

Three Year 2008-2011 Financial Bailout Spending Would Have Paid for Almost Thirty Years 2020-2050 of Global Climate Crisis Mitigation

March 1, 2019



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Abstract

This working paper demonstrates that the money created by the Fed for the three Year 2008-2011 financial bailout would have paid for almost thirty years 2020-2050 of global climate crisis mitigation. It also points out that Modern Monetary Theory thinking is useful for differentiating the easy to solve financial spending problem from the more difficult problems of economic resource reallocation and social equity, and that the amount of spending, taxing and rationing, necessary for each of these goals will likely be different.

Executive Summary

Modern Monetary Theory (MMT) facilitates a separation between three different requirements for implementing a large scale U.S. funded Green New Deal and Marshall Plan (GNDMP).¹

a) Raising the "cash" to pay for the program. MMT reminds that this can be easily done by lifting self-imposed institutional constraints (as has been done many times in the past) and having the Fed create it (Section I, points 1 and 2 below).

b) Creating enough real slack in the economy so that the real environmental and economic goals of the newly created spending are achieved rather than bottlenecks and inflation (Section I, point 3 below).

c) Taxing and rationing in ways that lift the burden of real economic transition on lower incomes and increase the burden on upper incomes and especially rentiers (Section I, point 4 below).

d) A rough estimate derived from the 2017 United Nations Environment Programme report suggests that global Green House Gas (GHG) atmospheric emissions will need to be reduced by 750 Giga Tons (GT) CO₂ equivalent (eq) over the 2020-2050 period to remain below the 2 degrees Celsius planetary warming trajectory (Section III, d) and Figure 1 below).

e) Summing up 56 of the 80 methods for GHG reduction for which Project Drawdown has estimated CO₂ GT eq reduction and costs for the 2020-2050 period gives a total estimated GHG reduction of 555.46 CO₂ eq GT at a cost of \$ 28.9 T (Section III, Figure 2 below). These 56 include only "supply side" reduction for methods with financial estimates. Critical "demand side" measures for reducing GHG emissions are not included in these figures (see discussion in Section III). From d) 555.46 CO₂ eq GT is 74.1%, or almost three quarters, of the 750 CO₂ eq GT necessary to remain below 2 degrees Celsius for the 2020 to 2050 period. The increase in investment, employment, and consumption, particularly in developing countries, from spending \$28.9 T would need to be offset by taxing the wealthy for global equity, and so that this spending would reduce net GHG emissions after taking into account increased emissions from induced employment and income growth for lower-income households (Section III, e) and Figure 2 below).

f) The most comprehensive estimate of the total amount of monetary "commitments" made by the Fed over 2008-2011 to bail-out global finance is \$ 29 T. Per e), this is less than the \$28.9 T cost of eliminating 74.1% of 2020-2050 GHG emissions required to remain below the critical 2 degrees Celsius threshold (Section III, f) below).

The Fed's three year 2008-2011 financial bailout spending could thus have "paid for" a global Green New Deal and Marshall Plan (GNDMP) that included these 56 drawdown methods estimated to reduce GHG emissions by almost three-quarters (74.1%) of the amount necessary to mitigate climate change

¹ For international trade related discussion of the benefits of a Global Marshall Plan see: "Unequal Exchange Without a Labor Theory of Prices: On the Need for a Global Marshall Plan and a Solidarity Trading Regime", Baiman, *Review of Radical of Political Economics*, Winter, 2006.

over the coming thirty years 2020-2050 without even including critical “demand side” GHG reduction measures.

Though “creating the money” to pay for a GNDMP is not the same as successively implementing the real economic changes necessary to implement a GNDMP, MMT reminds us that a) – c) are not at all the same goals. Raising the “cash” needed for a) may or may not provide the real economic slack needed for b) or the social, economic, and political equity needed for c). Therefore it's useful to separate out the “cash” question a) by directly monetizing public spending, and tax and ration with specific goals b) and c) in mind, per Abba Lerner's “functional finance” point. (Section II).

