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The Macroeconomic Impact of Senator Elizabeth Warren's Clean Energy Plan

Introduction

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The Macroeconomic Impact of Senator Elizabeth Warren's Clean Energy Plan

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Climate change and the nation's increasingly poor public infrastructure top the long list of serious U.S. public policy challenges. Presidential candidate Senator Elizabeth Warren has proposed a clean energy plan to address both of these top problems. The plan will have meaningful macroeconomic benefits, adding to the nation's GDP and jobs, if implemented. The plan may also help mitigate the humanitarian crisis created by climate change, although that is outside the scope of this analysis.

Clean energy plan

Under Senator Warren's clean energy plan, the federal government significantly increases its efforts to reduce its carbon emissions. This is done in multiple ways, but most notably the government ramps up spending on clean energy products for its use such as zero-emission vehicles and buildings. Government corporations that produce electricity such as the Tennessee Valley Authority will be required to transition to a cleaner power mix. And the federal government will use its spending authority to induce state and local governments to be more green. Senator Warren estimates the cost of these efforts at a sizable $1.5 trillion over the next decade, which is approximately equal to the amount budgeted for defense procurement.

The plan has safeguards to ensure that the clean energy products purchased by the federal government are made in the U.S., and those businesses supplying the products pay their workers at least $15 an hour and provide other benefits such as paid family leave.

Also part of the Warren clean energy plan is $100 billion over 10 years to fund spending by foreign governments on American-made products. The intent is to use the sale of these goods to encourage countries to make regulatory and legal changes to reduce their carbon emissions. This program will be fashioned off of the U.S. Defense Department's program that enables the sale of U.S. military equipment and armaments to other countries.

Finally, $400 billion in funding over the next decade is put into clean energy research and development. To facilitate the R&D effort, Senator Warren's clean energy plan would establish a National Institute of Clean Energy, similar in concept to the National Institutes of Health that is focused on cutting-edge medical research. Monies will also scale up a range of existing programs within the federal government that support clean energy research.

Paying for it

The static budget cost of Senator Warren's clean energy plan—not accounting for the economic impact of the plan and the resulting impacts on government spending and revenues—is an estimated $2 trillion over the 10-year budget horizon.

This cost will be paid for in part by Senator Warren's proposed "real corporate profits tax" —a 7% tax surcharge on profits of more than $100 million earned by U.S. companies. According to an outside analysis, this tax would generate $1.05 trillion in additional revenues over the next decade. Some $100 billion in 10-year revenues would be generated by eliminating various tax subsidies to the oil and gas industries, and an additional $150 billion in 10-year revenues would be raised by adopting legislation to close corporate tax loopholes created by the Tax Cut and Jobs Act, which promotes offshoring by U.S. companies. According to the Congressional Budget Office, certain provisions in TCJA, including the halving of the corporate tax rate for profits earned overseas could increase corporations' incentive to locate tangible assets overseas. In total, the plan envisages some $1.3 trillion in additional static tax revenues.

Senator Warren's clean energy plan thus results in a static increase in the federal budget deficit of $700 billion over the next decade. The dynamic increase in the 10-year budget deficit—after accounting for the benefit of the stronger economy on government spending and revenues—is estimated at just over $100 billion.

Macroeconomic impact

To assess the macroeconomic impact of Senator Warren's clean energy plan, the Moody's Analytics model of the U.S. economy was simulated. Federal spending on infrastructure and R&D was increased by the amount stipulated in the plan, as were corporate taxes. It was assumed the plan begins in 2020 and the spending increases take two to three years to be fully implemented, given that some of the programs and the National Institute for Clean Energy are de novo. The tax increases are fully implemented in 2020.

The increase in federal spending affects the economy in the short term mainly by increasing aggregate demand, and in the longer run by gradually lifting productivity growth. Some infrastructure investments begin improving productivity soon after they are made, whereas other investments, like many in R&D, take much longer. Some investments also have stronger effects on productivity than others.

The economic boost provided by the increase in federal spending is partially offset by the economic drag resulting from the increase in corporate taxes under the plan. Higher corporate taxes increase the cost of capital for businesses, reducing business investment, and ultimately weighing on private-sector productivity. The somewhat higher budget deficit under the clean energy plan also results in an increase in interest rates that weighs on economic growth.

The net of these macroeconomic cross-currents is a stronger economy. The multipliers on the increased government spending—the change in GDP due to a change in government infrastructure and R&D spending—are larger than the multipliers on the higher corporate taxes. The largest average multiplier over the 10-year horizon was 1.33 on government infrastructure spending (see Table 1). The average R&D multiplier was only 1.0, but this reflects a much lower multiplier in the early years and a much higher multiplier by the end of the 10-year period. The tax multipliers are much smaller, ranging from 0.35 on the higher corporate tax rate to 0.16 for the elimination of the oil and gas tax breaks, as business investment decisions are much more sensitive to changes in the demand for their goods and services than to their cost of capital.

Table 1: Clean Energy Government Spending and Corporate Tax Multipliers

Government spending:	
Procurement of clean energy products	1.33
Financing foreign government purchases	1.16
Research & development	1.00
Corporate taxes:	
Corporate taxes	0.35
Oil & gas subsidies	0.18
Outsourcing loopholes	0.16

Note: Multiplier is the 10-yr avg of one-yr mutlipliers that measure the $ change in GDP for a $ change in spending and taxes.

Source: Moody's Analytics

Senator Warren's clean energy plan lifts real GDP growth by an estimated 0.1 percentage point per annum over the next decade (see Table 2). That is, under the baseline scenario, which does not include the plan, real GDP growth from 2020 through 2029 is expected to be 2.04% per annum. With the plan, real GDP is expected to grow by 2.14% per annum over the period. By 2029, real GDP is 1% higher due to the plan.

