relationships for the states by the U.S. Department of Commerce. The REMI model creates a dynamic interface among the many sectors of the economy, which allows the economy to adjust and react just as the real economy would. In addition, there is a substantial demographic component to the model, which is able to track the inflow and outflow of population by demographic categories based on economic conditions. Detailed results from the model are available in Appendix II at the end of the report.

The REMI model forecasts the Connecticut economy in its present form as a baseline. We add or subtract any changes in the economy from that baseline forecast depending on the nature of the change. Because Millstone *already exists* in the baseline model, we estimate the most accurate measure of Millstone's impact by *counterfactually* removing Millstone from the economy. Intuitively, the results contained in this report measure the losses to the economy resulting from the absence of the Millstone Nuclear Power Plants. However, one can interpret these same results as the positive impact of Millstone's continuing operations by reversing the signs of the economic variables.

This analysis considers two main geographic regions. We assume the primary market for Millstone is New London County. As such, we single out New London County for separate analysis to capture the local impact. In addition to spillover effects from New London, Millstone has direct effects through operations around the State. This statewide reach provides a benefit across the State. As a result, this report also considers



Millstone's impact on the State as a whole. We consider its impact on three other counties.

# II. Assumptions

Due to the nature of the energy sector, we develop assumptions that best capture the impact of Millstone Nuclear Power Stations on Connecticut's economy. Even though local customers consume electricity produced in a local area, total generation is still considered a part of the overall generation capacity of the State, and it should be treated as such rather than an isolated local source.

Considering the nature of Millstone and the overall generating capacity of Connecticut as well as the difficulty in this sector to compensate the retiring or shutdown of a major power plant in the short run, we decided to model a *supply shock* in electricity sales to each County. The extent of the shock for each County is calculated by estimating the population-adjusted electricity sales for each County. Table 1 presents the calculations regarding the consumption share of each County.

Table 1: Assumptions Regading the Economic Impact Analysis										
Counties	Fraction Of Population (%)	Consumption (mWh)	Rate (c/kWh)	Electricity Sales (Million)						
Fairfield	26	4,256,159	4.813	\$205						
Hartford	25	4,204,569	4.813	\$202						
Litchfield	6	920,299	4.813	\$44						
Middlesex	5	761,686	4.813	\$37						
New Haven	24	4,028,426	4.813	\$194						
New London	8	1,247,562	4.813	\$60						
Tolland	4	669,274	4.813	\$32						
Windham	3	533,674	4.813	\$26						
Connecticut	100	16,621,650	4.813	\$800						

Source: Consumption amount is calculated from Energy Information Administration, Department of Energy at <u>http://www.eia.doe.gov</u>. Kilowatt-hour rate for generation services (kWh) is obtained from Connecticut Light and Power rate information files at Connecticut Utility Department at <u>http://www.cud.state.ct.us</u>.

Using population to measure the consumption share of each County, Fairfield, Hartford, New Haven, and New London are the primary counties benefiting from the operation of these plants. We estimate the total electricity generation of Millstone for the



year 2000 by taking the June 2000 electricity generation figure multiplied by 12 to get an annual estimated total output of electricity generated by the Millstone 2 and Millstone 3 power stations. In June 2000, these two nuclear power stations generated 1,353 million kilowatt-hours. This figure is a conservative estimate considering that production is highest in the summer peak months in July and August.

The total estimated electricity generated by Millstone 2 and Millstone 3 multiplied by the average rate for generation services, estimated by Connecticut Light and Power and filed at Connecticut Utility Department, provides total sales. The amount used for this calculation is 4.813 cents per kilowatt-hour (exclusive of transmission, distribution, and decommissioning costs). Consequently, we estimate that the total (gross) revenue of Millstone 2 and Millstone 3 from electricity generation services is about \$800 million for the year 2000.

#### Direct Economic Impact of Millstone 2 and Millstone 3 on The Connecticut Economy

As the Connecticut Siting Council aptly puts it, "by releasing no sulfur oxides, nitrogen oxides, or carbon dioxide, nuclear power essentially represents a zero-airemission generation source."<sup>1</sup> With the required safety measures and maintenance, nuclear energy is a clean alternative to other sources of electricity. The Millstone Nuclear Stations received the ISO 14001 certification for environmental excellence, which was the second station receiving this award among over 100 nuclear stations in the nation.<sup>2</sup> In terms of average operating expenses as mills per kilowatt-hour, nuclear plants, as presented in Chart 1, are less expensive than other plants, except hydroelectric.

<sup>&</sup>lt;sup>1</sup> Connecticut Siting Council, 1999, "Review of the Connecticut Electric Utilities' 1999 Twenty-Year Forecasts of Loads and Resources," at http://www.state.ct.us/csc/paul/htmlrev/forcst99.htm. <sup>2</sup> For more information, see <u>http://www.millstonestation.com/pressreleases/</u>





Source: http://www.energyonline.com/Restructuring/energydb/avgexp.html.

Besides these friendly environmental and direct sales effects, Millstone Power employs people, purchases goods and services and pays taxes to local authorities in order to maintain their operations. In 1999, Millstone paid \$33 million in property taxes to the Town of Waterford in New London County. This amount constitutes 66% of Waterford's property tax revenue and 58% of the Town's total revenue for the year ending June 1999.

Moreover, when we look at the employment figures, New London County benefits from the presence of the power stations considerably as the total payroll amounted to \$118 million in 1999. Employment by place of residence shows that the main beneficiaries of the nuclear stations' payroll are New London, Hartford and Middlesex Counties. As Table 2 indicates, local hiring constitutes an important impact of these stations on the Waterford's economy. We report only total payroll for Millstone employees irrespective of their place of residence.



Table 2: M	lillstone Nucle	ear Plants Dire	ect Spending	in 1999 in Con	necticut
	Procurement	Payroll	Property Tax		Employment
Counties	(Million)	(Million \$)	(Million)	Total (Milllion)	by Residence
Fairfield	\$0.841			\$0.841	2
Hartford	\$17.291			\$17.291	132
Litchfield	\$0.157			\$0.157	1
Middlesex	\$2.396			\$2.396	174
New Haven	\$5.147			\$5.147	49
New London	\$26.839	\$118.107	\$33.000	\$177.946	1312
Tolland	\$0.115			\$0.115	24
Windham	\$0.166			<b>\$0.166</b>	43
Connecticut	\$52.952	\$118.107	\$33.000	\$204.059	1737

In terms of procurement, New London County receives the lion's share with about \$27 million annually. Following this is Hartford County with \$17 million, New Haven County with \$5 million, and Middlesex County with \$2.5 million. As Millstone changes ownership, management has stated that there will be changes in its procurement pattern toward purchasing more from local vendors than from out-of-state vendors.

As Table 2 clearly indicates, Connecticut is the real beneficiary from Millstone's operations. Millstone's procurement, payroll, and property tax total about \$204 million. As we clearly lay out in the following sections, this is in addition to the production of \$800 million of clean electricity.

## Connecticut Energy Mix and Millstone Nuclear Plants

When we look at the total electricity generation capability and the increasing demand for it in Connecticut, existing state capacity is not enough to meet demand. Therefore, Connecticut currently has to import electricity to meet its ever-increasing demand. According to the Connecticut Siting Council's (CSC) estimates, the increase in total peak demand between 1998 and 2018 will be about 20%. Moreover, according to CSC, the maximum state generation capacity to serve peak demand in 1999 was 6,268 MW, and the expected peak demand was 6,300 MW. As Table 3 clearly illustrates this point, Connecticut has to import from neighboring states to meet its demand.



Та	Table 3: Connecticut Generation Capability in 1999									
Supply		Capacity (MW)								
	<b>Total Connecticut Generation (No Import)</b>	6,278								
	Excluding Millstone and Import	4,268								
	Transmission Import Capability	2,000								
	Maximum Capacity with Millstone and Import	8,278								
	Maximum Capacity w/out Millstone	6,268								
Demand										
	Expected Peak Demand	6,300								

Source: Connecticut Siting Council

At http://www.state.ct.us//csc/paul/htmlrev/forcst99.htm

As Table 3 indicates, the Millstone units are an important source of electricity in Connecticut. The absence of the Millstone Units would likely generate two important impacts in addition to other economic impacts: (1) the State would have to import electricity using up to its maximum import capability, because the short-term replacement of a major electricity generator is difficult. Importing will increase the already highelectricity price (which is the fourth highest in the nation with an average 10.3 cents per kilowatt-hour) in Connecticut, thereby increasing the cost of doing business. Other things being equal, this would create disincentives for businesses to relocate to or expand in Connecticut, and (2) importing more from the neighboring states, as the Connecticut Siting Council argues, will further deteriorate Connecticut's air quality. Importing more electricity from the states located west and south of Connecticut means that the plants in those states would likely use more high-sulfur fuels and lead to the increased migration of sulfur and nitrogen oxides into Connecticut. Therefore, CSC argues Connecticut should minimize the amount of electricity imported from other states.