MMT is useful as probably 99% of politicians, and the general public, are still stuck in the “gold standard” money fetishism way of thinking that the government has to tax or borrow the “cash” it needs for its programs. MMT is a way of making this movement from “Newtonian Physics” gold standard economics to “Relativity” sovereign fiat money economics. This is a really important political point that goes beyond standard Keynesian deficit spending.

Finally, this is more than a difficult paradigm shift. Like many things in economics it is closely linked to politics and power. Unmasking the pretense that the government has to “borrow” its own money from the “private economy” unveils the enormous power that a federal government with a sovereign fiat currency, especially if it's the world reserve currency, can wield *for the global public good*, instead of just to bail out and pump up private finance as in 2008, and FIRE (Finance, Insurance, and Real Estate) more recently through QE (Quantitative Easing).

I. Important Modern Monetary Theory Points

1) In principle it is nonsensical to talk about the federal government needing to tax or sell bonds to “pay” for federal programs. The moment a government takes over the task of creating money (as the Bank of England first did in 1694) the government is already “borrowing” from everyone who holds the currency. The government redeems its “borrowing” by accepting its own currency as payment for taxes - at which point these IOUs from the Government to holders of the currency are expunged. Trust in the value of the currency (in the mostly “secondary” market where it's used) represents trust that others will value it. For a long time this trust was based on, at least the perception of, a promise by the Central Bank, or Fed, that these IOUs from the government could be redeemed for gold (that everyone trusted for historical reasons), but since the era of fiat money, trust in the currency is based on trust that everyone else will trust it, and that the government will accept it as “Legal Tender” for paying taxes.

2) In practice when the government spends, the Fed debits the Treasury's reserve account and credits the reserve accounts of the banks where the spending ends up (or elsewhere if spent outside the Fed system). As Kelton (formerly Bell) describes in great detail in her now classic paper “Do Taxes and Bonds Finance Government Spending” (JEI, 34 (4) Sep. 2000), there is almost always a mismatch between what's in the Treasury Reserve account and what the government is spending that is smoothed through

various institutional means by the Fed to maintain a stable Federal Funds rate target. The key point though is that if there are insufficient funds in the Treasury's reserve account from taxes or bond sales, the only obstacles to the Treasury selling Bonds directly to the Fed to raise the necessary funds are self-imposed institutional constraints that can and have been lifted numerous [times](#).² It appears that direct purchase is currently not authorized but in principle there is no reason why this constraint could not be lifted again, especially after the Fed has recently created trillions of dollars ex-nihilo [on QE "open market" purchases](#) of Treasuries, and Freddie, Fannie, and Ginnie mortgage backed securities.

3) The fact that MMT monetization of government spending (points 1) and 2)) is not particularly novel or original misses the important political effect of highlighting this possibility that has always existed and often been used, [in WWII for example](#). This is critical as it shifts the discussion of financing a Green New Deal and Marshall Plan (GNDMP), for example, to the *really important* issues of *real economic resource use* instead of the irrelevant "how do we pay it?" question. Thinking about the problem this way directs planning toward how to create enough *real slack* in the economy to accommodate the enormous amount of new government spending on investment and employment that such a program would require. As in WWII, such an expansion of real economic resource use will require offsetting reductions in consumer and other investment spending and production and probably direct rationing and price controls (as in WWII) to prevent unforeseen bottlenecks from leading to inflation instead of real resource reallocation. This means for example that simply taxing *extreme* income, wealth, and luxury production will not be adequate as it will be necessary to tax *a sizable enough share of upper income households and luxury goods* so as to achieve sufficient real reductions in production and use of these kinds of goods and services to accommodate public GNDMP spending and investment.

4) I find Michael Hudson's (whom I believe counts himself as being in the MMT camp) "Neo-Rentierist" approach most interesting.³ Per point 3), the objective for taxing rentiers would be to reduce the parasitic burden that they place on especially lower income and wealth households and real production, in order to eliminate or at least reduce the sacrifices in access to goods and services that these households and production may have to make in a GNDMP transition toward a more equitable and democratic economy and society. Broad improvements in distributional equity and production efficiency will for obvious reasons make a GNDMP transition less painful, more feasible, and more equitable.

