



Economic Impact of NPU on Norwich and New London County

Prepared for:

Norwich Public Utilities

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Executive Summary

NPU contributions to Norwich, exclusive of capital investments, exceed \$12.9 million annually. In and of themselves, NPU's community activities make sustained contributions to Norwich and its citizens' economic wellbeing ranging annually from:

- 130 to 189 additional jobs each year between 2016 and 2036;
- Generating additional annual Real Gross Domestic Product of \$11.3 million to \$15.2 million (in 2009\$);
- Putting an additional \$ 11.3 million to \$24.1 million a year in real disposable personal income into the hands of individuals and households;
- Generating annual consumption of \$16.0 million to \$40.2 million in current dollars; and,
- Expanding state and local government coffers annually by \$1.1 million to \$4.7 million.

In addition, planned NPU investments increase impacts considerably, especially in the near term when they are well defined. The longer term investment outlook is less well defined and not as populated for understandable reasons ranging from the unpredictability of storms and uncertainties about developing markets. For those reasons, CCEA limits its impact analysis to 2022, with comments on more distant impacts.

Over the 2017-2022, NPU community activities and planned investment will expand economic activity in New London County by at least:

- Adding 199 to 777 jobs annually;
- Generating additional Real Gross Domestic Product of \$221 million (in 2009\$);
- Putting an additional \$167 million in real disposable personal income into the hands of individuals and households;
- Expanding consumption expenditures by \$187 million in current dollars; and
- \$26 million in additional state and local government revenues.

Because employment and expenditures are largely in Norwich, the vast majority of the impacts will also be in the City or in close proximity. NPU thus clearly delivers value to the City of Norwich and its citizens.

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Economic Impact of NPU on Norwich and New London County

Introduction

In addition to supplying Norwich with natural gas and reliable electricity energy,¹ wastewater treatment, and water, Norwich Public Utilities (NPU) supports the city directly through support for various local activities. This report provides an analysis of the direct and indirect value of those support activities. Because the smallest jurisdiction within the REMI model² (on which CCEA relies for this assessment) is the county, impacts will be those felt throughout the county. Yet, because direct expenditures are made in Norwich, their impacts are largely concentrated in and around the City.

To project direct impacts, CCEA allocated specific NPU support activities into economic sectors used in REMI. Except for special projects being undertaken for specified durations such as the reconstruction of historic sites, CCEA in consultation with NPU assumed commitments in support of the City and charities were annual in 2015 dollars. While support may change over time, as long as NPU maintains the same real level in support of similar projects, impacts will be remain essential the same.

The first section clarifies the direct impact of how NPU supports the community and the allocation of those activities and their funding within REMI, inclusive of both those activities that can be quantified in monetary and non-pecuniary (not paid for) amenities. The first section also includes \$8.5 annually paid directly to the city in 2015 dollars. This amount, generated by NPU for the city, is a generous alternative to the 9.53% of property taxes paid utilities in the average Connecticut jurisdiction. It is modelled as facilitating a cut in property taxes paid by others. The second allocates those funds over time. This process facilitates running the economic impacts analysis so that it captures the benefits flowing from a local utility supporting its hometown. The first REMI scenario identifies the impacts of these supportive activities only. The second scenario includes future capital investments.

Both scenarios report on total impacts in New London County on employment, GDP, personal income, disposable personal income, and consumption.

¹ In 2016, the average number of outages per customer was 0.64; the average amount of time out of service was 56.3 minutes, or reliability of 99.91% for the year.

² REMI is the acronym for the dynamic model of Connecticut's economy developed by Regional Economic Models, Inc. of Amherst, MA. REMI has been the model on which Connecticut has relied for impact analysis since 1992.

NPU Support Activities

Background

Column 3 of Table 1 captures the diversity of NPU’s support for and contributions to Norwich. It also aligns NPU community support with REMI designated sectors.