To better understand the place of nuclear energy in Connecticut's economy, Chart 2 presents the Connecticut Energy Mix in 1998. Chart 2 shows the fraction of potential electricity generation capacity in the State including both Utility and Non-Utility sources.







As it is clear from Chart 2, nuclear energy constitutes about one-third of Connecticut's energy mix in terms of electricity generation capability (differs from actual use). Next are oil-fired plants, which might become more costly in the face of increasing oil prices in 1999 and 2000. As oil prices increase, nuclear energy will be preferred due to the higher cost of operating oil-fired plants and the negative impact of the oil-and coal-fired plants on air quality. Unfortunately, Connecticut does not have much potential to generate electricity from hydroelectric plants, which is both a low-cost way of generating electricity and environmentally sound (neglecting lost wildlife habitat and displaced people).

Probably because of both cost and environmental considerations, as depicted in Chart 3, in June 2000, nuclear-powered stations contributed about 45% of the electricity actually generated in Connecticut. This shows how important the Millstone Units are to the Connecticut economy and to the quality of life in Connecticut. According to Chart 3, even though oil-fired plants could contribute to 44% of the Connecticut Energy mix (Chart 2), in June 2000, they accounted for only 23% of total electricity generation in Connecticut.





Source: Energy Information Administration at http://www.eia.doe.gov/cneaf/electricity/emp/html.

Considering the importance of nuclear stations in the Connecticut energy market, in the context of recent restructuring efforts to open generation services to competition to reduce the cost of electricity, the next sections evaluate the *direct and indirect* impact of Millstone operations on the State economy as a whole, as well as on four selected County (Hartford, Fairfield, New Haven and New London) economies. First, our focus is on the impact of Millstone on output (the value of goods and services produced) and employment by sector, and employment by occupation. Then, we look at the issue from the fiscal point of view and analyze how Millstone affects tax-related variables over the forecast period of twenty-one years (2000-2020).



Millstone's Direct and Indirect Impact on Output by Sectors, and Employment by Sectors and Occupation Categories.

## **Output by Selected Sectors**

Electricity generation plants affect all aspects of the economy. However, nuclear power plants affect some sectors more than others by their operation because of their relation with certain industries as input providers to the power generation process. Moreover, some industries provide specialized professional services to nuclear power stations. Therefore, certain industries or sectors will be affected significantly when a nuclear station ceases to operate or, conversely, starts up. As Table 4 indicates, the major effect in terms of output (the value of goods and services produced) of the operation of a nuclear power station is on the Industrial Machinery, Public Utilities, Construction, Wholesale, Miscellaneous Professional Services and Miscellaneous Business Services sectors.



Table 4: Annual A	الالالالالالالالالالالالالالالالالا										
	Sectors (Million 92 \$)*										
Variable	Fairf	ïeld	Harti	ford	New Haven		New London		Connecticut		
	Baseline	Annual	Baseline	Annual	Baseline	Annual	Baseline	Annual	Baseline	Annual	
	Output in	Average	Output in	Average	Output in	Average	Output in	Average	Output in	Average	
	2000	Change	2000	Change	2000	Change	2000	Change	2000	Change	
Stone,Clay,Etc.	\$131	\$0.16	\$113	\$0.25	\$139	\$0.10	\$25	\$0.79	\$587	\$1.75	
Machine & Computer	\$2,370	\$7.17	\$3,752	\$15.11	\$1,572	\$5.79	\$271	-\$0.24	\$9,690	\$36.66	
Mining	\$35	\$0.01	\$18	\$0.37	\$16	\$0.08	\$3	\$0.09	\$88	\$0.69	
Construction	\$2,459	\$5.39	\$2,435	\$7.42	\$2,207	\$1.48	\$663	\$39.91	\$9,348	\$57.43	
Public Utilities	\$660	\$151.58	\$998	\$168.21	\$844	\$166.49	\$596	\$364.76	\$3,472	\$982.35	
Eating & Drinking	\$694	\$0.27	\$846	\$0.55	\$654	\$0.28	\$245	\$2.84	\$2,877	\$4.46	
Wholesale Trade	\$3,565	\$5.20	\$4,007	\$8.58	\$2,684	\$2.92	\$297	\$10.17	\$11,433	\$28.43	
Misc. Business Service	\$3,783	\$7.87	\$3,033	\$7.71	\$2,367	\$2.93	\$432	\$21.81	\$10,299	\$41.23	
Misc. Professional Ser	\$2,736	\$8.66	\$1,706	\$2.68	\$1,067	\$0.62	\$378	\$66.84	\$6,290	\$79.67	
Education	\$370	\$0.04	\$384	\$0.12	\$843	\$0.29	\$101	\$0.44	\$2,070	\$1.08	
*Annual Average Chang	ge Calculatio	ons are Bas	ed on the F	orecast Re	sults Betwe	en 2000 a	and 2020				



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In the first column under each county and Connecticut, the baseline forecast output (gross sales) level in selected sectors in the selected counties and Connecticut is presented to give an idea of the level of output in each sector due to the ongoing operations of the Millstone Nuclear Stations. We base the annual average change calculations on the result of our counterfactual simulation without Millstone for the years between 2000 and 2020. We calculate all values presented in the table in millions of 92 dollars. The annual average change reflects the cumulative changes from the baseline forecast divided by 21 and is positive reflecting Millstone's positive contribution to the State economy.

As expected, the sector in the economy with the largest impact in terms of output is Public Utilities. In annual average terms, this reflects a \$982.35 (28 %) million statewide increase in output. The numbers in parentheses reflect change with regard to the 2000 baseline forecast level. Similarly, the annual average increases in aggregate output are \$168 (17 %) million, \$167 (20 %) million, \$152 (23 %) million, and \$365 (61 %) million in Hartford, New Haven, Fairfield and New London Counties, respectively.

Miscellaneous Professional Services, Construction, Machine and Computer, Miscellaneous Business Services and Wholesale Trade are the second most impacted sectors with statewide average annual increases in output of \$80 (1.3 %) million, \$57 (0.6 %) million, \$37 (0.4 %) million, 41 (0.4 %) million and \$28 (0.3 %) million, respectively. New London County would be affected more than other counties in the aforementioned sectors. Regarded counterfactually, New London County experiences a contraction primarily in the Public Utilities sector. Following this sector are Miscellaneous Professional Services, Construction and Miscellaneous Business Services Sectors. The effect in output in other counties is not significant in all sectors, except in the Public Utilities sector where it is impacted significantly in all remaining counties (Hartford, New Haven and Fairfield).



# **Employment by Sector**

Table 5: Ani	Table 5: Annual Average Changes in Employment by Sector Relative to Baseline Forecast Employment Level										
				by Se	ector in 200	)0*					
Variable	Fairfi	eld	Hartford		New H	laven	New Lo	ndon	Connec	ticut	
	Baseline		Baseline		Baseline		Baseline				
	Employment	Annual	Employment	Annual	Employment	Annual	Employment	Annual	Baseline	Annual	
	Level in	Average	Level in	Average	Level in	Average	Level in	Average	Employment	Average	
	2000	Change	2000	Change	2000	Change	2000	Change	Level in 2000	Change	
Manufacturing**	68,476	17	77,749	49	61,432	30	20,874	-258	274,386	-134	
Mining	541	0	254	4	312	1	60	2	1,484	9	
Construction	26,262	53	25,668	71	23,665	15	7,043	383	100,335	555	
Trans./Public Uti	22,279	7	28,611	21	22,666	7	6,925	1053	88,903	1,094	
Fin/Ins/Real Est	57,615	27	78,799	32	32,272	11	6,466	34	195,351	117	
Retail Trade	83,919	28	93,647	63	77,513	29	25,430	386	331,201	562	
Wholesale Trade	26,232	30	32,880	57	22,251	20	2,693	71	91,923	189	
Services	215,420	270	204,674	211	186,042	86	61,955	1169	759,219	1,814	
Agri/For/Fish Se	7,791	2	5,032	3	3,667	1	1,833	11	23,022	21	
*Annual Average	Change Calc	ulations are	Based on the	Result of F	orecast Betwe	en 2000 and	2020.				
**Negative value	in New Londo	n County is	due to the inc	crease in co	ompetition for l	abor in New	London Count	y generated	I by the expansi	ion of the	

manufacturing sector as a result of Millstone.



As Table 5 indicates, in terms of the annual average increase in employment, the Service sector is affected more than other sectors in the Table. Again, to reiterate, the changes are average annual changes from the baseline forecast. The first column gives the level of employment in the selected sectors in each County and the State of Connecticut in the year 2000. One significant observation in Table 5 is that the annual average change in employment in the Manufacturing sector is negative in New London County and Connecticut, even though in New Haven, Hartford and Fairfield Counties, the impact is positive as a result of Millstone 2 and 3. This result is mainly due to the fact that Millstone leads an expansion in manufacturing industry and the competition for labor in New London County increases. Increasing demand in both durable and non-durable manufacturing as well as service and public utilities sectors generates labor shortages.