II. Why the "How Do You Pay for it?" Question is Irrelevant

In discussions of points 1)-4) above, I was asked the following question:

² Note for non-economists: Technically when the Federal Reserve buys Treasury Bills directly from the Treasury, the Treasury is "borrowing" money from the Fed. However, since all of the interest on T-Bills held by the Fed, minus a negligible amount for Fed overhead, goes back to the Treasury, this "debt" to the Fed never has to be paid back. It is therefore not really "debt" but simply money creation for the Treasury by the Fed, or direct "monetization" of government spending.

³ *The Bubble and Beyond* and *Killing the Host* (2012, 2015, Dresden: ISLET-Verlag).

It stuns me that a political economist would dismiss this question as “irrelevant.” The allocation of social resources is a trivial question?

My answer:

I think the “how do you pay for it” question can be described as “irrelevant” in the sense that it does not address the truly relevant and important question that I think you are asking.

You're referring to the first part of point 3) above:

"The fact that MMT monetization of government spending (points 1) and 2)) is not particularly novel or original misses the important political effect of highlighting this possibility that has always existed and often been used, in WWII for example. This is critical as it shifts the discussion of financing a Green New Deal and Marshall Plan (GNDMP), for example, to the really important issues of real economic resource use instead of the irrelevant “how do we pay for it?” question. Thinking about the problem this way directs planning toward how to create enough real slack in the economy to accommodate the enormous amount of new government spending on investment and employment that such a program would require."

MMT has reminded us that a Government with a sovereign fiat currency can always "pay" for whatever it wants to (as the Fed has been reminding us with the 2008 bail-out and QE), if necessary by lifting self-imposed constraints that have been lifted numerous times before as noted in point 2. *So the literal "payments" can be easily made by the Fed with a click of the keyboard to create the money "to pay for it". In this sense the question of "how to pay" is "irrelevant" as it is not the critical issue.*

The question that I think you're raising regarding the allocation of *real* social resources relates to rest of point 3), i.e. *will the payments achieve the reallocations that they're meant to bring about or bottlenecks and inflation? This is indeed THE question that is obfuscated by the easy to solve question of "how do we pay for it?"*

The rest of point 3) attempts to directly address this:

"As in WWII, such an expansion of real economic resource use will require offsetting reductions in consumer and other investment spending and production and probably direct rationing and price controls (as in WWII) to prevent unforeseen bottlenecks from leading to inflation instead of real resource reallocation. This means for example that simply taxing extreme income, wealth, and luxury production will not be adequate as it will be necessary to tax a sizable enough share of upper income households and luxury goods so as to achieve sufficient real reductions in production and use of these kinds of goods and services to accommodate public GNDMP spending and investment."

Point 4) and the reference to Hudson attempt to include the other aspect of your question, the economic power and social justice effects of social resource allocation not addressed in point 3) that primarily addresses real economic capacity. As many have pointed out, the demand side of GHG emissions is

clinked to income distribution as about half of Green House Gas (GHG) emissions come from the upper 10% of the world's population by income.⁴

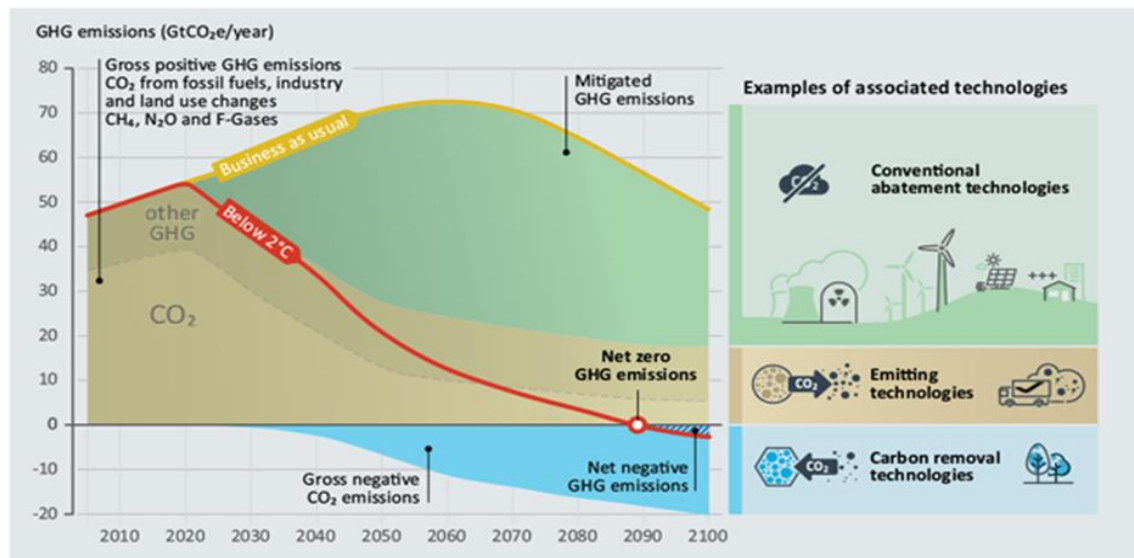
III. Three Year 2008-2011 Financial Bailout Spending Would Have Paid for Almost Thirty Years 2020-2050 of Global Climate Crisis Mitigation

