



A GREEN NEW DEAL FOR K-12 PUBLIC SCHOOLS: EXPLAINER

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EXPLAINER

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A Green New Deal for K–12 Public Schools addresses long-term issues of health and environmental inequity, educational inequity, economic inequity, and structural racism by offering equitable goals, priorities, and \$1.4 trillion in funding for our K–12 schools through federal Climate Capital Facilities Grants, Resource Block Grants, and expansion in Title I funding over the next decade.

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A Green New Deal for K–12 Public Schools addresses long-term issues of health and environmental inequity, educational inequity, economic inequity, and structural racism by offering equitable goals, priorities, and \$1.4 trillion in funding for our K–12 schools through federal Climate Capital Facilities Grants, Resource Block Grants, and expansion in Title I funding over the next decade.

To achieve a Green New Deal for K–12 Public Schools, we propose \$1.4 trillion in new funding over 10 years that would direct:

- **\$446 billion over 10 years for Climate Capital Facilities Grants** to fund healthy, green, climate-friendly retrofits. These grants would be paired with an additional \$223 billion in low-interest loans to deliver healthy, green retrofits to all K–12 public schools. Grant funding would be targeted to school districts in the lowest-income areas, which will be prioritized for first access to funds in the program’s first three years. These retrofits will also include short-term measures to help schools reopen safely as we exit the pandemic. An additional **\$40 billion will be made available, over 10 years, for school resiliency measures**, to fund additional green upgrades to schools to keep them safe in extreme weather and contribute to community resiliency.
- **\$250 billion over 10 years for Resource Block Grants** to fund expanded staff, social services, training, and professional development in public schools with the greatest need; this would include \$100 million in Educational Equity Planning Grants to pilot a process of eliminating intra-region education inequities in school funding.
- **\$66 billion annually in expanded Title I and IDEA Annual Funding** to sustain operational support for the Resource Block Grants.

The Green New Deal for K–12 Public Schools is also a jobs program: in addition to the annual 935,000 jobs per year (of which 272,000 are construction and on-site maintenance jobs) generated by the \$669 billion in green retrofits (of which \$446 billion are in the form of direct grants), new builds, and infrastructure, the bill is also creating and supporting 339,000 educator resource jobs generated by the \$250 billion in resource block grants. Overall, this bill will fund 1.3 million jobs annually.

We estimate that retrofitting all the country's K–12 public schools would cost \$669 billion. This would also cover community green infrastructure improvements like school-site solar and battery, as well as community involvement throughout the retrofit process. **We recommend that the federal government cover two thirds of this upfront cost—\$446 billion—through Climate Capital Facilities Grants, with the final third coming from low- and no-interest loans from the Department of Energy or Department of Education, as these retrofits should cut most annual utility bills by well over 50 percent. Schools in the most vulnerable third of census tracts should have their retrofits entirely funded by grants, and would be prioritized for funding in the program's first three years.** Overall, to comply with President Biden's executive orders on environmental justice,¹ we recommend that retrofits for schools in the most vulnerable third of census tracts be entirely grant-funded, that schools in the middle third have two thirds of retrofit costs covered by grants, and that schools in the richest third of census tracts have one third of their retrofit cost covered by grants. We use the CDC's Social Vulnerability index to measure vulnerability.

Healthy, green retrofits to all the country's K–12 public schools would create 935,000 jobs per year across the economy. Of those, we estimate that 272,000 jobs would be on-site maintenance and construction jobs compensated at union rates. Our estimate of projected place-based spending, based on our proposal's equity criteria, finds that on-site construction and maintenance jobs would be evenly distributed between red states and blue states (based on 2020 electoral college vote), with 137,000 going to blue states and 132,000 to red states, plus 3,000 to Puerto Rico. In Table 1, we provide a state-by-state breakdown of the nearly 272,000 new construction and on-site maintenance jobs generated by this capital investment over the next decade.

The Resource Block Grants will establish well-resourced classrooms and school facilities across the country while creating 339,000 new, good-paying jobs in schools. In schools with the greatest needs and that serve low-wealth students, these block grants can be used to support hiring more educators, lowering teacher-student ratios to 1:12 for K–8 schools and 1:15 for grade 9–12 schools. We will reach these ratios by hiring additional classroom teachers (a head and associate teacher for all pre-K–grade 3 classrooms) as well as learning specialists, including math and reading specialists and afterschool staff, for all pre-K–grade 12 classrooms. Research suggests that higher salaries and greater resources in classrooms and schools are vital to teacher retention and improving student educational outcomes.² These grants can also be used to build up and diversify the pipeline of educators and paraprofessionals trained in trauma-informed teaching and learning practices.