The average annual increase in employment due to Millstone Power Stations in the Transportation and Public Utilities sectors is about 1,094 (1.2 %) jobs in Connecticut. The same change is about 21 (0.07 %), 7 (0.03 %), 7 (0.03 %), and 1,053 (15 %) jobs in Hartford, New Haven, Fairfield and New London Counties, respectively. Considering the total number of jobs in these sectors in Connecticut in 2000, which is about 90,000, the average annual change of 1,094 jobs is a significant impact created by the Millstone Power Station. Moreover, employment in Construction, Retail Trade and Services are greatly affected by Millstone's operations.

An even greater impact is on employment in the Services sector, as this sector experiences an annual average change of 1,814 (0.2 %) jobs in Connecticut, of which 1,169 jobs are from New London County (1.9 %). Besides New London County, Fairfield and Hartford Counties experience an annual average increase of 270 (0.13 %) and 211 (0.1 %) jobs in Services sector, respectively.

When we counterfactually remove Millstone, electricity generation capability would be substantially reduced in Connecticut, and in turn, new investments and electricity import would increase the cost of electricity. Increasing electricity cost will translate into increasing relative cost of doing business in Connecticut, which will either force companies to relocate or introduce measures to increase productivity and perhaps,



reduce the number of employees to remain competitive in their respective sectors even as capital intensity should be reduced instead.

The average annual increase in employment is about 555 (0.6 %) jobs in the Construction sector in Connecticut as a whole. This is a substantial expansion in a crucial sector as it indicates an increase in the number of start-up activities throughout the State. Among the four counties, New London would be affected most with an annual average increase in employment in the Construction sector of 383 (5.4 %) jobs. Hartford, Fairfield and New Haven Counties follow with 71 (0.3 %), 53 (0.2 %) and 15 (0.06 %) jobs, respectively.

Retail Trade and Wholesale Trade in Connecticut experience an average annual increase in employment of 562 (0.17 %) and 189 (0.21 %) jobs, respectively. New London and Hartford Counties in the Wholesale Trade sector and New London County in the Retail Trade sector experience an annual average increase of 71 (2.6 %), 57 (0.17 5) and 386 (1.5 %) jobs, respectively. The average annual change in employment in the Wholesale Trade and Retail Trade sectors in Fairfield County is 30 (0.11 %) and 28 (0.03 %) jobs, respectively. Table 6 gives further detail about the employment level by analyzing the impact of the Millstone Nuclear Power Station on employment by occupation.

#### **Employment by Occupation Categories**

Table 6 presents the effect of Millstone Nuclear Power operations on selected occupational categories. The annual average change from the baseline model is given in the second column under each reported County and Connecticut. Table 6 makes it clear that Construction Trade is the most impacted occupational category in Connecticut with an annual average increase of 252 (0.5 %) jobs. Electrical Equipment Mechanics and Electric Installation and Repair ranks second in terms of annual average change with 73 (0.8 %) jobs gained, considering the baseline level of 9,590 jobs in these occupations in Connecticut in 2000. Engineering and Science Technicians, Engineers and Management Support as occupational categories experience an annual average increase of 124 (0.5 %), 137 (0.49 %) and 238 (0.35 %) jobs, respectively. Even though the annual average change looks small, the number of jobs in Electric Power Generator Operators and



Distributors increase significantly considering the size of this occupation category. The average annual increase in this category in Connecticut is 35 (6.6 %) jobs whose total size is about 534 jobs in 2000.

When we look at the changes in occupational categories across the counties, New London County gains more than do others considering the baseline levels of occupational categories in New London and the corresponding annual average changes in those categories.



# Table 6: Annual Average Changes in Employment by Occupation Relative to Baseline Forecast and Baseline Employment Level in 2000\*

Variable	Fairfie	eld	Hartford		New Haven		New London		Connecticut	
	Baseline	Annual	Baseline	Annual	Baseline	Annual	Baseline	Annual	Baseline	Annual
	Employment	Average	Employment	Average	Employment	Average	Employment	Average	Employment	Average
	Level in 2000	Change	Level in 2000	Change	Level in 2000	Change	Level in 2000	Change	Level in 2000	Change
Engineers	8,324	13	8,606	9	5,466	3	2,482	109	27,745	137
Physical scientists	1,246	3	919	1	833	0	316	23	3,617	27
Comput, math & oper res	7,558	15	8,139	13	5,144	5	1,417	76	24,653	112
Life scientists	781	1	645	1	665	0	248	8	2,601	10
Elec pwr gen plant oper/dis	98	0	158	0	127	0	95	34	534	35
Management support	20,765	26	22,588	20	13,603	7	4,025	178	68,298	238
Engin & scienc tech & tech	7,153	11	6,549	8	4,987	3	1,702	100	22,777	124
Electr equip mech, inst & r	2,413	2	2,905	4	2,671	1	681	65	9,590	73
Gas & petro plant & syst	109	0	51	0	38	0	16	4	230	4
Construction trades	12,554	22	12,896	30	11,153	7	3,733	179	48,407	252
*Annual Average Change C	alculation is Ba	sed on the I	Result of Foreca	st Between	2000 and 2020.					



When we make a size-of-occupation and change-in-occupation comparison across the counties, the annual average change in occupations in New London County is more sensitive to Millstone operations than the same occupational categories in New Haven, Hartford, and Fairfield. In the following section, we highlight changes in some of the important economic variables due to Millstone.

# Economic and Fiscal Impact of the Millstone Nuclear Power Plants Gross State Product and Personal Income

The key variables reported are gross state product (GSP) and aggregate personal income. GSP is the dollar value of all final goods and services produced in the State in one year. GSP is calculated using a value-added approach, in which the value added at each stage of the production process is aggregated to yield the final value. Intermediate goods are excluded from this calculation to avoid double counting. The dollar value of all final goods and services produced in a county is referred as Gross Regional Product (GRP). GSP is above the baseline forecast in each County and the State as a result of Millstone's operations. The largest County GRP impact in the State is in New London County in terms of annual averages. The average annual increases in GRP are \$486 million in New London County (5%), \$163 million in Fairfield County (0.42%), and \$201 million for Hartford County (0.53 %), compared to \$1,126 million for the State of Connecticut (0.9 %) (all figures in nominal dollars). The smallest impact is in New Haven County with an \$156 million increase in its GRP due to Millstone (0.55 %). Average annual additions to GRP are the annual gains in GRP over the baseline forecast averaged over the number of years of the scenario. The present value of GRP increases \$2.16 billion, \$1.67 billion, \$1.77 billion, \$5.15 billion and \$12.05 billion in Hartford, New Haven, Fairfield, New London Counties and Connecticut, respectively, using a discount factor of 6.5% over the twenty-year horizon. Present value represents the total value today of a stream of future payments each discounted to the present. We conclude that these values represent substantial *positive* contributions to the Connecticut economy.

Another important variable is the change in aggregate personal income of Connecticut residents due to ongoing operations of Millstone. The largest county impact on personal income in annual average and in present value terms is in New London



County. Personal income increases by \$225.45 million in New London County (2.85 %), \$37.85 million in Fairfield County (0.08 %), \$40.45 million in Hartford County (0.13 %), \$23.55 million in New Haven County (0.09 %), and, in the State it increases by \$372.70 million (0.28 %), all in annual average terms expressed in nominal dollars. In present value terms, these nominal increases represent \$2.46 billion, \$417.83 million, \$445 million, \$262.95 million and \$4.09 billion in New London, Fairfield, Hartford and New Haven Counties and in the State, respectively.

Chart 4 reports the changes in GSP and personal income for the selected Counties and for the State as a whole in present value terms.



## **Employment and Population**

In addition to GSP and personal income, Millstone creates a significant amount of employment in the Counties and the State as a whole, relative to the baseline forecast. Millstone's operations result in 4,227 additional jobs on an annual average basis in Connecticut (0.23 %). Most of the employment increase occurs in New London County



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(2.14 %), followed by Fairfield (0.09 %), Hartford (0.09 %) and New Haven Counties (0.05 %) with annual average increases of 2,850; 434; 513 and 200 jobs, respectively.

The consequent increases in personal income and economic activity cause some people to move to the State because of increased job opportunities. The change in the population in the State as a whole and in the Counties separately is significant compared to the baseline forecast. In annual averages, Connecticut gains 5,803 people (0.18 %) from Millstone's operations. New London County, with the largest impact in all categories, gains 3,567 people (1.41 %) during the study period on average annually. Among the counties, the smallest impact on population is in New Haven County with an annual average increase of 369 people (0.05 %). Fairfield (0.05 %) and Hartford Counties (0.07 %) experience an annual average increase of 461 and 605 people, respectively. Chart 5 gives the changes in population for the Counties and for the State in annual averages.



These four key economic variables in our analysis demonstrate the importance of Millstone not only to the regional economies, but also to the State as a whole. We conclude that Millstone makes a substantial economic contribution to the State of



Connecticut and its regional economies. The second part of our analysis examines the changes in State and local tax revenue associated with Millstone's operations in Connecticut.