As a world fiat currency, U.S. public money power could also be applied on a world scale to what is after all, a human and planetary existential crisis, and not just a U.S. one.

d) Figure 1 below from the 2017 United National Environment Programme report suggests that a roughly 750 GT of CO₂ eq GHG atmospheric emissions reduction is necessary to get below the critical 2 degree Celsius global warming threshold over 2020-2050.⁵

Figure 1: Green House Gas Emissions and Average Global Temperatures

The role of carbon dioxide removal in climate change mitigation



Note: This figure shows emission reductions from conventional mitigation technologies combined with carbon dioxide removal. This exemplary scenario is consistent with an at least 66 percent chance of keeping warming below 2°C relative to pre-industrial levels. Emission reductions are shown against a business-as-usual scenario without any additional climate policies. Global net emissions levels turn to net negative towards the very end of the century, but carbon dioxide removal is already being deployed much earlier. Some residual greenhouse gas emissions remain at the end of the century, as they are too difficult to mitigate in the scenario. Note that the scenario used is different from the scenarios used in Chapter 3, which leads to small variations in emission levels and timing of negative emissions.

Source: *The Emissions Gap Report 2017*. UNEP.

⁴ For example, from an 10/9/2019 interview on *Democracy*:

“KEVIN ANDERSON: Well, just to put some numbers on this, about half of global emissions arise from the activities of just about 10 percent of the world's population, and about 70 percent of all global emissions of carbon dioxide come from about 20 percent of the world's population. And very closely, the emissions relate to the wealth or the income of the citizens.”

Kevin Anderson is a professor at the UK's premier climate modeling institution, the Tyndall Centre, and the University of Manchester. I thank Gene Coyle for alerting me to this point and supplying this reference.

⁵ This estimate is based on using Figure 1 to approximate emissions at 55 CO₂ eq. GT in 2020 and 20 CO₂ eq. GT in 2050 on the red “Below 2 degrees C” curve, 70 CO₂ eq. GT in 2050 on the “Business as Usual” yellow curve, and based on these estimates calculating the area of the triangle with base (70-20=50) and height (2050-2020=30) to get a total of 50x30/2= 750 CO₂ eq. GT reduction needed to be “Below 2 degrees C” from 2020 to 2050.

e) Figure 2 below includes calculations based on estimates produced by “[Project Drawdown](#)” for 56 of the 80 methods for planetary GHG emissions drawdown for which global financial cost, and (for 53 of these) financial net savings, estimates have been produced. The last row of the last three columns of Figure 2 show cumulative: CO2 eq reduction 555.46 (GT), Total Cost \$28,881.56 (Billions US), and Total Net Savings \$68,137.12 (Billions US). The methods by which these costs and net savings estimates have been calculated could presumably serve as a basis for a “Green New Deal and Marshall Plan” (GNDMP) spending plan for 2020-2050. As this would occur over a 30 year period the “spending” would be cumulative but revolving and include return payments and rollovers of loans, credits, and guarantees, and new loans, credits and guarantees, that would be issued over this period of time to support the GNDMP. As in the case of the global financial bailout accounting below, return payments are *not* deducted from the cost estimates. In the Project Drawdown estimates they would presumably come out of the estimated “Net Savings”. Moreover, per point 4) above, for direct equity and efficiency reasons, and in order to most effectively reduce demand driven GHG emissions, U.S. demands for pay-backs should be tilted (like Marshall Plan Policies stipulating land reform and break-up of industrial monopolies) in a progressive direction toward taxing high income, wealth, and generally unproductive monopolistic rentier sectors like the “Finance, Insurance, and Real Estate” (FIRE) sector.