The country's 105,000 K–12 schools currently emit 78 million metric tons of CO₂ each year;³ they use 8 percent of all the energy used by US buildings.⁴ Decarbonizing the country's K–12 schools would entirely eliminate that carbon pollution, the equivalent of taking 17 million cars off the road. School energy use can be fully decarbonized by performing deep-energy retrofits for school buildings, adding solar panels to school facilities, and switching to zero-carbon energy sources for any remaining electricity needs. And electrification will have local health benefits, by eliminating toxic fumes from in-building combustion of gas, oil, and/or propane. To date, schools have been constrained in making truly healthy, deep-energy retrofits because of high upfront costs. We propose using federal investment to cover schools' full retrofit cost. For schools in the lowest income third of census tracts, we propose full grant funding for retrofits. Better-funded schools would receive a mix of federal grants and federal loans. **Overall, this massive federal investment in schools will drive down the cost of deep energy retrofits for the entire building sector, by creating and growing businesses, building workers' capabilities, and lowering costs for technologies and materials. This would help advance racial justice while healing the planet—and schools' balance sheets.⁵**

TABLE 1

ANNUAL ON-SITE CONSTRUCTION AND MAINTENANCE JOBS FROM \$669 BILLION INVESTED INTO PUBLIC SCHOOL GREEN RETROFITS

STATE + TERRITORY	JOBS	STATE + TERRITORY	JOBS
Alabama	4,820	Montana	1,000
Alaska	2,070	Nebraska	1,260
Arizona	9,260	Nevada	2,580
Arkansas	3,750	New Hampshire	190
California	38,960	New Jersey	4,840
Colorado	3,290	New Mexico	4,460
Connecticut	1,750	New York	13,000
Delaware	570	North Carolina	9,240
District of Columbia	960	North Dakota	420
Florida	15,360	Ohio	7,140
Georgia	7,840	Oklahoma	6,240
Hawaii	690	Oregon	3,690
Idaho	1,540	Pennsylvania	4,220
Illinois	9,260	Rhode Island	750
Indiana	3,550	South Carolina	4,610
Iowa	1,130	South Dakota	1,000
Kansas	1,870	Tennessee	5,440
Kentucky	4,940	Texas	37,220
Louisiana	5,570	Utah	1,330
Maine	710	Vermont	200
Maryland	2,200	Virginia	3,420
Massachusetts	2,770	Washington	5,900
Michigan	8,380	West Virginia	1,510
Minnesota	4,090	Wisconsin	2,770
Mississippi	5,180	Wyoming	310
Missouri	5,630	Puerto Rico	2,960
		Total	272,000

METHODOLOGY

ESTIMATING RETROFIT COSTS

Healthy, green, carbon-neutral retrofits will likely incur a gross capital cost of between \$15/sq.ft. and \$600/sq.ft., including conventional capital repairs and greening, depending on the needs of a particular school. Our facilities grants should also cover the costs of solar and battery installation. We have estimated a median cost of \$85/sq.ft., inclusive of all these measures. In our discussions with officials currently engaged in deep green retrofit processes in California, we have examined data, not yet public, with whole building retrofits costing substantially less and substantially more than our projected median cost. We also recognize that some schools will require 5–10 times the median amount, based on local conditions like building age and historic levels of (under-)investment.

In Philadelphia, for instance, one of the country's most neglected school districts, a recent study estimated that the district's schools needed renovations with an upfront cost of nearly \$5 billion, averaging over \$500/sq.ft.⁶ That report focused on health needs; but the vast majority of projected repair costs concerned windows and HVAC—precisely the systems that a deep energy retrofit would replace. For crumbling schools with broken energy systems, a healthy, green, deep energy retrofit would only cost marginally more than a conventional retrofit, as building system replacement and repair is already needed. But in the process, a healthy, green, deep energy retrofit would be using the most modern, advanced building systems, instead of saddling schools with high-energy, near-obsolete alternatives. With the federal government covering the entire upfront cost for low-income schools, the savings from dramatically lower utility bills, coupled with earnings from on-site solar wherever feasible, will provide massive financial benefits for school districts.