#### State and Local Taxes

As explained above, the baseline forecast already incorporates the existence of Millstone, and we counterfactually remove it from the economy to determine its current impact on the economy. The loss would cause a decline in general economic activity. In particular, Gross State Product (GSP) and personal income would fall resulting in a decline in income, sales, use and profits taxes in the State. In addition, the decline of employment and population leads to a decrease in the value of local property and, thus, local property taxes. Conversely, continuing and expanding Millstone's activities in the State increase economic activity and all tax revenues. In our analysis we include the \$33 million property tax paid by Millstone in 1999 to the Town of Waterford.

In addition to these basic tax changes, Millstone's operations affect *induced* government spending. As people move to the State and there is more economic activity, the government spends more to maintain the level of public services, such as for education and police, than in the past. This adjustment occurs endogenously, that is, within the model based on current and projected levels of government spending and population change.

State tax revenue is dependent on general economic activity. The increase in GSP and personal income that accompanies the increase in expenditures made through Millstone's payroll and procurement increase tax collections through the channels discussed above both in the County and the State. Total State taxes increase \$17.95 million from New London County, \$5.01 million from Fairfield County, \$6 million from Hartford County, \$4.43 million from New Haven, and \$37.58 million in Connecticut on average annually in nominal dollars. In present value terms, there is an increase of \$404.73 million in additional state taxes paid in Connecticut over the twenty-one year period as a result of Millstone's operations in the State.

As individuals move to the State, induced government spending increases. Induced government spending increases by \$15.17 million (nominal) in annual average



terms statewide. In present value terms, the change in induced government spending is \$147.78 million (nominal) in the State over the study period. Among the Counties, the largest impact on induced government spending is in New London County. Induced government spending increases by \$4.15 million (nominal) in annual average terms, and the change is \$38.64 million (nominal) in present value terms in New London County.

The more important fiscal impact variable is the change in net taxes. Net state tax revenue (exclusive of local taxes) is calculated by subtracting the state contribution to Millstone, (which we assume is zero) and induced government spending from total state tax revenue. Positive net state tax revenue means that because of Millstone's operations, the State has a net gain in tax revenue. In our case, the net state tax revenue is positive in all Counties and in the State as a whole. This means that Millstone's operations produce a net gain in tax revenues in the State as a whole. It is because Millstone generates more tax revenue than induced government spending statewide in such forms as education and police that net tax revenues in the State are positive.

Net state tax revenues increase in the State as a whole by \$28.25 million (nominal) in annual average terms. This number corresponds to \$313.85 million (nominal) in present value terms for net state tax revenues in Connecticut. The largest increase in net state tax revenue is in New London County with \$15.4 million in annual average terms, and the net present value of the increase is \$168.46 million(both nominal). Net state tax revenue increases least in New Haven County by \$3.44 million in annual average terms. This number corresponds to a \$37.83 million in net state tax revenues in present value terms. Chart 6 gives the changes in total and net state tax revenue in present value terms for the State as a whole and for each County separately.





Millstone's operations increase local taxes generated in the Counties and in the State as a whole, both in annual average and in present value terms. The local tax increase is highest in New London County, with \$7.84 million (nominal) in annual averages. This is an increase in addition to \$33 million property tax Millstone pays to the Town of Waterford. The present value of the increase over the study period is \$78.36 million (nominal). The smallest impact on local taxes is in New Haven County. Local tax revenue in New Haven County increases by \$0.81 million (nominal) in annual average terms. The overall increase in local tax revenue for the whole State is \$12.75 million (nominal) in annual average terms. The present value of the increase in local tax revenue over the study period is \$127.61 million (nominal) for the entire State.

After we subtract induced government spending, the Town of Waterford, each County and the State have a net gain in local tax revenues, whereas net local tax revenues generated in Hartford County show annual average decreases. This is due to the excess of induced government spending over tax revenues calculated in that County. The net local tax revenues in Hartford County decrease by \$0.14 million (nominal) in annual average terms. The present value of the decrease is \$1.34 million (nominal). Connecticut as a whole experiences an annual average increase in net local tax revenues of \$6.91 million (nominal), which corresponds to the present value of \$70.71 million



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(nominal). Chart 7 shows these gross and net new local tax revenues in the State and each County.



## Benefit and Cost Metrics

As with any large economic activity there are costs and benefits. The chief benefits of Millstone's ongoing operations are the increased employment and personal income, as well as its contribution through many channels to gross state product. Millstone's operations require that the State and local municipalities spend money for public services such as police and education to support these operations and all of their consequent economic activity. The tax revenues generated from these primary and secondary activities should (and do) more than offset the expenditures. To measure the benefit to cost ratio we calculate three metrics that ostensibly capture the benefit/cost concept. Because personal income, gross state product, induced government spending and tax revenues vary over time (the study period is twenty years), we calculate the present value of these variables for the ratios. Table 7 presents the ratios regarding the State of Connecticut's and four selected Counties' gain due to Millstone. The first takes into account the present value of Gross State Product and Gross Regional Product in each



County and induced government spending due to Millstone Nuclear Power. Results indicate that due to Millstone's ongoing operations, in New London County, for each dollar of state and local government spending, Connecticut gains \$133 in GSP. In other counties and Connecticut, the impact is similar but less than in New London. In Fairfield County, for each dollar of government spending, the State gains \$95 in GSP.

Table 7: Benefit/Cost Analysis of The Removal of Millstone PowerStations from Baseline Economy									
Benefit/Cost Metrics	Fairfield	Hartford	New Haven	New London	Connecticut				
Gross State Product (Mil \$) / Induced Gov't Spending (\$ Mil)	95	57	102	133	82				
Personal Income (\$ Mil) / Induced Gov't Spending (\$ Mil)	22	12	16	64	28				
Total Taxes (\$ Mil)/ Induced Gov't Spending (\$ Mil)	3	2	3	7	4				

In New Haven County, for each dollar of state and local government spending, the State's gain is \$102; in Hartford County, \$57; and in Connecticut, \$82. These calculations are based on the assumption and forecast results that from Millstone's operation, the State benefits by supporting the variety of economic activity created by Millstone's operations.

The second ratio in Table 7 takes into account aggregate personal income and induced government spending both in present value terms. In this case, even though the ratio is smaller than the previous one, it is still significant. In New London County, the increase in aggregate personal income will be \$64 for each dollar of induced government spending. In Fairfield and New Haven Counties, the ratios are 22 and 16, which means that the increases in personal income are \$22 and \$16 for each dollar of induced government spending, respectively. The ratios in Connecticut and Hartford County are 28 and 12, indicating that the increases in personal income in the State and Hartford County are \$28 and \$12 for each dollar of induced government, respectively. In other words, Millstone operations imply that each additional dollar of public spending leverages from 12 to 64 additional dollars in personal income, and from 57 to 133 additional dollars of GSP (GRP).



The third ratio in Table 7 looks at total taxes (both local and state) and induced government spending both in present value terms. In Fairfield and New Haven Counties, total revenue from taxes is three times more than induced government spending. The lowest ratio is in Hartford County and the highest in New London County with 2 and 7, respectively. In Connecticut, the ratio is 4, indicating that total revenue from taxes is four times more than induced government spending in Connecticut due to Millstone.

A summary of our findings with regard to the Millstone's economic and fiscal impacts is given in Table 8. Appendix I presents results for local property and state taxes for four counties and the State. Appendix II presents summary tables of selected REMI output for four counties and the State of Connecticut. Appendix III summarizes the modeling strategy for REMI for Millstone.



Table 8: Summary Results for Millstone Nuclear Powerplant											
	Fair	field	Hartford		New Haven		New London		Connecticut		
	Average		Average		Average		Average		Average		
	Annual	Present	Annual	Present	Annual	Present	Annual	Present	Annual	Present	
Variable	Change	Value	Change	Value	Change	Value	Change	Value	Change	Value	
Private Non-Farm Employment	434	-	513	-	200	-	2850	-	4227	-	
Gross State Product (\$ Mil Nominal)	\$163.19	\$1,767.03	\$200.68	\$2,161.65	\$155.47	\$1,669.97	\$485.65	\$5,151.49	\$1,126.08	\$12,049.92	
Personal Income (\$ Mil Nominal)	\$37.85	\$417.83	\$40.45	\$445.00	\$23.55	\$262.95	\$225.45	\$2,457.25	\$372.70	\$4,085.07	
Disposable Income (\$ Mil Nominal)	\$30.45	\$334.06	\$31.86	\$348.04	\$18.42	\$204.14	\$178.76	\$1,934.92	\$295.01	\$3,211.12	
Population	461	-	605	-	369	-	3567	-	5803	-	
Total State Tax Revenue (\$ Mil Nominal)	\$5.01	\$54.46	\$6.00	\$64.83	\$4.43	\$47.90	\$17.95	\$192.22	\$37.58	\$404.73	
Total Local Tax Revenue (\$ Mil Nominal)	\$1.02	\$10.03	\$1.33	\$13.25	\$0.81	\$8.20	\$7.84	\$78.36	\$12.75	\$127.61	
Induced Gov't Spending (\$ Mil Nominal)	\$1.91	\$18.69	\$3.82	\$37.88	\$1.61	\$16.38	\$4.15	\$38.64	\$15.17	\$147.78	
Net State Tax Revenue (\$ Mil Nominal)	\$3.84	\$42.97	\$3.65	\$41.54	\$3.44	\$37.83	\$15.40	\$168.46	\$28.25	\$313.85	
Net Local Tax Revenue (\$ Mil Nominal)	\$0.29	\$2.83	(\$0.14)	(\$1.34)	\$0.19	\$1.89	\$6.24	\$63.49	\$6.91	\$70.71	