f) The most comprehensive [estimate](#) of the total amount of monetary “commitments”, including revolving cumulative lending, guarantees, and spending made by the Fed over 2008-2011 to bail-out global finance is \$ 29 T or roughly the same as the \$ 28.9 T estimate above for the total amount of “cash” needed to pay to reduce GHG emissions by 555.46 CO2 eq. GT or 74.1% of the 750 CO2 eq. GT needed keep average global temperatures from rising by more than 2 degrees Celsius over the 2020-2050 period. Note that this GNDMP spending estimate also results in a \$68.1 T net savings estimate and a much longer 30 year “roll-over” period for the spending than the roughly 3 year 2008-2011 period for the \$ 29 T global financial bail-out estimate.⁶

Per Section I a)-c) and Section II, spending alone will not produce a GNDMP. The increase (or decrease, if net financial savings resulted in job and income losses) in investment, employment, income, and consumption, particularly in developing countries, from GNDMP spending would need to be offset by taxing the wealthy (to create slack or more jobs) for global equity and so that this spending will result in reallocation and creation of *real* economic capacity to reduce net GHG emissions and not just bottlenecks and unsustainable inflation. The 56 Project Drawdown projects summed up in Figure 2 not only exclude highly ranked methods for which cost and savings estimates are not available, but also family planning and other population growth reduction measures and most importantly other critically important GHG *demand side* reductions from income and wealth *redistribution*.

As is noted above, about half of global GHG emissions come from the consumption of the upper 10% of income earners and about 70% of GHG emissions come from the upper 20%.⁷ So, as noted directly above and in point 4), the effectiveness of the GNDMP will also depend on the extent to which it redistributes most of the benefits of green economic transition toward lower income and wealth

⁶ There is abundant evidence that the Fed’s largesse was not just used to bail-out nominally U.S. (with global exposure) financial institutions, but also directly and indirectly through “counter-party” bailouts, “foreign” financial institutions (Hudson, *Killing the Host* (2015, Dresden: ISLET-Verlag).

⁷ Op. cit. footnote 4.

households and productive sectors, and places most of the burdens of the transition on the wealthy and rentier sectors. In this sense the GNDMP would be a complete reversal of the Neoliberal International Monetary, World Bank, and Federal Reserve policies of the last few decades.

The question before us may thus be framed in a nutshell. Are modern civilization and species survival more important than the Neoliberal order, and global finance and Neo-rentierism?⁸

⁸ For more on Neo-Rentierism and the roles of FIRE, platform monopolies, big pharma, health insurance, and other monopolistic sectors, see Hudson op. cit. footnote 3, and Baiman 2018: https://www.researchgate.net/publication/325069847_Shaikh's_Classical-Keynesian_Political_Economy_Unequal_Exchange_and_Facebook

Figure 2: Cumulative Green House Gas Reduction and Cost and Net Savings Estimates 2020-2050