Table 1: NPU Activities in Support of Norwich

REMI Activities	Expenditures	NPU Input	Expenditures
Pipeline Construction	\$ 750,000	Installation & Maintenance of Hydrants	\$ 750,000
Transit and Ground Transportation	\$ 48,332	Savings from Use of CNG Rather Than Gasoline	\$ 48,332
Internet	\$ 154,500	Internet Cost savings	\$ 35,500
		Cost Saving on Wireless Access Points	\$ 600
		Fiber Services	\$ 118,400
Telecommunications	\$ 149,009	Radio Systems	\$ 12,500
		Remote Access to Plain Hill Tower	\$ 3,480
		Public Services Camera Services	\$ 42,305
		Phone Services	\$ 90,724
Repair & Maintenance	\$ 205,000	Maintain Traffic Lights	\$ 140,000
		HVAC Maintenance of City Facilities	\$ 65,000
Electricity Installation	\$ 431,419	Holiday Light Installation (Excluding repairs, replacements, and electricity)	\$ 131,419
		Construction Assistance to Power and Communications Structures	\$ 300,000
Utilities	\$ 1,150,000	Energy Assistance Program	\$ 1,150,000
Appliances	\$ 300,000	Appliances Rebates and Incentives	\$ 300,000
Professional Services	\$ 479,800	Service Resource to Norwich	\$ 79,800
		Energy assessments	\$ 400,000
Nursing & Residential Care Tax Credit Programs	\$ 336,250	20 Elizabeth Street and Hillside Apts.	\$ 336,250
Museums Care Tax Credit Programs	\$ 38,951	Museums	\$ 38,951
Charitable Donations	\$ 115,000	Sponsorships	\$ 65,000
		United Way Employee Contributions	\$ 35,000
		United Way Day of Caring	\$ 10,000
		Food Pantry	\$ 5,000

In addition to the \$4,158,262 Table 1 identifies, NPU substituted natural gas as a fuel for gasoline, thereby saving \$48,332 in avoided GHG releases³ and the annual payment of \$8.5 million to the city has been included. With the exception of the museum support, which is a one-off donation to support restoration of two historic buildings, CCEA has utilized the above numbers in 2015 dollars out to 2036, the end year of this study.

Impacts from NPU Support of Norwich

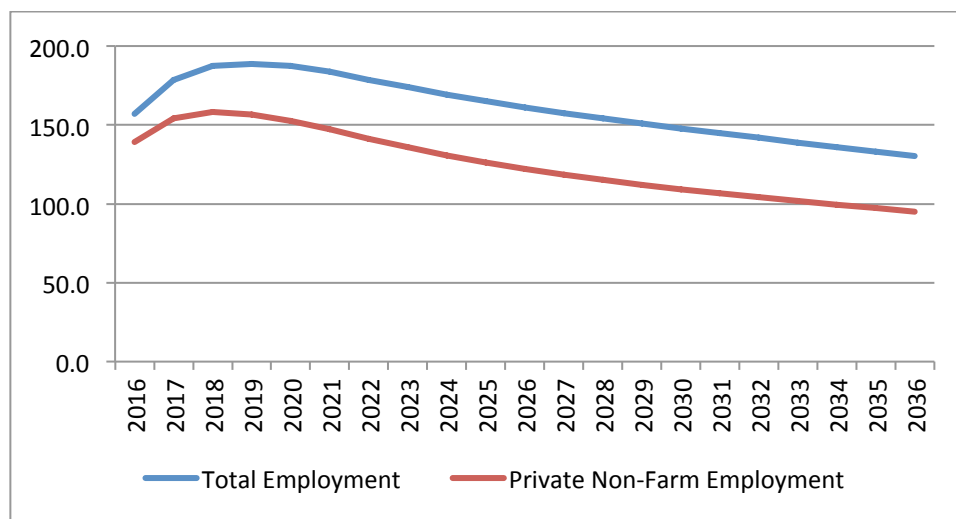
This section tracks the impacts of NPU support in Norwich on employment, measured in jobs, Gross Domestic Product (GDP), real disposable personal income (in constant 2009 dollars), and both personal income and disposable personal income (in current dollars). Disposable personal income is important because it measures the ability of individuals or households to consume goods and services.

Employment

Chart 1 tracks employment impacts through time; the model presumes that with increasing productivity the total number of jobs will slowly contract. That chart also illustrates that the vast majority of the enhanced employment is in private non-farm jobs.