Appendix I: TAX TABLES



Millstone Nuclear-Fairfie	ld County	/																			
(Millions of Dollars)	2000	2001	12002	~2003	112004		2006		C 2008	2009	<del>2</del> 010		-2012	2013	2014	2015	2016	2017	2018	2019	2020
Income Taxes			WIILL	STOP	VE NU	CLEAR POWER	( SIA	HON	5 AN	) COI	NNEC	neu	I EC	JNON	11						
Personal Income	38.6	38.9	38.0	36.7	35.3	34.1	33.3	33.0	32.9	33.2	33.8	34.6	35.6	36.8	38.1	39.5	41.0	42.7	44.4	46.2	48.1
Income Tax	1.0	1.1	1.0	1.0	1.0	0.9	0.9	0.9	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.1	1.1	1.2	1.2	1.2	1.3
Sales and Use Taxes																					
Gross State Product	144.8	144.0	143.4	143.1	143.5	144.4	146.3	148.1	150.4	153.3	156.6	160.3	164.2	168.4	172.9	177.7	182.5	187.7	192.9	198.4	203.9
Sales and UseTaxes	2.9	2.9	2.9	2.9	2.9	2.9	2.9	3.0	3.0	3.1	3.1	3.2	3.3	3.4	3.5	3.6	3.7	3.8	3.9	4.0	4.1
Corporate Profits Taxes																					
Gross State Product	144.8	144.0	143.4	143.1	143.5	144.4	146.3	148.1	150.4	153.3	156.6	160.3	164.2	168.4	172.9	177.7	182.5	187.7	192.9	198.4	203.9
Profits tax	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.9	0.9	0.9
Local Property Taxes																					
Project Directly	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Population	116.7	248.7	321.7	374.0	414.2	443.2	463.7	479.5	492.6	502.1	510.0	516.8	522.5	527.3	531.4	534.5	536.7	537.9	538.9	537.9	537.4
Total Property Taxes	0.2	0.4	0.5	0.6	0.7	0.8	0.9	0.9	1.0	1.0	1.1	1.1	1.2	1.2	1.3	1.3	1.4	1.4	1.4	1.5	1.5
TOTAL TAXES	4.8	5.0	5.1	5.1	5.2	5.3	5.3	5.4	5.5	5.7	5.8	6.0	6.1	6.3	6.5	6.7	6.9	7.1	7.4	7.6	7.8
TAX CREDITS/STATE																-				-	
CONTRIBUTIONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TAX CREDITS/LOCAL																					
CONTRIBUTIONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INDUCED																					
GOVERNMENT																					
SPENDING	0.3	0.7	1.0	1.2	1.4	1.5	1.6	1.7	1.8	1.9	2.0	2.1	2.2	2.3	2.4	2.5	2.5	2.6	2.7	2.7	2.8
NET TAXES	4.4	4.2	4.1	3.9	3.8	3.8	3.7	3.7	3.7	3.7	3.8	3.9	3.9	4.0	4.1	4.3	4.4	4.5	4.7	4.8	5.0
PRESENT VALUE OF																					
TOTAL TAXES	\$64.48																				
PRESENT VALUE OF																					
TOTAL STATE																					
TAXES	\$54.46																				
PRESENT VALUE OF																					
TOTAL LOCAL																					
TAXES	\$10.03																				
PRESENT VALUE OF																					
TAX																					
CREDITS/INDUCED																					
SPENDING	\$18.69																				
						*Induced spending															
						allocated															
						according to															
						relative shares of															
PRESENT VALUE OF	<b>.</b>					spending.															
NET TAXES*	\$45.80																				
PRESENT VALUE OF	¢ 40.07																				
DESENT VALUE OF	\$4Z.97																				
PRESENT VALUE OF	<b>#0.00</b>																				
INET LOCAL TAXES	\$2.83																				



Millstone Nuclear-Hartford County																					
(Millions of Dollars)																					
	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Income Taxes																					
Personal Income	38.6	40.3	40.2	39.3	38.0	36.8	35.9	35.6	35.6	35.9	36.5	37.4	38.4	39.6	41.0	42.5	44.0	45.7	47.5	49.3	51.2
Income Tax	1.0	1.1	1.1	1.1	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.1	1.1	1.1	1.2	1.2	1.3	1.3	1.4
Sales and Use Taxes																					
Gross State Product	169.8	171.2	172.3	173.3	174.9	176.9	179.6	182.4	185.7	189.5	193.8	198.6	203.6	208.9	214.5	220.4	226.7	233.1	239.5	246.3	253.2
Sales and UseTaxes	3.4	3.4	3.4	3.5	3.5	3.5	3.6	3.6	3.7	3.8	3.9	4.0	4.1	4.2	4.3	4.4	4.5	4.7	4.8	4.9	5.1
Corporate Profits Taxes																					
Gross State Product	169.8	171.2	172.3	173.3	174.9	176.9	179.6	182.4	185.7	189.5	193.8	198.6	203.6	208.9	214.5	220.4	226.7	233.1	239.5	246.3	253.2
Profits tax	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1	1.1
Local Property Taxes																					
Project Directly	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Population	166.8	353.4	457.5	531.7	581.5	612.9	631.2	644.5	653.4	659.9	664.2	668.7	672.4	674.9	676.8	677.8	677.2	675.8	673.6	671.3	669.1
Total Property Taxes	0.3	0.6	0.8	0.9	1.0	1.1	1.2	1.2	1.3	1.4	1.4	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.9	1.9
TOTAL TAXES	5.5	5.8	6.1	6.2	6.3	6.4	6.5	6.7	6.8	7.0	7.1	7.3	7.5	7.7	8.0	8.2	8.4	8.7	8.9	9.2	9.5
TAX CREDITS/STATE																					
CONTRIBUTIONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TAX CREDITS/LOCAL																					
CONTRIBUTIONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INDUCED GOVERNMENT																					
SPENDING	0.7	1.6	2.1	2.6	2.9	3.2	3.4	3.6	3.8	3.9	4.1	4.2	4.4	4.5	4.7	4.8	4.9	5.0	5.2	5.3	5.4
NET TAXES	4.7	4.3	3.9	3.6	3.4	3.2	3.1	3.1	3.0	3.0	3.1	3.1	3.2	3.2	3.3	3.4	3.5	3.6	3.8	3.9	4.1
PRESENT VALUE OF TOTAL TAXES	\$78.08																				
PRESENT VALUE OF TOTAL STATE																					
TAXES	\$64.83																				
PRESENT VALUE OF TOTAL LOCAL																					
TAXES	\$13.25																				
						*Induced															
						spending															
PRESENT VALUE OF TAX						allocated															
CREDITS/INDUCED SPENDING						according to															
						relative shares															
	\$37.88					of spending.															
PRESENT VALUE OF NET TAXES*	\$40.20					g.															
PRESENT VALUE OF NET STATE																					
TAXES*	\$41.54																				
PRESENT VALUE OF NET LOCAL																					
TAXES	(\$1.34)																				



