

Job Creation Estimates for Pennsylvania through U.S. THRIVE Agenda

Program to Transform, Heal, and Renew by Investing in a Vibrant Economy—THRIVE

This report presents estimates of the job creation that would result in Pennsylvania if the U.S. Congress passes economic recovery legislation that implements a national THRIVE investment agenda, as described in a September 2020 Congressional resolution.¹ The overall finding we report here is that implementing the 10-year THRIVE investment agenda in Pennsylvania would generate about 372,000 jobs in the first full year of the program. This higher level of employment in Pennsylvania would be sustained throughout the 10 years of the investment program (assuming no other major changes in Pennsylvania's economy were to occur).² Thus, if the THRIVE program were implemented in full in 2021, employment in Pennsylvania would increase by 372,000 jobs and that higher level of employment would continue in the state as the 10-year program continues until 2030.

The Congressional resolution's commitment is to "Transform, Heal and Renew by Investing in a Vibrant Economy"—i.e. "THRIVE"—through a range of investments to rebuild the U.S. economy. To date, the THRIVE Agenda has been endorsed by more than 100 members of Congress, including Senate Majority Leader Chuck Schumer, and hundreds of major union, racial justice, and climate organizations.³ The aims of the THRIVE Agenda are similar to those proposed in the Build Back Better program advanced by President Biden during his 2020 presidential campaign.

1 <https://www.congress.gov/bill/116th-congress/house-resolution/1102/text>

2 Of course, other changes in Pennsylvania's economy will occur over the 10-year period 2021 – 2030, often in ways that cannot be predicted in advance. Still, our estimate of a 372,000 increase in employment under an "all else equal" assumption provides a benchmark for measuring the extent to which the THRIVE Agenda will expand job opportunities in the state, even after we allow that, in reality, economic conditions will undergo changes between 2021- 2030.

3 <https://www.thriveagenda.com>

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The THRIVE Agenda consists of four major investment areas:

1. Clean renewable energy and energy efficiency: To expand access to renewable energy and improve the energy efficiency of vehicles, buildings, and industries so as to achieve the climate stabilization goals set out by the Intergovernmental Panel on Climate Change (IPCC) of reducing carbon dioxide emissions by 45 percent by 2030 and to reach net zero emissions by 2050.

2. Infrastructure: To expand access to affordable transportation, high-speed broadband, clean water, upgrade parks and other public amenities, reduce pollution, and strengthen the public resources needed to undergird a manufacturing revival.

3. Agriculture and land restoration: To expand opportunities for family farmers, including younger farmers and people of color, and to support regenerative agriculture, local and regional food systems, and climate resilience.

4. Care economy, public health, and the postal system: To significantly expand and enhance the level of service provision in these crucial areas of the economy and to raise job quality standards—including wages, benefits, and workplace conditions—for workers employed in these activities.

For the U.S. as a whole, the THRIVE Agenda is designed as a 10-year investment program, with an average annual budget of \$954 billion.⁴ This would amount to about 4.0 percent of average U.S. Gross Domestic Product over 2021 – 2030, assuming that the U.S. economy grows at about 2.2 percent per year.

Our job creation estimates for Pennsylvania result from the state receiving its share of the overall THRIVE budget based on its share of the U.S. population. Because Pennsylvania accounts for 3.9 percent of the U.S. population, its share of the \$954.2 billion annual U.S. THRIVE budget would be \$37.2 billion per year. The proportions of total THRIVE spending in Pennsylvania will also be equal to their respective shares for the overall U.S. economy. In Table 1, we show Pennsylvania's annual budget allocations by investment area under THRIVE between 2021 – 2030. They amount to: \$14.0 billion for clean renewable energy and energy efficiency; \$12.7 billion for infrastructure; \$7.2 billion for agriculture and land restoration; and \$3.3 billion for the care economy, public health and postal service.

As we noted above and present in detail in the following tables, this level of investment spending in Pennsylvania will generate an average of about 372,000 jobs within the

⁴ In our March 2021 report *Employment Impacts of Proposed U.S. Economic Stimulus Programs: Job Creation, Job Quality, and Demographic Distribution Measures*, we describe the components of the overall U.S. THRIVE Agenda and the sources for the budget figures in the program's various investment areas. We also present details on our methodology for estimating job creation figures and related data presented for the national THRIVE program: <https://www.peri.umass.edu/publication/item/1397-employment-impacts-of-proposed-u-s-economic-stimulus-programs>.