Given the level of NPU expenditures, the initial direct, indirect, and induced employment is high at 190 in 2018-2019, peaking with the renovation of the historical schools before a slow shrinkage thereafter down to 130 as labor productivity rises. Impacts on government and farm employment are in the range of 29 to 35 jobs from 2018.

Chart 1: Employment Impacts from NPU Support of Norwich (# of Jobs)

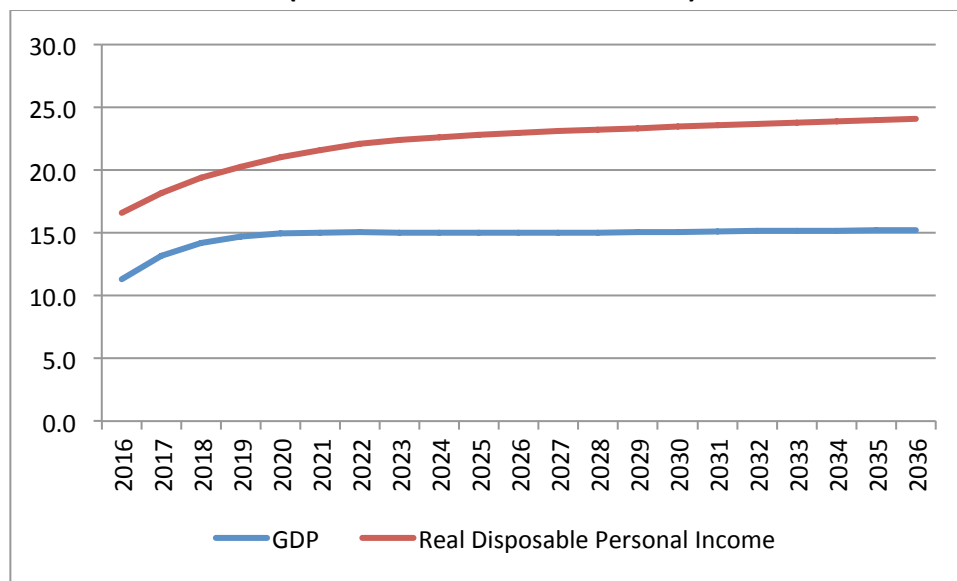


³ This estimate is modest and uses the last traded price for GHG from the Alberta exchange. See: <http://calcarbodash.org/> (Sept 1, 2017)

GDP and Real Disposable Personal Income

Remembering that RGDP can be measured as the sum of the value added being generated by all activities in the economy, net of any content from outside the region, the RGDP measured within the narrow confines of New London is solid starting at \$16.6 million in 2016 and rising at decreasing rates out to 2036 when it hits \$24.1 million in fixed 2009 dollars. See Chart 2.

Chart 2: GDP and Real Disposable Personal Income Impacts from NPU Support for Norwich (Millions of Fixed 2009 Dollars)



From 2019 and thereafter over half the RGDP impacts, from \$11.3 to \$15.2 million annually, take the form of increased Real Disposable Personal Income. That is the income enjoyed by individuals or household after paying personal taxes, which expands citizen's choices over consumption and savings.

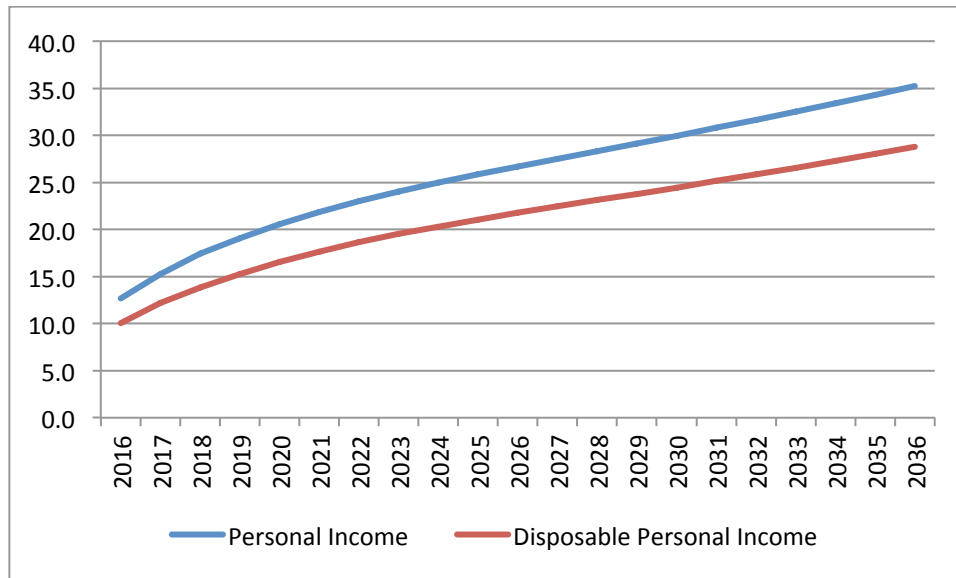
Current Personal Income and Disposable Personal Income