Millstone Nuclear-New			MIL	LSTO	NE N	UCLEAR POWER	STAT	IONS	AND	CON	NEC	LICU.	Г ЕСС	NOM	ÍY						
Haven County																					
(Millions of Dollars)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Income Taxes																					
Personal Income	25.4	25.8	25.1	24.0	22.8	21.6	20.7	20.3	20.1	20.2	20.5	21.0	21.6	22.3	23.2	24.1	25.0	26.1	27.1	28.3	29.5
Income Tax	0.7	0.7	0.7	0.6	0.6	0.6	0.6	0.5	0.5	0.5	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.8	0.8
Sales and Use Taxes																					
Gross State Product	127.1	128.9	130.7	132.5	134.6	137.2	140.2	142.7	145.5	148.6	152.0	155.7	159.4	163.5	167.5	171.8	176.2	180.7	185.2	190.1	195.0
Sales and UseTaxes	2.5	2.6	2.6	2.6	2.7	2.7	2.8	2.9	2.9	3.0	3.0	3.1	3.2	3.3	3.3	3.4	3.5	3.6	3.7	3.8	3.9
Corporate Profits Taxes																					
Gross State Product	127.1	128.9	130.7	132.5	134.6	137.2	140.2	142.7	145.5	148.6	152.0	155.7	159.4	163.5	167.5	171.8	176.2	180.7	185.2	190.1	195.0
Profits tax	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.6	0.7	0.7	0.7	0.7	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9
Local Property Taxes																					
Project Directly	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Population	121.0	252.1	317.4	360.7	386.0	399.2	404.4	405.7	404.7	402.6	400.5	398.3	396.7	395.0	393.2	391.5	389.4	387.6	385.6	384.2	383.2
Total Property Taxes	0.2	0.4	0.5	0.6	0.7	0.7	0.8	0.8	0.8	0.8	0.8	0.9	0.9	0.9	0.9	1.0	1.0	1.0	1.0	1.1	1.1
TOTAL TAXES	4.0	4.3	4.4	4.5	4.6	4.7	4.7	4.8	4.9	5.0	5.1	5.2	5.4	5.5	5.7	5.8	6.0	6.1	6.3	6.5	6.6
TAX CREDITS/STATE																					
CONTRIBUTIONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TAX CREDITS/LOCAL																					
CONTRIBUTIONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INDUCED																					
GOVERNMENT																					
SPENDING	0.4	0.8	1.0	1.2	1.4	1.5	1.5	1.6	1.6	1.7	1.7	1.8	1.8	1.8	1.9	1.9	2.0	2.0	2.1	2.1	2.2
NET TAXES	3.6																				
PRESENT VALUE OF																					
TOTAL TAXES	\$56.10																				
PRESENT VALUE OF																					
TOTAL STATE TAXES	\$47.90																				
						*Induced spending															
PRESENT VALUE OF						allocated according to															
TOTAL LOCAL TAXES						relative shares of															
	\$8.20					spending.															
PRESENT VALUE OF																					
TAX CREDITS/INDUCED																					
SPENDING	\$16.38																				
PRESENT VALUE OF																					
NET TAXES*	\$3.40																				
PRESENT VALUE OF																					
NET STATE TAXES*	\$37.83																				
PRESENT VALUE OF																					
NET LOCAL TAXES	\$1.89																				



Millstone Nuclear- New																					
(Millions of Dollars)	2000	2001	2002	2002	2004	2005	2006	2007	2009	2000	2010	2011	2012	2012	2014	2015	2016	2017	2019	2010	2020
	2000	2001	2002	2003	2004	2005	2000	2007	2008	2009	2010	2011	2012	2013	2014	2015	2010	2017	2010	2019	2020
Porsonal Incomo	107.8	205.0	207.2	207.2	206.3	205.1	204.6	205.0	207.0	210.8	214.4	218.0	223 5	228.8	234.6	240.0	247.5	254.8	262.4	270.7	270.2
	197.0	205.9	201.2	207.2	200.3	203.1	204.0	203.9	207.9	210.0	Z 14.4	210.9	223.3	220.0	234.0	240.9	247.5	204.0	202.4	210.1	219.2
Salos and Liso Taxos	5.5	5.0	5.0	5.0	5.0	5.5	5.5	5.0	5.0	5.7	5.0	5.5	0.0	0.2	0.3	0.5	0.7	0.9	1.1	1.5	1.5
Gross State Product	402.6	402.2	300 4	308.0	400.2	403.9	410.6	419.0	429 3	441 4	455.2	470 7	487.8	506.3	526.4	547 8	569.8	593.8	617.9	644.4	670.9
Sales and LiseTaxes	402.0	8.0	8.0	8.0	8.0	8 1	8.2	8.4	8.6	8.8		9.4	9.70F	10.1	10.5	11.0	11.4	11 9	12.4	12 9	13.4
Corporato Profite Taxos	0.1	0.0	0.0	0.0	0.0	0.1	0.2	0.4	0.0	0.0	5.1	5.4	5.0	10.1	10.0	11.0	11.4	11.5	12.7	12.5	10.4
Gross State Product	402.6	402.2	300 4	308.0	400.2	403.0	410.6	410.0	120.3	111 1	155.2	470.7	197.9	506.3	526.4	547.8	560.8	503.8	617.0	644.4	670.0
Profite tax	402.0	402.2	399.4	396.9	400.2	403.9	410.0	419.0	429.3	20	400.2	4/0./	407.0	2 2 2	2 3	2.4	2.5	2.6	27	2 0	3.0
	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.3	1.3	2.0	2.0	2.1	2.2	2.2	2.5	2.4	2.5	2.0	2.1	2.3	5.0
Local Property Taxes																					
Project Directly Bopulation	1029.0	2170.0	2694.0	2095 0	2200.0	2602.0	2752.0	2960.0	2026.0	2000 0	4022.0	4042.0	1019.0	4020.0	4010.0	2000 0	2047.0	2000.0	2950.0	2901.0	2755.0
Total Broparty Taxoa	1030.0	2170.0	2004.0	5065.0	5390.0	5002.0	3752.0	7.5	3930.0	3900.0	4022.0	4042.0	4046.0	4039.0	4019.0	3900.0	3947.0	10.1	10.2	10.5	10.7
	16.9	10.0	4.0	20.6	21.4	22.0	22.6	7.5	22.0	0.2	25.4	26.0	9.1	9.3	9.0	9.0	20.6	21.5	22.5	22.5	24.6
	10.0	10.9	19.0	20.0	21.4	22.0	22.0	23.3	23.9	24.7	20.4	20.2	27.0	27.9	20.0	29.1	30.0	31.0	32.5	33.0	34.0
CONTRIBUTIONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TAX CREDITS/LOCAL																					
CONTRIBUTIONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INDUCED																					
GOVERNMENT																					
SPENDING	-0.204	0.70	1.38	1.97	2.49	2.94	3.31	3.67	4.00	4.31	4.59	4.85	5.08	5.32	5.53	5.73	5.93	6.14	6.32	6.49	6.66
NET TAXES	17.0	18.2	18.5	18.7	18.9	19.0	19.3	19.6	19.9	20.4	20.8	21.4	22.0	22.6	23.2	23.9	24.6	25.4	26.2	27.0	27.9
PRESENT VALUE OF																					
TOTAL TAXES	\$270.58																				
PRESENT VALUE OF																					
TOTAL STATE TAXES	\$192.22																				
PRESENT VALUE OF																					
TOTAL LOCAL TAXES	\$78.36																				
PRESENT VALUE OF																					
TAX CREDITS/INDUCED																					
SPENDING	\$38.64																				
PRESENT VALUE OF																					
NET TAXES*	\$231.94																				
PRESENT VALUE OF																					
NET STATE TAXES*	\$168.46																				
PRESENT VALUE OF																					
NET LOCAL TAXES	\$63.49																			. I	



Millstone Nuclear- Connecticut																					
(Millions of Dollars)	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019	2020
Income Taxes																					
Personal Income	344.0	356.6	356.1	351.8	345.8	339.9	335.6	335.6	337.3	341.1	346.6	354.1	362.3	371.8	382.6	394.0	406.1	419.6	433.4	448.5	464.0
Income Tax	9.3	9.6	9.6	9.5	9.3	9.2	9.1	9.1	9.1	9.2	9.4	9.6	9.8	10.0	10.3	10.6	11.0	11.3	11.7	12.1	12.5
Sales and Use Taxes																					
Gross State Product	943.1	947.1	947.5	951.0	957.7	968.6	984.9	1002.5	1023.8	1048.4	1075.9	1106.4	1139.3	1174.6	1212.2	1252.0	1292.5	1336.5	1380.6	1427.8	1475.4
Sales and UseTaxes	18.9	18.9	19.0	19.0	19.2	19.4	19.7	20.1	20.5	21.0	21.5	22.1	22.8	23.5	24.2	25.0	25.9	26.7	27.6	28.6	29.5
Corporate Profits Taxes																					
Gross State Product	943.1	947.1	947.5	951.0	957.7	968.6	984.9	1002.5	1023.8	1048.4	1075.9	1106.4	1139.3	1174.6	1212.2	1252.0	1292.5	1336.5	1380.6	1427.8	1475.4
Profits tax	4.2	4.2	4.2	4.2	4.2	4.3	4.4	4.4	4.5	4.6	4.8	4.9	5.1	5.2	5.4	5.6	5.7	5.9	6.1	6.3	6.5
Local Property Taxes																					
Project Directly																					
Population	1691.0	3547.0	4450.0	5122.0	5606.0	5929.0	6141.0	6287.0	6385.0	6449.0	6489.0	6512.0	6519.0	6508.0	6482.0	6442.0	6389.0	6326.0	6261.0	6198.0	6140.0
Total Property Taxes	2.7	5.7	7.4	8.8	9.9	10.8	11.5	12.2	12.7	13.2	13.7	14.2	14.6	15.0	15.4	15.8	16.1	16.4	16.8	17.1	17.4
TOTAL TAXES	35.0	38.5	40.2	41.5	42.7	43.7	44.7	45.7	46.8	48.1	49.4	50.8	52.2	53.8	55.4	57.0	58.7	60.4	62.2	64.1	66.0
TAX CREDITS/STATE																					
CONTRIBUTIONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
TAX CREDITS/LOCAL																					
CONTRIBUTIONS	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0
INDUCED																					
GOVERNMENT	1.19	4.96	7.40	9.39	10.99	12.29	13.34	14.25	15.08	15.83	16.54	17.20	17.84	18.45	19.01	19.56	20.07	20.57	21.06	21.56	22.04
SPENDING																					
NET TAXES	33.8	33.6	32.8	32.2	31.7	31.4	31.3	31.5	31.8	32.2	32.8	33.6	34.4	35.3	36.4	37.5	38.6	39.9	41.1	42.5	44.0
PRESENT VALUE OF																					
TOTAL TAXES	532.3																				
PRESENT VALUE OF																					
TOTAL STATE TAXES	\$404.73																				
PRESENT VALUE OF																					
TOTAL LOCAL TAXES	\$127.61																				
PRESENT VALUE OF TAX CREDITS/INDUCED SPENDING	\$147.78																				
PRESENT VALUE OF																					
NET TAXES*	\$384.56																				
PRESENT VALUE OF																					
NET STATE TAXES*	\$313.85																				
PRESENT VALUE OF																					
NET LOCAL TAXES	\$70.71																				
*Induced spending allocated according to relative shares of spending.																					



