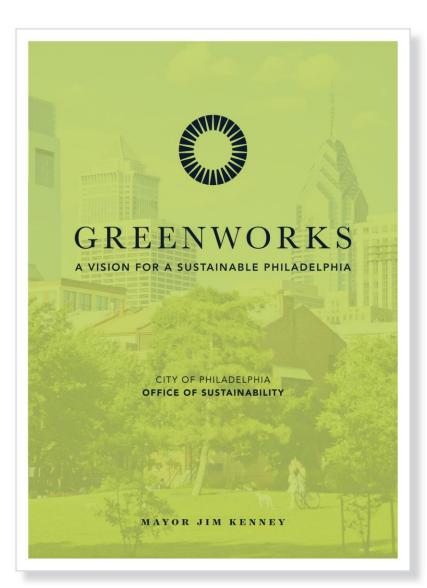
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GREENWORKS a vision for a sustainable philadelphia

Powering Our Future Briefing for Sierra Club Southern PA Group

January 16, 2018









City of Philadelphia Climate Commitments

- Meet requirements of Paris Climate Agreement (reduce carbon emissions 26-28% by 2025)
- Meet global standard for long-term carbon reductions (reduce carbon emissions 80% by 2050)
- Meet pledge of Mayors for Clean Energy (transition Philadelphia to 100% clean energy)

WE ARE STILL IN













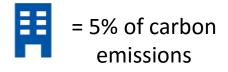
Philadelphia's Carbon Footprint

Buildings and Industry: 79% of carbon emissions



Transportation: 17% of carbon emissions

Waste: 3% of carbon emissions



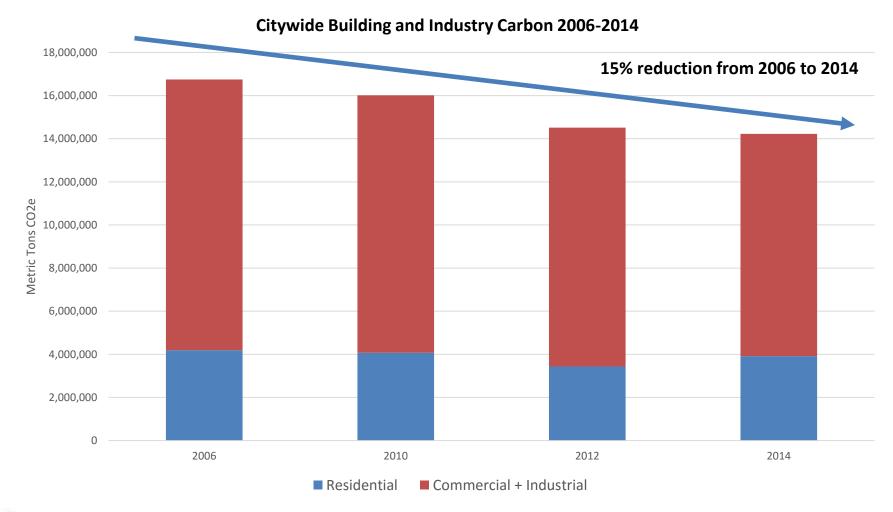






CLEAN AND EFFICIENT ENERGY







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Philadelphia Energy and Carbon Modeling