In contrast to their modestly increasing real (constant value) counterparts, as Chart 3 reveals inclusive of inflation current personal income and current disposable personal income rise more sharply. In current or as spent dollars, PI rise from \$12.7 million in 2016 to \$35.2 million by 2036.

It is worth noting that differences between the personal income and disposable personal income represent increased revenues from personal taxes flowing from NPU's support for Norwich community activities. Personal taxes paid to the federal and states governments rise annually from \$3.1 million in 2016 to \$6.4 million by 2036. In general, while a significant share of those payments leak out of the state to the federal government, about 23.5% remain in Connecticut. Additionally over the period, Connecticut sales tax receipts increase from

\$271,000 to \$2,140,000. In addition, other state and local tax impacts rise steadily from \$1.09 million in 2017 to \$4.17 million in 2036.

Chart 3: Personal Income and Disposable Personal Income Impacts from NPU Support for Norwich (Millions of Current Dollars)



NPU Investments

Background

NPU has already committed to investments through 2022. Beyond 2022, NPU has not fully completed specific plans and commitments; for that reason this analysis does not include likely and potential investments beyond 2022. The result is that Chart 4 shows impacts dropping off after 2022, *but only because the analysis does not fully include additional new investments*. It is reasonable to expect that NPU will continue to make significant additional investments beyond 2022; the projection of impacts is thus highly conservative.

These construction impacts and ITCs include the previous ones attached to NPU’s community activities. They would be strengthened by data on expected incremental revenues stemming from the investments in new plant and equipment in improved services and expanding markets.

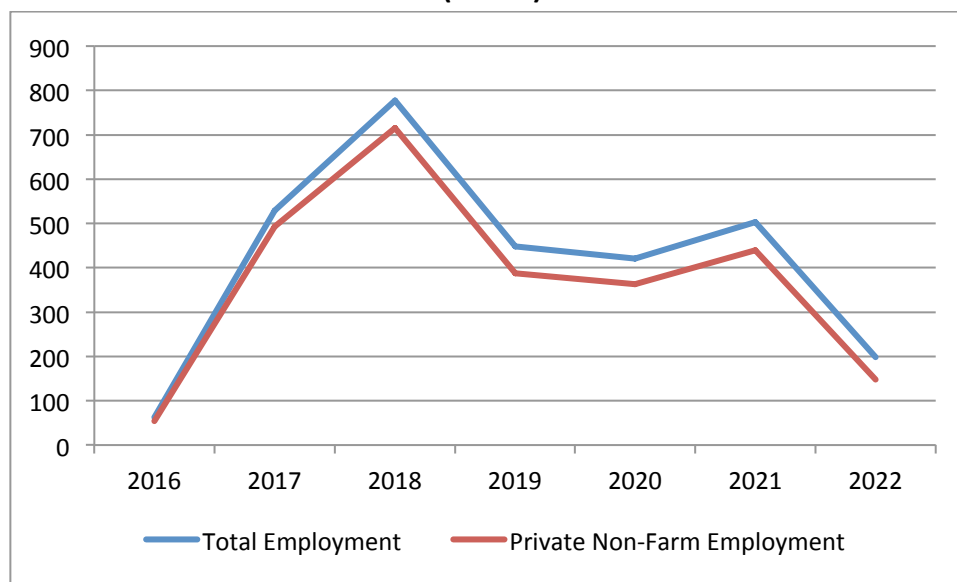
Impacts from Planned Construction and NPU Support for Norwich

Employment including Construction

In addition to its own resident labor force, New London’s citizens benefit from employment in construction, related professional services, and indirect jobs supplying not only construction

materials and supplies but also machinery and equipment and components integral to NPU operations. As expected, Chart 4 illustrates that prior to 2022 job impacts exceed by a considerable margin those flowing from community support activities.