Appendix II: REMI OUTPUT



C	Differences	Mills s as Com	tone Nucl pared to	ear Powe REMI Sta	er Plants ndard Re	gional Co	ontrol		
			Fairfield	County,	СТ				
Variable	2000	2001	2002	2003	2004	2005	2010	2015	2020
Employment (Thous)	0.7761	0.6914	0.6186	0.5528	0.4988	0.4564	0.3797	0.3932	0.4227
GRP (Gross Regional Prod	0.1218	0.1187	0.1158	0.1132	0.1111	0.1095	0.1067	0.1087	0.1119
Personal Income (Bil Nom \$	0.03855	0.0389	0.03799	0.03669	0.03533	0.0341	0.03376	0.03954	0.04807
PCE-Price Index 92\$	0.01906	0.02412	0.02582	0.02577	0.02464	0.02315	0.01683	0.01553	0.01616
Real Disp Pers Income (Bil	0.01745	0.01648	0.01541	0.01445	0.01366	0.01302	0.01256	0.0138	0.01538
Population (Thous)	0.1167	0.2487	0.3217	0.374	0.4142	0.4432	0.51	0.5345	0.5374
Economic Migrants	0.1156	0.1284	0.06612	0.04744	0.0327	0.02113	0.000658	-0.00273	-0.00459
Total Migrants	0.1156	0.1283	0.06609	0.04739	0.03264	0.02108	0.000512	-0.00296	-0.00489
Labor Force	0.1045	0.1761	0.2112	0.2252	0.2336	0.2365	0.2319	0.2411	0.2603
Demand (Bil 92\$)	0.06044	0.05382	0.04751	0.04184	0.03696	0.03301	0.02664	0.0295	0.03435
Output (Bil 92\$)	0.2243	0.2169	0.21	0.2038	0.1987	0.1945	0.1878	0.191	0.1964
Relative Profitability Manufa	-0.00017	-0.00021	-0.00023	-0.00023	-0.00022	-0.0002	-0.00013	-0.00011	-9.8E-05
Labor Intensity	-3.52E-06	-1.7E-05	-2.8E-05	-3.6E-05	-4.2E-05	-4.5E-05	-4.7E-05	-4.3E-05	-3.8E-05
Regional Purchase Coeffici	-6.4E-05	-5.8E-05	-5.2E-05	-4.7E-05	-4.1E-05	-3.5E-05	-2E-05	-1.2E-05	-7.4E-06
Imports (Bil 92\$)	0.03488	0.03125	0.02775	0.02461	0.02182	0.0195	0.0156	0.01693	0.01954
Self Supply (Bil 92\$)	0.02556	0.02257	0.01976	0.01723	0.01514	0.01351	0.01105	0.01257	0.01482
Exports US/ROW (Bil 92\$)	-0.00136	-0.00295	-0.00443	-0.00575	-0.00682	-0.00763	-0.00874	-0.00822	-0.00785
Exports - MR (Multi-Region	0.04826	0.04547	0.04283	0.04051	0.03849	0.0368	0.03364	0.03481	0.03757
Wage Rate (Thous Nom\$)	0.01191	0.01551	0.01659	0.01655	0.01574	0.01457	0.01022	0.009659	0.01093



		Millst	one Nucl	ear Powe	r Plants				
C	Differences	s as Com	pared to I	REMI Sta	ndard Re	gional Co	ontrol		
		Ν	lew Have	n County	, CT				
Variable	2000	2001	2002	2003	2004	2005	2010	2015	2020
Employment (Thous)	0.3751	0.3334	0.2942	0.2582	0.229	0.2072	0.1782	0.1962	0.2178
GRP (Gross Regional Produ	0.1113	0.1104	0.1094	0.1085	0.1078	0.1075	0.107	0.1086	0.1105
Personal Income (Bil Nom \$	0.02536	0.02583	0.02513	0.02399	0.02275	0.0216	0.02048	0.02406	0.0295
PCE-Price Index 92\$	0.01753	0.02051	0.02071	0.01939	0.01747	0.01538	0.008896	0.008118	0.008606
Real Disp Personal Income	0.01278	0.01248	0.01183	0.01115	0.01051	0.009954	0.009285	0.01009	0.01124
Population (Thous)	0.121	0.2521	0.3174	0.3607	0.386	0.3992	0.4005	0.3915	0.3832
Economic Migrants	0.1199	0.1275	0.05964	0.03629	0.01842	0.006007	-0.00786	-0.00565	-0.00491
Total Migrants	0.1199	0.1275	0.05961	0.03626	0.0184	0.005987	-0.0079	-0.0057	-0.00499
Labor Force	0.1245	0.2192	0.2616	0.2828	0.2908	0.2909	0.2643	0.2652	0.2826
Demand (Bil 92\$)	0.03971	0.03637	0.03252	0.02883	0.02567	0.02309	0.01943	0.02194	0.02531
Output (Bil 92\$)	0.2033	0.1999	0.1964	0.1934	0.1909	0.189	0.1869	0.1895	0.1928
Relative Profitability Manufac	-0.000132	-0.00016	-0.00016	-0.00015	-0.00013	-0.00011	-4.9E-05	-3.6E-05	-3.2E-05
Labor Intensity	-2.80E-06	-9.1E-06	-1.5E-05	-1.9E-05	-2.2E-05	-2.3E-05	-2.4E-05	-2E-05	-1.7E-05
<b>Regional Purchase Coefficie</b>	-8.25E-05	-8E-05	-7.7E-05	-7.2E-05	-6.7E-05	-6.2E-05	-4.4E-05	-3.5E-05	-3E-05
Imports (Bil 92\$)	0.02288	0.02123	0.01931	0.01736	0.01565	0.01421	0.01192	0.01309	0.01483
Self Supply (Bil 92\$)	0.01684	0.01514	0.0132	0.01147	0.01001	0.008898	0.007511	0.008846	0.01048
Exports US/ROW (Bil 92\$)	-0.000755	-0.00156	-0.00226	-0.00281	-0.00319	-0.00342	-0.0031	-0.00246	-0.00213
Exports - MR (Multi-Region)	0.01711	0.01616	0.01532	0.01455	0.01388	0.01334	0.01229	0.01299	0.01433
Wage Rate (Thous Nom\$)	0.01048	0.01155	0.01118	0.01017	0.008869	0.007519	0.003849	0.003502	0.003914