	Economic or Social Sector Impacted	Total Atmospheric CO2 eq Reduction (GT)	Net Costs (Billions U. \$)	Savings (Billions U.S. \$)	Methods Included in Co2 eq Reduction and Cost Totals	Cumulative CO2 eq Reduction for Methods with Cost Estimates (GT)	Cumulative Net Costs for Methods with Cost Estimates (Billions US \$)	Cumulative Savings for Methods with Savings Estimates (Billions US \$)
1	Refrigerant Management	89.74	N/A	(\$902.77)				
2	Wind Turbines (Onshore)	84.6	\$1,225.37	\$7,425.00	1	84.6	\$1,225.37	\$7,425.00
3	Reduced Food Waste	70.53	N/A	N/A				
4	Plant-Rich Diet	66.11	N/A	N/A				
5	Tropical Forests	61.23	N/A	N/A				
6	Educating Girls	51.48	N/A	N/A				
7	Family Planning	51.48	N/A	N/A				
8	Solar Farms	36.9	(\$80.60)	\$5,023.84	2	121.5	\$1,144.77	\$12,448.84
9	Silvopasture	31.19	\$41.59	\$699.37	3	152.69	\$1,186.36	\$13,148.21
10	Rooftop Solar	24.6	\$453.14	\$3,457.63	4	177.29	\$1,639.50	\$16,605.84
11	Regenerative Agriculture	23.15	\$57.22	\$1,928.10	5	200.44	\$1,696.72	\$18,533.94
12	Temperate Forests	22.61	N/A	N/A				
13	Peatlands	21.57	N/A	N/A				
14	Tropical Staple Trees	20.19	\$120.07	\$626.97	6	220.63	\$1,816.79	\$19,160.91
15	Afforestation	18.06	\$29.44	\$392.33	7	238.69	\$1,846.23	\$19,553.24
16	Conservation Agriculture	17.35	\$37.53	\$2,119.07	8	256.04	\$1,883.76	\$21,672.31
17	Tree Intercropping	17.2	\$146.99	\$22.10	9	273.24	\$2,030.75	\$21,694.41
18	Geothermal	16.6	(\$155.48)	\$1,024.34	10	289.84	\$1,875.27	\$22,718.75
19	Managed Grazing	16.34	\$50.48	\$735.27	11	306.18	\$1,925.75	\$23,454.02
20	Nuclear	16.09	\$0.88	\$1,713.40	12	322.27	\$1,926.63	\$25,167.42
21	Clean Cookstoves	15.81	\$72.16	\$166.28	13	338.08	\$1,998.79	\$25,333.70
22	Wind Turbines (Offshore)	14.1	\$545.30	\$762.50	14	352.18	\$2,544.09	\$26,096.20
23	Farmland Restoration	14.08	\$72.24	\$1,342.47	15	366.26	\$2,616.33	\$27,438.67
24	Improved Rice Cultivation	11.34	N/A	\$519.06				
25	Concentrated Solar	10.9	\$1,319.70	\$413.85	16	377.16	\$3,936.03	\$27,852.52
26	Electric Vehicles	10.8	\$14,148.00	\$9,726.40	17	387.96	\$18,084.03	\$37,578.92
27	District Heating	9.38	\$457.10	\$3,543.50	18	397.34	\$18,541.13	\$41,122.42
28	Multistrata Agroforestry	9.28	\$26.76	\$709.75	19	406.62	\$18,567.89	\$41,832.17
29	Wave and Tidal	9.2	\$411.84	(\$1,004.70)	20	415.82	\$18,979.73	\$40,827.47
30	Methane Digesters (Large)	8.4	\$201.41	\$148.83	21	424.22	\$19,181.14	\$40,976.30
31	Insulation	8.27	\$3,655.92	\$2,513.33	22	432.49	\$22,837.06	\$43,489.63
32	Ships	7.87	\$915.93	\$424.38	23	440.36	\$23,752.99	\$43,914.01
33	LED Lighting (Household)	7.81	\$323.52	\$1,729.54	24	448.17	\$24,076.51	\$45,643.55
34	Biomass	7.5	\$402.31	\$519.35	25	455.67	\$24,478.82	\$46,162.90
35	Bamboo	7.22	\$23.79	\$264.80	26	462.89	\$24,502.61	\$46,427.70
36	Alternative Cement	6.69	(\$273.90)	N/A	27	469.58	\$24,228.71	
37	Mass Transit	6.57	N/A	\$2,379.73				