Chart 4: Employment Impacts from NPU Construction and Support for Norwich Programs (# Jobs)



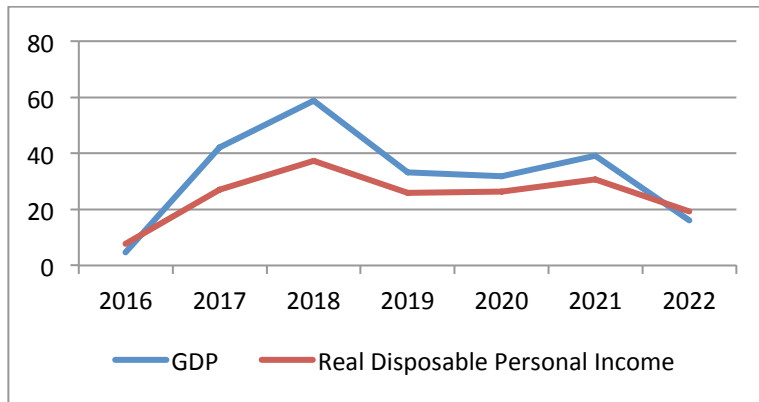
Because construction in 2016 is in the past, it is not included as part of the future impacts of planned construction; it adds nothing to the job impacts from NPU’s community. Employment impacts of currently planned construction reach 528 jobs in 2017 and peak at 777 jobs in 2018. Of these jobs only 61-69 annually are on farms or in government. Subsequent impacts, particularly those in 2022, are not as strong but are subject to change as plans evolve. Due to the likelihood of downward bias in 2022, investment expectation is high. As planned investments slow, dynamically the whole economy retracts compounding downward pressures arising from less than complete planning of future investments. Employment from planned construction projects in 2022 falls closer to within 20 jobs of NPU’s community activities. NPU’s investment profile after 2023 is sparsely populated and insufficient to be of real use in this study.

GDP and Real Disposable Personal Income Impacts including Construction

Chart 5 illustrates that these measures of income follow those of the jobs profile. They track well above those from NPU’s community support activities. Total GDP impacts are expected to peak in 2018 at \$59 million and Real Disposable Personal Income reaching \$37 million, both in fixed 2009 dollars. These metrics are all over and above the impacts of NPU’s own support activities. Again the estimates for the last two years above are downward biased because

investment and construction activities within those years are highly likely to be stronger when NPU adds to current plans.

Chart 5: GDP and Real Disposable Personal Income Impacts from NPU Planned Investments and Support for Norwich (Millions of Fixed 2009 Dollars)

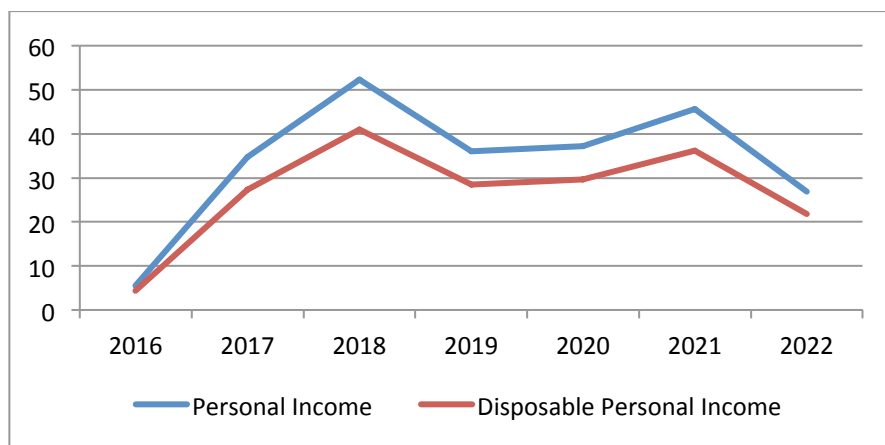


Note: Differences in timing of lagged effects can result in increments in DPI exceeding GDP for brief periods.