TABLE 1: U.S. THRIVE Agenda Budget and Pennsylvania Budget Allocations through THRIVE
Pennsylvania population = 3.9% of U.S. population

	Overall U.S. THRIVE Agenda Budget		Pennsylvania THRIVE Agenda Budget Allocations
	U.S. THRIVE Agenda Budget Allocations	Shares of U.S. THRIVE Agenda Budget Allocations	
Clean renewable energy and energy efficiency	\$358.8 billion	37.6%	\$14.0 billion
Infrastructure	\$324.3 billion	34.0%	\$12.7 billion
Agriculture and land restoration	\$186.6 billion	19.5%	\$7.2 billion
Care economy, public health, and postal service	\$84.5 billion	8.9%	\$3.3 billion
Totals	\$954.2 billion	100%	\$37.2 billion

Source: <https://www.peri.umass.edu/publication/item/1397-employment-impacts-of-proposed-u-s-economic-stimulus-programs>.

state. This is equal to 5.7 percent of Pennsylvania’s labor force as of February 2020.⁵ To illustrate the potential impact of this level of job creation in Pennsylvania, let us assume that these investments are undertaken in the state, and all else about the state’s economy were to remain equal. Under such an “all else equal” assumption, this level of job creation would result, for example, in the state’s unemployment rate falling to 3.0 percent from its average level of 8.7 percent between July – December 2020. A reduction in Pennsylvania’s unemployment rate at something approximate to this scale would represent a major expansion in job opportunities throughout the state. Indeed, implementing the THRIVE Agenda in Pennsylvania would likely encourage a large number of people to enter Pennsylvania’s labor force, or to reenter after having dropped out because their prospects for getting hired had been discouraging. Overall, the rise in the state’s employment op-

⁵ In January 2021, we published a separate study, *Impacts of the Reimagine Appalachia & Clean Energy Transition Programs for Pennsylvania: Job Creation, Economic Recovery and Long-Term Sustainability*, which evaluates an investment program for Pennsylvania that is similar to, but not identical with, the THRIVE Agenda for Pennsylvania. The overall budget for the investment program in the earlier study amounts to an average of \$30.8 billion per year between 2021 – 2030, i.e. about 17 percent smaller than the \$37.2 billion average annual budget for Pennsylvania under THRIVE. Because this program is somewhat smaller than THRIVE, and also includes some differences in the details of the investment areas, our overall estimate of job creation is also lower, averaging about 243,000 jobs created per year between 2021 – 2030. See: <https://www.peri.umass.edu/economists/gregor123/item/1394-impacts-of-the-reimagine-appalachia-clean-energy-transition-programs-for-pennsylvania>.

portunities will provide a foundation for a broader improvement in living conditions for the people of Pennsylvania.⁶

Of course, this expansion in job opportunities would be in addition to the benefits to the people of Pennsylvania through implementing the THRIVE investment program—i.e. the benefits resulting from building a clean energy system throughout the state; deepening the state’s commitment to protecting its environment; enhancing productivity and business opportunities through upgrading the state’s infrastructure; widening opportunities in agriculture and land restoration; and raising quality standards in the provision of care economy, health care and postal delivery services.

⁶ In *Employment Impacts of Proposed U.S. Economic Stimulus Programs*, as cited above, we provide evidence on job creation at the national level within five major sectors of the U.S. economy: manufacturing; services; construction; wholesale and retail trade; and agriculture. For example, we report that manufacturing employment through the national THRIVE program will amount to 1.6 million jobs, equal to 10.3 percent of the 15.5 million overall level of job creation. This study of the U.S. economy-wide impact of the THRIVE Agenda also includes data on 1) wages, benefits and unionization rates for workers currently employed in the range of activities associated with the THRIVE Agenda; 2) educational attainment levels of these workers; and 3) shares of women and people of color employed in these activities at present. For Pennsylvania specifically, the separate 2021 study *Impacts of the Reimagine Appalachia & Clean Energy Transition Programs for Pennsylvania* provides extensive details on job quality and the demographic composition of the workforce specifically for an investment program similar to, though not identical with, the THRIVE Agenda.