		Millst	one Nucl	ear Powe	r Plants				
1	Difference	s as Com	pared to	REMI Sta	ndard Re	gional Co	ontrol		
			Hartford	County, C	<u>T                                    </u>				
Variable	2000	2001	2002	2003	2004	2005	2010	2015	2020
Employment (Thous)	0.835	0.7656	0.7026	0.6414	0.5898	0.5493	0.4838	0.5068	0.5435
GRP (Gross Regional Produ	0.1476	0.1455	0.1431	0.1408	0.1389	0.1374	0.1349	0.1374	0.1413
Personal Income (Bil Nom \$	0.03864	0.04031	0.0402	0.03926	0.03804	0.0368	0.03648	0.04251	0.05122
PCE-Price Index 92\$	0.02641	0.03238	0.03416	0.03351	0.03171	0.02933	0.02122	0.01973	0.01991
Real Disp Personal Income	0.01869	0.01851	0.01785	0.01707	0.01631	0.01565	0.01499	0.01624	0.01792
Population (Thous)	0.1668	0.3534	0.4575	0.5317	0.5815	0.6129	0.6642	0.6778	0.6691
Economic Migrants	0.1649	0.1818	0.09575	0.06402	0.03908	0.02127	-0.00476	-0.00685	-0.0093
Total Migrants	0.1649	0.1818	0.0957	0.06397	0.03903	0.02122	-0.00489	-0.00704	-0.00955
Labor Force	0.1678	0.2973	0.3611	0.3972	0.4143	0.42	0.4008	0.408	0.4351
Demand (Bil 92\$)	0.07448	0.06932	0.06351	0.0578	0.05258	0.04828	0.04122	0.04486	0.05083
Output (Bil 92\$)	0.2543	0.2481	0.242	0.2364	0.2316	0.2277	0.2218	0.2261	0.233
Relative Profitability Manufa	-0.000178	-0.00023	-0.00024	-0.00023	-0.00021	-0.00018	-0.0001	-7.8E-05	-6.5E-05
Labor Intensity	-2.86E-06	-1.2E-05	-2E-05	-2.6E-05	-3E-05	-3.3E-05	-3.4E-05	-2.9E-05	-2.2E-05
Regional Purchase Coefficie	-0.000106	-0.00011	-0.00011	-0.00011	-0.0001	-9.7E-05	-7.7E-05	-6.4E-05	-5.5E-05
Imports (Bil 92\$)	0.04146	0.0391	0.03647	0.03374	0.03108	0.02885	0.025	0.02675	0.02978
Self Supply (Bil 92\$)	0.03302	0.03022	0.02704	0.02407	0.0215	0.01944	0.01621	0.01812	0.02105
Exports US/ROW (Bil 92\$)	-0.00124	-0.00267	-0.00401	-0.00514	-0.00601	-0.00664	-0.00706	-0.00621	-0.00548
Exports - MR (Multi-Region)	0.0415	0.0396	0.03796	0.03645	0.03508	0.03393	0.03163	0.03324	0.03646
Wage Rate (Thous Nom\$)	0.01368	0.01694	0.0175	0.0167	0.01521	0.01343	0.007774	0.006481	0.006454



	lifference	Mills	tone Nucl	ear Powe	r Plants	aional Ca	ntrol		
L	merences	s as Com N	lew Londo	on County	ndard Re /, CT	gional Co	ntroi		
Variable	2000	2001	2002	2003	2004	2005	2010	2015	2020
Employment (Thous)	4.968	4.554	4.19	3.871	3.601	3.38	2.878	2.839	2.939
GRP (Gross Regional Produ	0.3348	0.3277	0.3189	0.312	0.3066	0.3031	0.308	0.3329	0.3654
Personal Income (Bil Nom \$	0.1978	0.2059	0.2072	0.2072	0.2063	0.2051	0.2144	0.2409	0.2792
PCE-Price Index 92\$	0.4959	0.6042	0.6524	0.6616	0.65	0.628	0.5109	0.4507	0.4386
Real Disp Personal Income	0.0999	0.09955	0.09696	0.09497	0.09324	0.09177	0.09199	0.09675	0.1027
Population (Thous)	1.038	2.17	2.684	3.085	3.39	3.602	4.022	3.988	3.755
Economic Migrants	1.029	1.105	0.482	0.3534	0.2404	0.1547	-0.01594	-0.06711	-0.07593
Total Migrants	1.029	1.105	0.4817	0.353	0.2401	0.1544	-0.01675	-0.06825	-0.07736
Labor Force	0.8706	1.466	1.686	1.827	1.91	1.945	1.922	1.963	2.031
Demand (Bil 92\$)	0.7317	0.696	0.6595	0.6289	0.5995	0.5751	0.5285	0.5433	0.5813
Output (Bil 92\$)	0.5327	0.5157	0.4966	0.4815	0.4697	0.4614	0.4648	0.5056	0.5597
Relative Profitability Manufa	-0.005017	-0.00643	-0.00709	-0.00729	-0.00722	-0.007	-0.00549	-0.00451	-0.00406
Labor Intensity	-1.57E-04	-0.00103	-0.00173	-0.00228	-0.0027	-0.00303	-0.00375	-0.00377	-0.00356
Regional Purchase Coefficie	-0.006905	-0.00667	-0.0066	-0.00652	-0.00636	-0.00622	-0.00552	-0.00505	-0.00481
Imports (Bil 92\$)	0.5551	0.5301	0.5062	0.4862	0.466	0.4492	0.4176	0.4297	0.4587
Self Supply (Bil 92\$)	0.1766	0.1659	0.1533	0.1427	0.1335	0.1259	0.1108	0.1135	0.1226
Exports US/ROW (Bil 92\$)	-0.008626	-0.01845	-0.02778	-0.03616	-0.0432	-0.04886	-0.06125	-0.06068	-0.05759
Exports - MR (Multi-Region)	0.000526	-0.00204	-0.00453	-0.00676	-0.00865	-0.01018	-0.01282	-0.01245	-0.0114
Wage Rate (Thous Nom\$)	0.6525	0.7008	0.7171	0.7183	0.709	0.6947	0.6596	0.6861	0.7651



		Millst	one Nucle	ear Powel	Plants				
L	lifferences	s as Comp	Dared to F	REMI Star	ndard Reg	gional Co	ntrol		
	2000	0004	0000	2002	0004	2005	2010	2015	2020
variable	2000	2001	2002	2003	2004	2005	2010	2015	2020
Employment (Thous)	7.393	6.749	6.173	5.653	5.216	4.866	4.155	4.191	4.406
GRP (Gross Regional Produ	0.8085	0.7947	0.7782	0.7644	0.7533	0.7456	0.7437	0.7763	0.8198
Personal Income (Bil Nom \$)	0.344	0.3566	0.3561	0.3518	0.3458	0.3399	0.3466	0.394	0.464
PCE-Price Index 92\$	0.05302	0.06451	0.06868	0.06848	0.06602	0.06253	0.04767	0.04242	0.04199
Real Disp Personal Income (	0.1728	0.1712	0.1657	0.1606	0.1559	0.1519	0.1493	0.1584	0.1706
Population (Thous)	1.691	3.547	4.45	5.122	5.606	5.929	6.489	6.442	6.14
Economic Migrants	1.675	1.81	0.8397	0.5891	0.3808	0.2267	-0.044	-0.101	-0.1091
Total Migrants	1.675	1.81	0.8392	0.5886	0.3803	0.2263	-0.04519	-0.1026	-0.1112
Labor Force	1.522	2.63	3.1	3.375	3.524	3.578	3.473	3.529	3.675
Demand (Bil 92\$)	0.9617	0.9077	0.8506	0.8004	0.7536	0.7149	0.6456	0.6726	0.7299
Output (Bil 92\$)	1.385	1.347	1.308	1.274	1.247	1.227	1.212	1.266	1.34
Relative Profitability Manufac	-0.000486	-0.00062	-0.00067	-0.00067	-0.00065	-0.00061	-0.00044	-0.00036	-0.00032
Labor Intensity	-1.38E-05	-8.1E-05	-0.00014	-0.00018	-0.00021	-0.00024	-0.00029	-0.00028	-0.00026
Regional Purchase Coefficie	-0.000848	-0.00081	-0.00079	-0.00077	-0.00073	-0.0007	-0.0006	-0.00053	-0.00049
Imports (Bil 92\$)	0.5638	0.5388	0.5128	0.49	0.4668	0.4474	0.4127	0.4265	0.4563
Self Supply (Bil 92\$)	0.3978	0.3689	0.3378	0.3104	0.2868	0.2675	0.2329	0.2461	0.2737
Exports US/ROW (Bil 92\$)	-0.01303	-0.02787	-0.04173	-0.05389	-0.06384	-0.07152	-0.08475	-0.08099	-0.07567
Exports - MR (Multi-Region)	0	0	0	0	0	0	0	0	0
Wage Rate (Thous Nom\$)	0.05481	0.06065	0.06211	0.06154	0.05968	0.05726	0.05022	0.05106	0.05669



# Appendix III: Modeling Strategy

## Stage 1: Policy Variables

- ✓ Output without employment and investment (because we are not tearing down the building) (Population weighted distribution across the counties).
- Nullify intermediate input induced by sales (we have precise amount of money Millstone spends for goods and services in Connecticut. Therefore, we do not want the model to take care of intermediate input issue).
- ✓ Intermediate input (as final sale) by counties and sectors.
- ✓ Employment by place of work (public utilities and miscellaneous professional services) all in New London County.
- ✓ Wage Adjustment for New London County

# Stage 2: Policy Variables

- ✓ All the variables from stage 1 *PLUS*
- ✓ State and local spending (we know *a priori* that Millstone pays \$33 million property tax. This tax is part of the total output of Millstone. Therefore, removing Millstone will reduce the government spending by \$33 million. However, at the first stage, total induced government spending was less than \$33 million. We take the difference between \$33 million and induced government spending, and insert the difference as new policy variable into the model. The purpose of this exercise is to see how much impact the decrease in local spending would have on overall economy).
  - ✓ When we run the model and get the results, in the tax worksheet, we take the difference between model generated induced government spending and \$33million property tax. The difference will be reported as the net induced government spending (exclusive of \$33 million).