Citywide Summary (KT CO2e)		5/3/2017		Chart Selection CTY_BLDG_STR							
	All Emissions Sources	Buildings and Streets	16.00	n							
2050 BAU Emissions	499	186	10,00						Grid M	ix Reductions	s
2006 Emissions	558	219	14,00	0							
Target	112	44	(e)						CTY St	trategy Redu	ctions
Reductions Needed below 2050 BAU	387	143	00 12,00	0 +					MUNIC	trategy Redu	
2010 Reduction goal - 2010 (% below 2006 BAU)	7%		보 10,00	D +					MUN 5	trategy Redu	uctions
2010 Reduction goal - 2010 (% below 2006 BAG)	11%							i			
2012 Reduction goal - 2012 (% below 2006) 2014 Reduction goal - 2014 (% below 2006)	15%		5 8,00	0 +				·			
2016 Reduction goal - 2016 (% below 2006)	18%		is coo								
2018 Reduction goal - 2018 (% below 2006)	22%		sin 8,00	U T							
2010 Reduction goal - 2010 (% below 2006) 2020 Reduction goal - 2020 (% below 2006)	25%		± 4.00	n 🗆							ns after Strateg
2030 Reduction goal - 2030 (% below 2006)	44%		9 4,00 동 4,00						Reduct		
2040 Reduction goal - 2040 (% below 2006)	62%		2.00	0						AU Projectio	ns-Buildings
2050 Reduction goal - 2050 (% below 2006)		Example 80X50 goal		-					and Str	reets Goal Examp	
	2006	2010	2012	GHG Er 2014	nissions (KT (2016	CO2e) 2018	2020	2030	2040	2050	Checks
2017 BAU Projections - Total	20,757	19,921	18,368	17,429	16,942	16,483	16.943	17,502	17,702	17,815	0
2017 BAU Projections - Buildings and Streets	13,712	13,397	11,769	11,723	11,346	10,978	11,437	12,158	12,564	12,899	0 1
2017 DAU Projections - Dundings and Sueets						0.0	0.0	0.0			
Grid Mix Reductions	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	5,034.7	
Grid Mix Reductions CTY Strategy Reductions	0.0	0.0	0.0	0.0	0.0	771.1	2,346.1	5,845.9	0.0 6,379.1	5,034.7 3,932.5	-
Grid Mix Reductions CTY Strategy Reductions MUN Strategy Reductions	0.0	0.0	0.0	0.0	135.6 0.0	771.1 1.2	2,346.1 15.0	5,845.9 28.3	6,379.1 31.6	3,932.5 12.3	0
Grid Mix Reductions CTY Strategy Reductions MUN Strategy Reductions Total Reductions	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	0.0 0.0 0.0	135.6 0.0 135.6	771.1 1.2 772.3	2,346.1 15.0 2,361.1	5,845.9 28.3 5,874.2	6,379.1 31.6 6,410.7	3,932.5 12.3 8,979.5	0
Grid Mix Reductions CTY Strategy Reductions MUN Strategy Reductions Total Reductions Remaining Emissions after Strategy Reductions	0.0 0.0 0.0 13,712	0.0 0.0 0.0 13,397	0.0 0.0 0.0 11,769	0.0 0.0 0.0 11,723	135.6 0.0 135.6 11,210	771.1 1.2 772.3 10,206	2,346.1 15.0 2,361.1 9,076	5,845.9 28.3 5,874.2 6,284	6,379.1 31.6 6,410.7 6,153	3,932.5 12.3 8,979.5 3,920	0
Grid Mix Reductions CTY Strategy Reductions MUN Strategy Reductions Total Reductions Remaining Emissions after Strategy Reductions Projected Reductions below 2006 levels (%)	0.0 0.0 0.0 13,712 0.0%	0.0 0.0 13,397 2.3%	0.0 0.0 0.0 11,769 14.2%	0.0 0.0 0.0 11,723 14.5%	135.6 0.0 135.6 11,210 18.2%	771.1 1.2 772.3 10,206 25.6%	2,346.1 15.0 2,361.1 9,076 33.8%	5,845.9 28.3 5,874.2 6,284 54.2%	6,379.1 31.6 6,410.7 6,153 55.1%	3,932.5 12.3 8,979.5 3,920 71.4%	0
Grid Mix Reductions CTY Strategy Reductions MUN Strategy Reductions Total Reductions Remaining Emissions after Strategy Reductions Projected Reductions below 2006 levels (%) Projected Reductions below 2017 BAU Projections (%)	0.0 0.0 13,712 0.0% 0.0%	0.0 0.0 13,397 2.3% 0.0%	0.0 0.0 11,769 14.2% 0.0%	0.0 0.0 11,723 14.5% 0.0%	135.6 0.0 135.6 11,210 18.2% 1.2%	771.1 1.2 772.3 10,206 25.6% 7.0%	2,346.1 15.0 2,361.1 9,076 33.8% 20.6%	5,845.9 28.3 5,874.2 6,284 54.2% 48.3%	6,379.1 31.6 6,410.7 6,153 55.1% 51.0%	3,932.5 12.3 8,979.5 3,920 71.4% 69.6%	0