Current Personal and Disposable Personal Income with Construction

Chart 6 converts the Real Disposable Personal Income above to current dollars and adds personal income taxes to it to show Personal Income again in current dollars. Due to inflation, current Disposable Personal Income exceeds its real annual values reaching \$41 million in 2018; PI reaches \$52 million. More germane, the gap between the two represents personal income taxes paid. Those governments revenues peak in 2018 at \$11.3 million, of which \$2.7 million goes to the State (based on a 23.5% annual share.) By 2036, incremental personal taxes paid over the base year shrink to \$5.1 million, with a commensurate shrinkage of incremental personal taxes accruing to the state.

Chart 6: Personal Income and Disposable Personal Income Impacts from NPU Investment and Support for Norwich (Millions of Current Dollars)



In 2018, other tax sources, including sales and property taxes, add another \$779,000 to State and local governments' coffers. Over the five years, 2017 to 2021 inclusive, the NPU construction and community activities generate \$48.3 million in personal income tax, of which \$11.2 million goes to the State, while other revenues sources generate another \$14.2 million.

Longer-Term Prospects

The relatively high levels planned for construction in the short-term result first in a sharp drop post construction from 2024 to 2032, during which, due to NPU's community activities, employment impacts remain above 75 but below 100. From 2032 out to 2036 the economy is more robust due to some additional NPU investments. Such impacts are, however, modest, with an addition of 106 jobs in 2036. Once again, by the time projects are added to current plans, these longer-term NPU future investment impacts can be expected to be more robust than the current results suggest.

Conclusions

Investments aside, NPU contributions to Norwich exceed \$12.9 million annually. In and of themselves, NPU's community activities make sustained significant contributions to Norwich and its citizens' wellbeing; these benefits range annually from:

- 130 to 189 additional jobs each year between 2016 and 2036;
- Generating additional Real Gross Domestic Product of \$11.3 million to \$15.2 million (in 2009\$);
- Putting an additional \$ 11.3 million to \$24.1 million in real disposable personal income into the hands of individuals and households;
- Generating consumption of \$16.0 million to \$40.2 million in current dollars; and,
- Expanding state and local government coffers by \$1.1 million to \$4.7 million.

In addition, planned NPU investments increase impacts considerably, especially in the near term, when they are well defined. The longer-term investment outlook is less well defined and not as populated for understandable reasons, ranging from the unpredictability of storms and uncertainties about developing markets. For that reason, CCEA limited its projection of impacts to include only investments to 2022, with brief comments on more distant impacts.

Over the 2017-2022 period, NPU community activities and planned investments together will add to the economic activity in New London County by:

- Adding 199 to 777 jobs annually;
- Generating additional Real Gross Domestic Product of \$221 million (in 2009\$);

- Putting an additional \$167 million in real disposable personal income into the hands of individuals and households;
- Expanding consumption expenditures by \$187 million in current dollars; and
- Augmenting state and local government coffers by \$26 million.

Due to employment and expenditures being focused in the City of Norwich, the vast majority of impacts will be within or in close proximity to it. Overall, NPU clearly delivers value to the City and its residents.

Appendix 1 – About CCEA

The Connecticut Center for Economic Analysis (CCEA) is a University Research Center in the School of Business at the University of Connecticut (UConn).

CCEA specializes in economic impact analysis and policy studies as well as advising clients regarding business strategy, market analysis, and related topics. CCEA focuses particular attention on the economic and business dynamics of Connecticut, for which it maintains a license to the dynamic REMI model of the state's economy.

CCEA was created at the request of Governor Weicker in 1992 to serve the state's citizens by providing timely and reliable information regarding Connecticut's economy and to evaluate the potential impacts of proposed policies and strategic investments. CCEA aims to equip the public and decision makers with transparent analyses to facilitate systematic, thoughtful debate of public policy issues.

CCEA has conducted hundreds of studies involving the Connecticut economy, at both the state and local levels. Copies of its studies and reports available to the general public may be found at <http://ceea.uconn.edu/>. For additional information about CCEA, please contact Professor Fred Carstensen (fred.carstensen@uconn.edu).