To estimate the costs for this program, we looked at data on existing schools, case studies of school retrofits, and research on deep energy retrofits of commercial buildings. We currently lack detailed estimates of the cost of a deep energy, whole building retrofit for a wide variety of US schools. Most case studies of school retrofits involve minor or moderate energy efficiency programs, with ambition capped at reducing energy use by up to one third.⁷ As described above, studies of commercial buildings' experiences with such retrofits find enormous variation in costs, from \$5/sq.ft. to over \$200 in rare cases.⁸ The most expensive case study we found for a deep energy retrofit to a K–12 school was a project to renovate over 100 schools in Orange County Unified School District, at a cost of \$22.7 million, or \$22/sq.ft. The project yielded annual energy

savings of over \$680,000 per year.⁹ These retrofits included comprehensive HVAC upgrades, albeit not wholesale building transformations of the kind proposed here. Nor did that school district address the kind of toxin abatement needs present in Philadelphia. Research finds that higher upfront investments in deep energy retrofits are needed to deliver improved, longer-lasting results in slashing energy use.¹⁰

With an average school having 75,000 square feet,¹¹ and roughly 105,000 schools covered by this bill, and an average retrofit cost of \$85/square foot, we have estimated a total cost of \$669 billion, of which we recommend two thirds—\$446 billion—should be covered by direct grants, and the rest—\$223 billion—by no- and low-cost loans from the federal government. We urge that grants cover the entire cost for the poorest third of schools, two thirds of costs for the middle third of schools, and one third of costs for the richest third of schools. Grant allocation to states, territories, and tribes should be based in part on local climate, a major determinant of building energy needs—and thus retrofit cost.

JOB CREATION FROM FACILITIES UPGRADES

Overall estimates for job creation for facilities retrofits reflect total expected jobs, based on \$446 billion in grants and \$223 in loans (a total of \$669 billion in investment) for healthy, green, energy-efficient retrofits, over the course of ten years. This includes jobs directly created by the spending, indirect jobs in industries supplying intermediate goods such as building materials, and induced jobs from these newly hired workers spending money into the economy.

Jobs estimates were generated from an Input-Output model with multipliers derived by the Employment Policy Institute from Bureau of Labor Statistics data. The Bill-of-Goods method was used to generate jobs, which is the preferred method for using input-output modeling to estimate the impact of construction spending. On-site construction jobs were generated from the estimated proportion of the \$669 billion going directly to the sector from the school retrofit grants.

The Bill-of-Goods method for Input-Output modeling requires a breakdown of spending across sectors of the economy, so that appropriate multipliers can be applied to each segment of the spending. The allocation used here was created from engineering reports and studies of green retrofits for schools and other large buildings, and we checked against other work on using Input-Output models to estimate the impacts of green retrofits.

JOB CREATION FROM HUMAN RESOURCE INVESTMENTS

Teacher staffing needs were estimated from National Center for Education Statistics data.¹² We estimate that the proposed Resource Block Grants, supplemented by Title I, will cover salary needs for new staff. The block grants alone provide over \$70,000 per year per additional staffer (at our estimate of 339,000 new staff). The School-level Membership and Staff tables for 2018–2019 were joined to get student counts from the Membership table and teacher counts from the Staff table. Schools were removed from the table if they were missing values for number of students or teachers or showed only one or fewer students or teachers at the school. Upper outliers, which showed student-to-teacher ratios above 100, were also trimmed. Many of these upper outliers were schools and learning programs that offered education other than full-time, in-person education for K–12 students. Trimming these outliers brought down the number of schools in our “target universe” from 33,488 to 30,660 schools.

Target student-to-staff ratios were 12:1 for grades K–8 and 15:1 for grades 9–12. Target ratios for each school were calculated as the weighted average of these ratios, where weights were the number of students in each grade range at each school. Students in unmarked or unspecified grade levels were included and given a 15:1 target ratio.

Additional staff needed for each school were calculated based on the difference between the existing and the target student-to-teacher ratio. National staffing needs were the total across all schools, after an inflation ratio was applied to account for schools for which data was missing. New staffing needs in these missing rows was assumed to be the average of those at schools with better data when calculating national averages.

EMISSIONS REDUCTIONS

Estimates for CO₂e emission reductions are based on analysis of the 2012 Commercial Buildings Energy Consumption Survey, from the US Energy Information Administration. This survey provided an estimate for total energy consumption by source for all education buildings (Table C1).¹³ The energy-use breakdown by source (Table C1)¹³ for all Education buildings was scaled to the energy used by K-12 buildings (Table PBA3),¹⁴ to estimate the energy used by source for all K-12 buildings.

This method does not account for methane leakages in gas infrastructure, as the EPA does not yet provide standardized estimates. But it is virtually certain that full electrification represents significant savings on this front as well. Carbon conversion factors from the EPA¹⁵ were then applied to energy consumption by fuel type to yield the estimate for carbon savings.

ENDNOTES

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