Grid Mix Reductions CTY Strategy Reductions MUN Strategy Reductions Total Reductions Remaining Emissions after Strategy Reductions Projected Reductions below 2006 levels (%) Projected Reductions below 2017 BAU Projections (%) 80X50 Goal Example	0.0 0.0 13,712 0.0% 0.0% 13,712	0.0 0.0 13,397 2.3% 0.0% 12,715	0.0 0.0 11,769 14.2% 0.0% 12,216	0.0 0.0 11,723 14.5% 0.0% 11,718	135.6 0.0 135.6 11,210 18.2% 1.2% 11,219	771.1 1.2 772.3 10,206 25.6% 7.0% 10,720	2,346.1 15.0 2,361.1 9,076 33.8% 20.6% 10,222	5,845.9 28.3 5,874.2 6,284 54.2% 48.3% 7,729	6,379.1 31.6 6,410.7 6,153 55.1% 51.0% 5,236	3,932.5 12.3 8,979.5 3,920 71.4% 69.6% 2,742	0
Grid Mix Reductions CTY Strategy Reductions MUN Strategy Reductions Total Reductions Remaining Emissions after Strategy Reductions Projected Reductions below 2006 levels (%) Projected Reductions below 2017 BAU Projections (%)	0.0 0.0 13,712 0.0% 0.0%	0.0 0.0 13,397 2.3% 0.0%	0.0 0.0 11,769 14.2% 0.0%	0.0 0.0 11,723 14.5% 0.0%	135.6 0.0 135.6 11,210 18.2% 1.2%	771.1 1.2 772.3 10,206 25.6% 7.0%	2,346.1 15.0 2,361.1 9,076 33.8% 20.6%	5,845.9 28.3 5,874.2 6,284 54.2% 48.3%	6,379.1 31.6 6,410.7 6,153 55.1% 51.0%	3,932.5 12.3 8,979.5 3,920 71.4% 69.6%	0
Grid Mix Reductions CTY Strategy Reductions MUN Strategy Reductions Total Reductions Remaining Emissions after Strategy Reductions Projected Reductions below 2006 levels (%) Projected Reductions below 2017 BAU Projections (%) 80X50 Goal Example Reductions Needed	0.0 0.0 13,712 0.0% 0.0% 13,712 0	0.0 0.0 13,397 2.3% 0.0% 12,715 682	0.0 0.0 11,769 14.2% 0.0% 12,216 0	0.0 0.0 11,723 14.5% 0.0% 11,718 6	135.6 0.0 135.6 11,210 18.2% 1.2% 11,219 0	771.1 1.2 772.3 10,206 25.6% 7.0% 10,720 0	2,346.1 15.0 2,361.1 9,076 33.8% 20.6% 10,222 0	5,845.9 28.3 5,874.2 6,284 54.2% 48.3% 7,729 0	6,379.1 31.6 6,410.7 6,153 55.1% 51.0% 5,236 917	3,932.5 12.3 8,979.5 3,920 71.4% 69.6% 2,742 1,177	
Grid Mix Reductions CTY Strategy Reductions MUN Strategy Reductions Total Reductions Remaining Emissions after Strategy Reductions Projected Reductions below 2006 levels (%) Projected Reductions below 2017 BAU Projections (%) 80X50 Goal Example	0.0 0.0 13,712 0.0% 0.0% 13,712 0 13,712	0.0 0.0 13,397 2.3% 0.0% 12,715 682 13,397	0.0 0.0 11,769 14.2% 0.0% 12,216 0 11,769	0.0 0.0 11,723 14,5% 0.0% 11,718 6 11,723	135.6 0.0 135.6 11,210 18.2% 1.2% 11,219 0 11,346	771.1 1.2 772.3 10,206 25.6% 7.0% 10,720 0 10,978	2,346.1 15.0 2,361.1 9,076 33.8% 20.6% 10,222 0 11,437	5,845.9 28.3 5,874.2 6,284 54.2% 48.3% 7,729 0	6,379.1 31.6 6,410.7 6,153 55.1% 5,236 917 12,564	3,932.5 12.3 8,979.5 3,920 71.4% 69.6% 2,742 1,177 12,899	0
Grid Mix Reductions CTY Strategy Reductions MUN Strategy Reductions Total Reductions Remaining Emissions after Strategy Reductions Projected Reductions below 2006 levels (%) Projected Reductions below 2017 BAU Projections (%) 80X50 Goal Example Reductions Needed	0.0 0.0 13,712 0.0% 0.0% 13,712 0	0.0 0.0 13,397 2.3% 0.0% 12,715 682	0.0 0.0 11,769 14.2% 0.0% 12,216 0	0.0 0.0 11,723 14.5% 0.0% 11,718 6	135.6 0.0 135.6 11,210 18.2% 1.2% 11,219 0	771.1 1.2 772.3 10,206 25.6% 7.0% 10,720 0	2,346.1 15.0 2,361.1 9,076 33.8% 20.6% 10,222 0	5,845.9 28.3 5,874.2 6,284 54.2% 48.3% 7,729 0	6,379.1 31.6 6,410.7 6,153 55.1% 51.0% 5,236 917	3,932.5 12.3 8,979.5 3,920 71.4% 69.6% 2,742 1,177	0
Grid Mix Reductions CTY Strategy Reductions MUN Strategy Reductions Total Reductions Remaining Emissions after Strategy Reductions Projected Reductions below 2006 levels (%) Projected Reductions below 2017 BAU Projections (%) 80X50 Goal Example Reductions Needed	0.0 0.0 13,712 0.0% 0.0% 13,712 0 13,712	0.0 0.0 13,397 2.3% 0.0% 12,715 682 13,397	0.0 0.0 11,769 14.2% 0.0% 12,216 0 11,769	0.0 0.0 11,723 14,5% 0.0% 11,718 6 11,723	135.6 0.0 135.6 11,210 18.2% 1.2% 11,219 0 11,346	771.1 1.2 772.3 10,206 25.6% 7.0% 10,720 0 10,978	2,346.1 15.0 2,361.1 9,076 33.8% 20.6% 10,222 0 11,437	5,845.9 28.3 5,874.2 6,284 54.2% 48.3% 7,729 0	6,379.1 31.6 6,410.7 6,153 55.1% 5,236 917 12,564	3,932.5 12.3 8,979.5 3,920 71.4% 69.6% 2,742 1,177 12,899	0