38	Forest Protection	6.2	N/A	N/A				
39	Indigenous Peoples' Land Manag	6.19	N/A	N/A				
40	Trucks	6.18	\$543.54	\$2,781.63	28	475.76	\$24,772.25	\$49,209.33
41	Solar Water	6.08	\$2.99	\$773.65	29	481.84	\$24,775.24	\$49,982.98
42	Heat Pumps	5.2	\$118.71	\$1,546.66	30	487.04	\$24,893.95	\$51,529.64
43	Airplanes	5.05	\$662.42	\$3,187.80	31	492.09	\$25,556.37	\$54,717.44
44	LED Lighting (Commercial)	5.04	(\$205.05)	\$1,089.63	32	497.13	\$25,351.32	\$55,807.07
45	Building Automation	4.62	\$68.12	\$880.55	33	501.75	\$25,419.44	\$56,687.62
46	Water Saving - Home	4.61	\$72.44	\$1,800.12	34	506.36	\$25,491.88	\$58,487.74
47	Bioplastic	4.3	\$19.15	N/A	35	510.66	\$25,511.03	
48	In-Stream Hydro	4	\$202.53	\$568.36	35	514.66	\$25,713.56	\$59,056.10
49	Cars	4	(\$598.69)	\$1,761.72	36	518.66	\$25,114.87	\$60,817.82
50	Cogeneration	3.97	\$279.25	\$566.93	37	522.63	\$25,394.12	\$61,384.75
51	Perennial Biomass	3.33	\$77.94	\$541.89	38	525.96	\$25,472.06	\$61,926.64
52	Coastal Wetlands	3.19	N/A	N/A				
53	System of Rice Intensification	3.13	N/A	\$677.83				
54	Walkable Cities	2.92	N/A	\$3,278.24				
55	Household Recycling	2.77	\$366.92	\$71.13	39	528.73	\$25,838.98	\$61,997.77
56	Industrial Recycling	2.77	\$366.92	\$71.13	40	531.5	\$26,205.90	\$62,068.90
57	Smart Thermostats	2.62	\$74.16	\$640.10	41	534.12	\$26,280.06	\$62,709.00
58	Landfill Methane	2.5	(\$1.82)	\$67.57	42	536.62	\$26,278.24	\$62,776.57
59	Bike Infrastructure	2.31	(\$2,026.97)	\$400.47	43	538.93	\$24,251.27	\$63,177.04
60	Composting	2.28	(\$63.72)	(\$60.82)	44	541.21	\$24,187.55	\$63,116.22
61	Smart Glass	2.19	\$932.30	\$325.10	45	543.4	\$25,119.85	\$63,441.32
62	Women Smallholders	2.06	N/A	\$87.60				
63	Telepresence	1.99	\$127.72	\$1,310.59	46	545.39	\$25,247.57	\$64,751.91
64	Methane Digesters (Small)	1.9	\$15.50	\$13.90	47	547.29	\$25,263.07	\$64,765.81
65	Nutrient Management	1.81	N/A	\$102.32				
66	High-speed Rail	1.52	\$1,038.42	\$368.10	48	548.81	\$26,301.49	\$65,236.23
67	Farmland Irrigation	1.33	\$216.16	\$429.67	49	550.14	\$26,517.65	\$65,665.90
68	Waste-to-Energy	1.1	\$36.00	\$19.82	50	551.24	\$26,337.49	\$65,685.72
69	Electric Bikes	0.96	\$106.75	\$226.07	51	552.2	\$26,624.40	\$65,911.79
70	Recycled Paper	0.9	\$573.48	N/A	52	553.1	\$26,910.97	
71	Water Distribution	0.87	\$137.37	\$903.11	53	553.97	\$27,048.34	\$66,814.90
72	Biochar	0.81	N/A	N/A				
73	Green Roofs	0.77	\$1,393.29	\$988.46	54	554.74	\$28,036.80	\$67,803.36
74	Trains	0.52	\$808.64	\$313.86	55	555.26	\$28,845.44	\$68,117.22
75	Ridesharing	0.32	N/A	\$185.56				
76	Micro Wind	0.2	\$36.12	\$19.90	56	555.46	\$28,881.56	\$68,137.12
77	Energy Storage (Distributed)	N/A	N/A	N/A				
77	Energy Storage (Utilities)	N/A	N/A	N/A				
77	Grid Flexibility	N/A	N/A	N/A				
78	Microgrids	N/A	N/A	N/A				
79	Net Zero Buildings	N/A	N/A	N/A				
80	Retrofitting	N/A	N/A	N/A				