PENNSYLVANIA Energy Efficiency and Clean Renewable Energy Investments through THRIVE Agenda

TABLE 2A: Energy Efficiency and Clean Renewable Energy Investments: Job Creation—Direct, Indirect, and Induced Jobs

	Job Creation per \$1 Million in Spending			
	1) Direct Jobs	2) Indirect Jobs	3) Induced Jobs	4) Total Jobs
<i>Energy efficiency</i>				
Building retrofits	4.4	2.0	2.4	8.8
Industrial efficiency	3.2	1.0	2.0	6.2
High-efficiency autos	0.2	0.1	0.1	0.4
<i>Renewable energy</i>				
Wind energy	1.7	1.3	2.0	5.0
Solar energy	2.1	1.5	2.4	6.0
Geothermal energy	5.0	1.8	3.2	10.0

TABLE 2B: Energy Efficiency and Clean Renewable Energy Investments: Total Jobs Created with Budgetary Figures

	1) Total Jobs/ \$1 Million	Annual Job Creation		Job-Years Created, All Years		
		Annual Budget	Job Creation per Year	# of Years	Total Budget	Total Job Years
<i>Energy efficiency</i>						
Building retrofits	8.8	\$2.2 billion	19,400	10	\$22.0 billion	194,000
Industrial efficiency	6.2	\$244.4 million	1,500	10	\$2.4 billion	15,000
High-efficiency autos	0.4	\$2.2 billion	900	10	\$22.0 billion	9,000
<i>Renewable energy</i>						
Wind energy	5.0	\$4.2 billion	21,000	10	\$42.0 billion	210,000
Solar energy	6.0	\$4.2 billion	25,200	10	\$42.0 billion	252,000
Geothermal energy	10.0	\$931.1 million	9,300	10	\$9.3 billion	93,000
Total		\$14.0 billion	77,300	10	\$140.0 billion	773,000

PENNSYLVANIA Infrastructure Investments through THRIVE Agenda

TABLE 3A: Infrastructure Investments: Job Creation—Direct, Indirect, and Induced Jobs

	Job Creation per \$1 Million in Spending			
	1) Direct Jobs	2) Indirect Jobs	3) Induced Jobs	4) Total Jobs
Surface transportation	11.1	1.4	2.9	15.4
Water/wastewater	5.2	1.7	2.8	9.7
Electricity	1.6	0.5	0.9	3.0
Airports	2.7	0.8	1.6	5.1
Inland waterways/marine ports	2.6	1.0	1.5	5.1
Dams	7.3	2.0	3.8	13.1
Hazardous and solid waste	5.8	2.0	3.1	10.9
Levees	7.4	1.9	3.6	12.9
Public parks and recreation	9.0	1.7	3.1	13.8
Rail	2.8	1.5	2.1	6.4
Schools	10.6	1.3	3.8	15.7
Gas distribution pipelines—leak repairs only	0.8	1.3	3.5	5.6
Broadband	1.6	1.2	1.8	4.6

TABLE 3B: Infrastructure Investments: Total Jobs Created with Budgetary Figures

	1) Total Jobs/ \$1 Million	Annual Job Creation		Job-Years Created, All Years		
		Annual Budget	Job Creation per Year	# of Years	Total Budget	Total Job Years
Surface transportation	15.4	\$4.3 billion	66,200	10	\$43.0 billion	662,000
Water/wastewater	9.7	\$1.2 billion	11,600	10	\$12.0 billion	116,000
Electricity	3.0	\$1.7 billion	5,100	10	\$17.0 billion	51,000
Airports	5.1	\$163.0 million	800	10	\$1.6 billion	8,000
Inland waterways/ marine ports	5.1	\$58.2 million	300	10	\$582.0 million	3,000
Dams	13.1	\$151.3 million	2,000	10	\$1.5 billion	20,000
Hazardous and solid waste	10.9	\$11.6 million	100	10	\$116.0 million	1,000
Levees	12.9	\$271.6 million	3,500	10	\$2.7 billion	35,000
Public parks and recreation	13.8	\$395.7 million	5,500	10	\$4.0 billion	55,000
Rail	6.4	\$810.9 million	5,200	10	\$8.1 billion	52,000
Schools	15.7	\$1.5 billion	23,500	10	\$15.0 billion	235,000
Gas distribution pipe- lines—leak repairs only	5.6	\$710.0 million	4,000	10	\$7.1 billion	40,000
Broadband	4.6	\$1.4 billion	6,400	10	\$14.0 billion	64,000
Total		\$12.7 billion	134,200	10	\$127.0 billion	1,342,000