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Recurring Themes from Public Engagement

- **Engagement Process**
 - How to bring more residents into conversation
- **Industrial Emissions**
 - Role of refinery and other large emitters
- **Co-Benefits**
 - Importance of health, air quality, jobs, and education

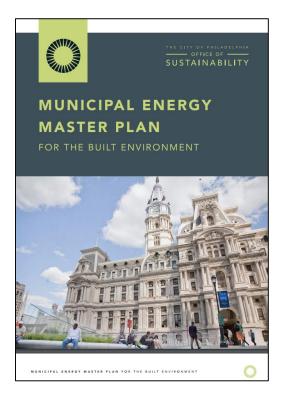








Philadelphia Energy Planning



Released September 2017



Public Comment Period November 2017 – January 2018

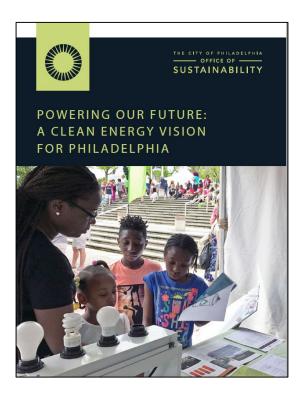


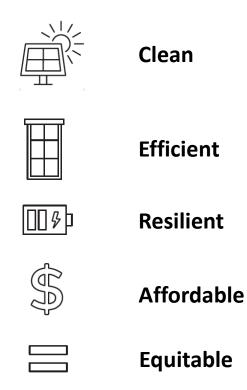
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Powering Our Future: Core Values





