

Cost Effective Solutions for Climate Change in the City of Cincinnati

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The Green Cincinnati Plan

In 2008 the City of Cincinnati produced its first ever carbon reduction action plan which has been updated every 5 years. This plan is made up of more than 20 goals on how to make Cincinnati a more sustainable city and more than 80 recommendations on how to best achieve those goals.



<https://www.cincinnati-oh.gov/oes/citywide-efforts/climate-protection-green-cincinnati-plan/>

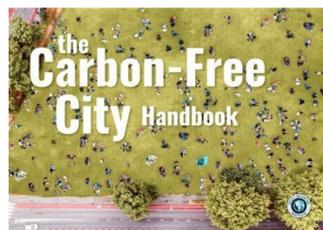
Xavier's Role in the GCP Update:

Our class worked to calculate \$/mega-ton of carbon reduction and mega-ton of carbon reduction/\$ calculations for half of the recommendations. Specifically, we were focused on the Transportation, Food, Waste, and Education & Outreach chapters of the plan.

Why Does it Matter?

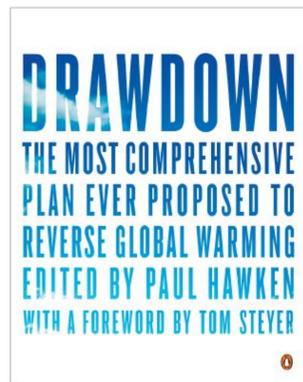
Determining which recommendations produce the largest carbon reduction for the least amount of money will help city leaders to identify which recommendations they should be prioritizing.

<https://www.rmi.org/carbonfreecities>



Background and Research

Our research utilizes two primary resources as points of comparison for our work. The First, *Drawdown*, is a compilation of research by leading climate scientists designed to promote the most effective global warming solutions. This information is less focused on combining environmental effectiveness with financial workability on a city level. Second, this research worked with "The Carbon Free City Handbook", a proposition of climate change solutions for the city level, providing insight into our project scale.



<http://www.drawdown.org>

Methods and Data

Category	Number	cost (\$)	5 yr. emission reduction (mtCO2e)	(\$/emissions)	(emissions/\$)
Food	1	TBD	TBD	TBD	TBD
Food	2 (3 year)	322,000	NA	NA	NA
Food	3	60,000	480	125.00	0.01
Food	4	8,550,000	NA	NA	NA
Food	5	284,000	11,200	25.36	0.04
Food	6	12,500	5,250	2.38	0.42
Food	7	6489	NA	NA	NA
Food	8	TBD	NA	NA	NA
Transportation	1	\$200,000.0	1340	149.25	0.01
Transportation	2	175,000	2686	65.15	0.02
Transportation	3	TBD	72135	TBD	TBD
Transportation	4	0	1850	0.00	NA
Transportation	5	250000	2033	122.97	0.01
Transportation	6	667000000	2482	268734.89	0.00
Transportation	7	15000	2350	6.38	0.16
Transportation	8	1000000	2033	491.88	0.00
Education	1	10,000,000	9,500	1052.63	0.00
Education	2	40,000	960	41.67	0.02
Education	3	25,000	NA	NA	NA
Education	4	25,000	NA	NA	NA
Education	5	44,500	NA	NA	NA
Education	6	32,000	NA	NA	NA
Education	7	NA	NA	NA	NA
Education	8	50,000	NA	NA	NA
Waste	1	65,000,000	41,649	1560.66	0.00
Waste	2a	1,100,000	42,070	26.15	0.04
Waste	2b	NA	19,609	NA	NA
Waste	3	Nominal	21,348	NA	NA
Waste	4	1,030,000	21,348	48.25	0.02
Waste	5	166,000	6,161	26.94	0.04
Waste	6	0	4,485	NA	NA
Waste	7	576,000	1,232	467.53	0.00
Waste	8a	Nominal	70.3	NA	NA
Waste	8b	Nominal	104.9	NA	NA
Waste	9	100,000	55.6	1798.56	0.00
Waste	10	NA	8.61	NA	NA
Waste	11	0	NA	NA	NA

The methods used for the varying proposals, were calculated from a Xavier economics class, as well as a University of Cincinnati Environmental Engineering class helped to research to find data and calculate emissions and costs to establish a basis for the amount of carbon reduction and estimated costs of projects to reduce Cincinnati's carbon footprint. The "To Be Determined" sections are the areas where cost and true impact can vary greatly depending on the effectiveness or how it is handled. Many of the educational sections shown can only be this way for it is how people use the educational programs that will be the impact. The set data is a variable estimate that can help us estimate which proposal is the most effective.

Top 10 Recommendation

Results

All GCP solutions relate to Drawdown and or CFCH in some way, whether it is clearly stated or not. For the most part the GCP recommendations take the ideas of Drawdown or CFCH and expand them into a more specific example to better fit the greater Cincinnati Area. After reviewing the recommendations, the majority of the most cost effective solutions are within that of the Transportation and Food areas.

- 1) Car Share (Trans. #4) - \$0.00 with 1850 mtCO2e reduced
- 2) Promotion of Dietary Choices (Food #6) - 2.38
- 3) Corporate Sponsorship of Transit Passes (Trans. #7) - 6.38
- 4) Food Recycling (Food #5) - 25.36
- 5) Special Event Recycling (Waste #2a) - 26.15
- 6) Waste Audits (Waste #5) - 26.94
- 7) City-University-Corporate Partnership (Education #2) - 41.67
- 8) Increase Franchise Fee for Waste Collection (Waste #4) - 48.25
- 9) Enhance Public Transit (Trans. #5) - 122.97
- 10) Increase Land for Local Food Production (Food #3) - 125

Conclusion:

In conclusion, the City of Cincinnati can utilize outside resources such as Drawdown, The Carbon Free City Handbook, and the cost benefit research from Xavier University to prioritization recommendations set forth in the Green Cincinnati Plan. The GCP contains many of the same recommendations as the Carbon Free City Handbook and Project Drawdown, both of which are designed to promote the most effective sustainable solutions.