The boost to growth is strongest in the first several years of the plan, reflecting the increase in demand from the greater government spending. As the demand boost fades, the economy still benefits from stronger productivity growth, but this benefit is small, because it takes time for the increase in green public infrastructure to lift productivity more significantly. The full productivity benefits of the plan are not realized until well after the 10-year horizon.

Senator Warren's clean energy plan also creates more jobs. About a quarter million jobs are added in 2020, and by 2029 payroll employment increases by 1.2 million.

Some caveats

This analysis has several limitations. Most obviously, it does not consider any potential benefit from Senator Warren's plan on global climate change, although those benefits are likely to be small over the 10-year horizon. Addressing climate change also has humanitarian and societal benefits that go well beyond what the plan means for the economy.

Measuring the macroeconomic impact is also complicated by the numerous aspects of the clean energy plan that are new or that currently operate on a small scale. Assessing the economic impact of the plan using the Moody's Analytics model required a significant number of assumptions. Most important was the assumption that federal government spending on green products will have impacts similar to spending on more traditional infrastructure.

The plan as articulated by the senator is not explicit with regard to how the increase in federal government spending and R&D will be allocated across the various programs and initiatives the plan has identified. This allocation is important to determining the economic impact of the overall plan.

Finally, Senator Warren has proposed a number of sweeping changes to economic policy. These include an affordable housing plan, a child care plan, a plan to forgive student debt and expand funding for higher education, a wealth tax, and a real corporate profits tax. Given the scale of these proposals, to fully measure their economic impact they need to be considered in total.

Conclusions

Senator Warren's clean energy plan is a substantial effort to address two of the nation's most daunting challenges: global climate change and inadequate infrastructure. Changing the trajectory on climate change is difficult and will take persistence, time and resources. The senator's plan provides a big down payment on the resources. Fixing our inadequate infrastructure will require a similar commitment, and while the senator's plan is focused on only one aspect of our poor infrastructure, it is a start. There is no free lunch, and big businesses, oil and gas companies, and multinationals pay for the cost of this plan. The economy benefits, although it would take more than a decade for this benefit to be fully realized.

Table 2: Senator Warren's Clean Energy Plan

	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	Avg annual growth 2020-2029
Real GDP, 2012, $ bil											
Baseline	19,389	19,794	20,316	20,739	21,173	21,566	21,965	22,392	22,862	23,319	2.04
Clean-Energy Scenario	19,424	19,873	20,430	20,885	21,338	21,743	22,155	22,598	23,082	23,556	2.14
Difference	35.7	78.7	113.9	146.3	164.3	176.4	189.9	205.3	220.0	236.8	0.10
% Difference	*0.18*	*0.40*	*0.56*	*0.71*	*0.78*	*0.82*	*0.86*	*0.92*	*0.96*	*1.02*	
Nominal GDP, $ bil											
Baseline	22,180	23,095	24,189	25,180	26,210	27,204	28,234	29,342	30,541	31,765	4.03
Clean-Energy Scenario	22,222	23,186	24,324	25,359	26,414	27,426	28,478	29,612	30,835	32,087	4.13
Difference	*41.5*	*90.9*	*135.1*	*178.7*	*203.4*	*222.5*	*244.0*	*270.1*	*293.7*	*321.9*	*0.10*
Employment, mil											
Baseline	152.92	152.81	153.88	154.82	155.65	156.48	157.35	158.25	159.14	160.00	0.55
Clean-Energy Scenario	153.18	153.39	154.66	155.76	156.69	157.53	158.43	159.38	160.29	161.19	0.62
Difference	*0.26*	*0.58*	*0.78*	*0.94*	*1.04*	*1.05*	*1.08*	*1.13*	*1.15*	*1.19*	*0.07*
Federal budget deficit, $ bil											**Cumulative, 2020-2029**
Static deficit (-)	-2.5	-35.0	-58.5	-81.9	-81.2	-80.6	-79.4	-77.0	-74.0	-71.1	-709.5
Dynamic surplus (+) / deficit (-)	10.0	-11.8	-24.1	-36.3	-29.3	-23.8	-17.2	-8.1	0.9	11.0	-108.2

Source: Moody's Analytics

About the Author

Mark Zandi is chief economist of Moody's Analytics, where he directs economic research. Moody's Analytics, a subsidiary of Moody's Corp., is a leading provider of economic research, data and analytical tools. Dr. Zandi is a cofounder of Economy.com, which Moody's purchased in 2005.

Dr. Zandi is on the board of directors of MGIC, the nation's largest private mortgage insurance company, and is the lead director of Reinvestment Fund, one of the nation's largest community development financial institutions, which makes investments in underserved communities.

He is a trusted adviser to policymakers and an influential source of economic analysis for businesses, journalists and the public. Dr. Zandi frequently testifies before Congress and conducts regular briefings on the economy for corporate boards, trade associations, and policymakers at all levels. He is often quoted in national and global publications and interviewed by major news media outlets, and is a frequent guest on CNBC, NPR, *Meet the Press*, CNN, and various other national networks and news programs.

Dr. Zandi is the author of *Paying the Price: Ending the Great Recession and Beginning a New American Century*, which provides an assessment of the monetary and fiscal policy response to the Great Recession. His other book, *Financial Shock: A 360º Look at the Subprime Mortgage Implosion, and How to Avoid the Next Financial Crisis,* is described by the New York Times as the "clearest guide" to the financial crisis.

Dr. Zandi earned his BS from the Wharton School at the University of Pennsylvania and his PhD at the University of Pennsylvania.

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