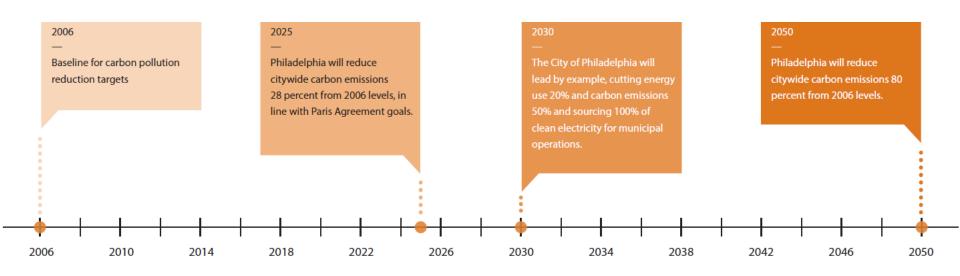








Philadelphia Carbon Pollution Reduction Goals





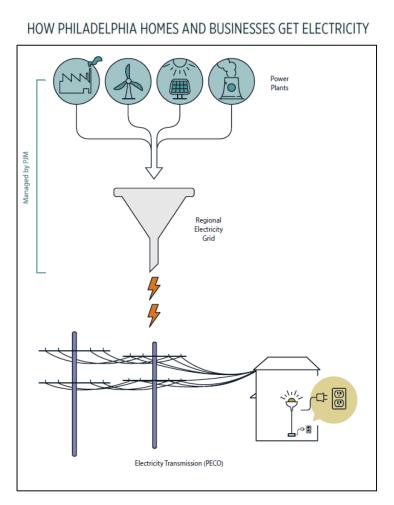




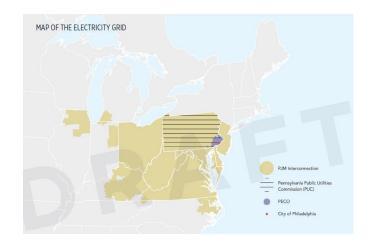
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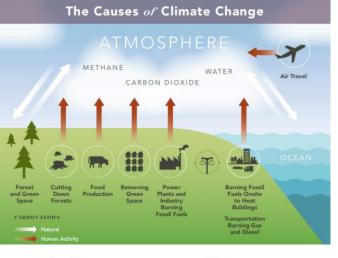


Educating Philadelphians about Our Energy System







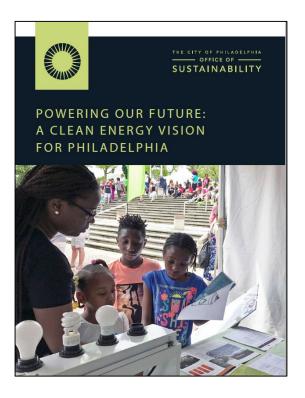








Powering Our Future: How We'll Get There



Clean Electricity Supply

Citywide Solar

Energy-Efficient Homes and Businesses

Low-Carbon Thermal Energy

Low-Carbon Economy

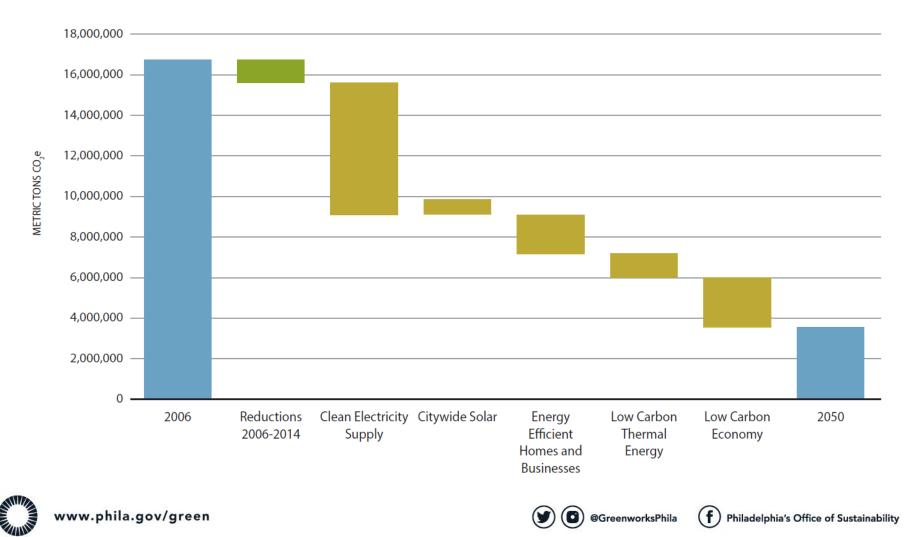








Potential to Reduce Carbon Pollution in Philadelphia's Built Environment





Powering Our Future Playbook

1) Clean Electricity Supply

2) Citywide Solar

3) Energy-Efficient Homes and Businesses

4) Low-Carbon Thermal Energy

5) Low-Carbon Economy



Example Playbook Actions

<u>City</u>: Lead effort for largescale municipal and institutional renewable investment

Residents and Businesses: Choose local renewable energy through PAPowerSwitch.com

State and Federal: Protect and strengthen Clean Power Plan from proposed rollback





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Powering Our Future: Next Steps

- **Public Comment Period**
 - Open through January 31st, 2018
- **City Government Leading by Example**
 - Art Museum and Renewable Energy PPA
- **Further Engagement to Identify Next Steps**
 - Collaborate with communities, institutions, and issue experts







THE CITY OF PHILADELPHIA — OFFICE OF ——— SUSTAINABILITY

GREENWORKS PHILADELPHIA

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www.phila.gov/green

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Philadelphia's Office of Sustainability