PENNSYLVANIA Agriculture and Land Restoration Investments through THRIVE Agenda

TABLE 4A: Agriculture and Land Restoration Investments: Job Creation—*Direct, Indirect, and Induced Jobs*

	Job Creation per \$1 Million in Spending			
	1) Direct Jobs	2) Indirect Jobs	3) Induced Jobs	4) Total Jobs
<i>Agriculture</i>				
Regenerative agriculture	9.3	2.2	2.3	13.8
Farmland conservation	7.2	1.8	3.4	12.4
Organic farming	9.3	2.2	2.3	13.8
Resources for marginalized farmers	9.1	1.3	2.3	12.7
Agricultural R&D	6.1	1.9	2.9	10.9
<i>Land restoration</i>				
Pollution cleanup	6.4	1.8	3.3	11.5
Closing orphaned wells	0.9	1.3	3.6	5.8
Ecosystem restoration	10.2	1.7	3.3	15.2

TABLE 4B: Agriculture and Land Restoration Investments: *Total Jobs Created with Budgetary Figures*

	1) Total Jobs/ \$1 Million	Annual Job Creation		Job-Years Created, All Years		
		Annual Budget	Job Creation per Year	# of Years	Total Budget	Total Job Years
<i>Agriculture</i>						
Regenerative agriculture	13.8	\$1.6 billion	22,100	10	\$16.0 billion	221,000
Farmland conservation	12.4	\$1.0 billion	12,400	10	\$10.0 billion	124,000
Organic farming	13.8	\$58.2 million	800	10	\$582.0 million	8,000
Resources for marginalized farmers	12.7	\$3.5 billion	44,400	10	\$35.0 billion	444,000
Agricultural R&D	10.9	\$97.0 million	1,100	10	\$1.0 billion	11,000
<i>Land restoration</i>						
Pollution cleanup	11.5	\$488.9 million	5,600	10	\$4.9 billion	56,000
Closing orphaned wells	5.8	\$465.6 million	2,700	10	\$4.7 billion	27,000
Ecosystem restoration	15.2	\$38.8 million	600	10	\$388.0 million	6,000
Total		\$7.2 billion	89,700	10	\$72.0 billion	897,000

PENNSYLVANIA Care Economy, Public Health, and Postal Service Investments through THRIVE Agenda

**TABLE 5A: Care Economy, Public Health, and Postal Service Job Creation—
Direct, Indirect, and Induced Jobs**

	Job Creation per \$1 Million in Spending			
	1) Direct Jobs	2) Indirect Jobs	3) Induced Jobs	4) Total Jobs
Care economy	16.3	1.7	4.4	22.4
Public health	7.6	2.0	3.6	13.2
Postal service	7.0	0.9	3.6	11.5

**TABLE 5B: Care Economy, Public Health, and Postal Service Investments:
Total Jobs Created with Budgetary Figures**

	1) Total Jobs/ \$1 Million	Annual Job Creation		Job-Years Created, All Years		
		Annual Budget	Job Creation per Year	# of Years	Total Budget	Total Job Years
Care economy	22.4	\$3.0 billion	67,200	10	\$30.0 billion	672,000
Public health	13.2	\$174.6 million	2,300	10	\$1.7 billion	23,000
Postal service	11.5	\$97.0 million	1,100	10	\$1.0 billion	11,000
Total		\$3.3 billion	70,600	10	\$33.0 billion	706,000

TABLE 6: PENNSYLVANIA Job Creation Estimates through all THRIVE Agenda Investments

	Annual Budget and Job Creation Figures		Total Budget and Job-Years Figures	
	Annual Budget	Annual Job Creation	Total Budget	Total Job Creation, Job Years
Infrastructure investments	\$12.7 billion	134,200	\$127.0 billion	1,342,000
Clean energy investments	\$14.0 billion	77,300	\$140.0 billion	773,000
Agriculture and land restoration investments	\$7.2 billion	89,700	\$72.0 billion	897,000
Care economy, public health, and postal service investments	\$3.3 billion	70,600	\$33.0 billion	706,000
Total	\$37.2 billion	371,800	\$372.0 billion	3,718,000

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