# A PACE Enabled World

An Innovative Public-Private Partnership That Expands Access to Energy and Resilience Upgrades For Property Owners in the United States and Around the World





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#### Introduction

It is clear that our climate is changing. Increasingly, extreme weather events are having a serious and sometimes devastating impact on homes, businesses, and communities around the world.

Here in the United States, individuals and communities struggle with the increasing frequency and severity of hurricanes, floods, wildfires, and extreme heat and cold. These weather events lead to increased energy and utility costs, higher insurance premiums, and billions of dollars of storm-related repairs, the costs of which are borne by individual property owners and taxpayers.

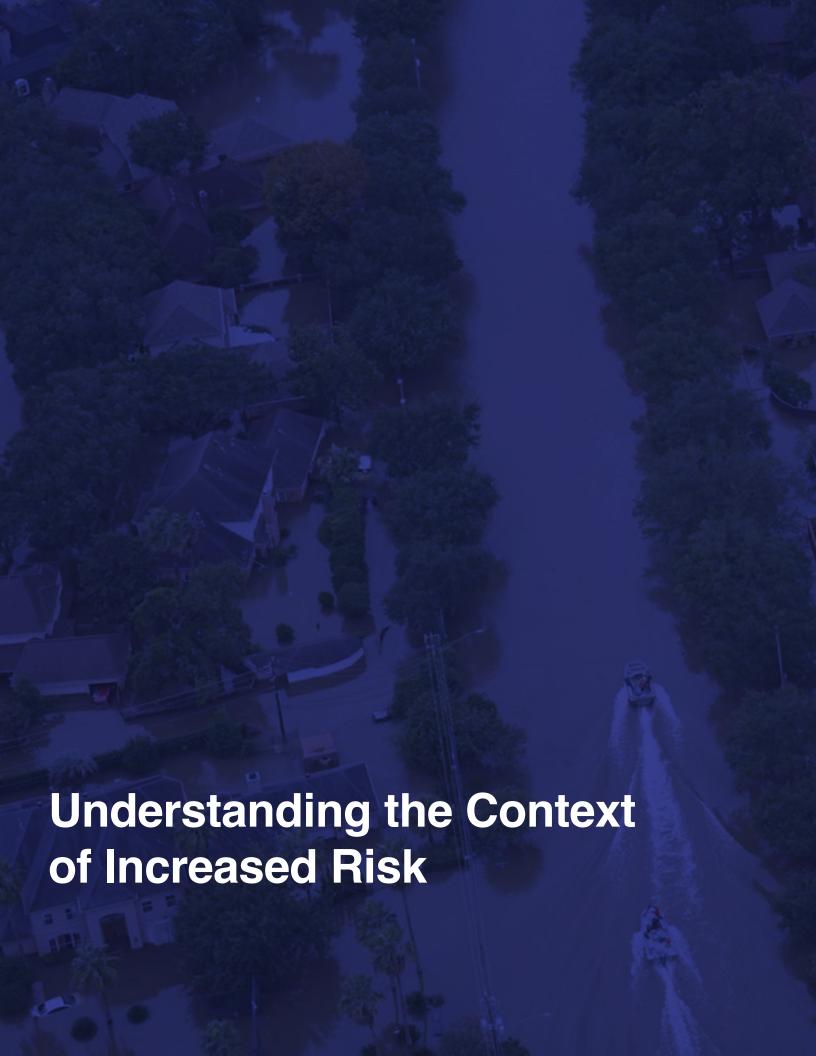
Despite a recent groundswell of political support for environmentally conscious initiatives and investments, affordable financing for energy and resilience upgrades remains unobtainable for many property owners.

Property Assessed Clean Energy (PACE), which leverages a time-tested municipal financing mechanism, is an innovative public-private partnership that expands access to financing for building upgrades related to energy and water efficiency, renewable energy and storage, and natural disaster mitigation.

Established by states via legislation and enabled by local government approval, PACE financing increases access to affordable financing and enables property owners to improve the health and safety of their homes and businesses. PACE fosters sustainability and strengthens communities in ways not possible through traditional financing options.

PACENation is pleased to present this databook as a resource to policymakers interested in fostering resilient and sustainable communities. Policymakers all over the world have identified PACE financing as a critical tool in the global effort to address the impacts of climate change by making the buildings where we live and work healthier, safer and more energy efficient.







### The Price of a Changing Climate

Every year an increasing number of extreme weather events wreak havoc across the country and result in billions of dollars of property destruction, loss, and repairs.

The total cost of extreme weather events is estimated to be over

### **\$4 trillion by 2050**<sup>1</sup>

When property owners are unable to make necessary repairs and upgrades to their homes and businesses, they face long-term deferred maintenance, or, in the worst case scenario, when the property is uninhabitable or unusable, foreclosure and displacement. There is no question that property owners should have the ability to protect themselves and to make necessary improvements to their property—before devastating events occur, and afterwards.

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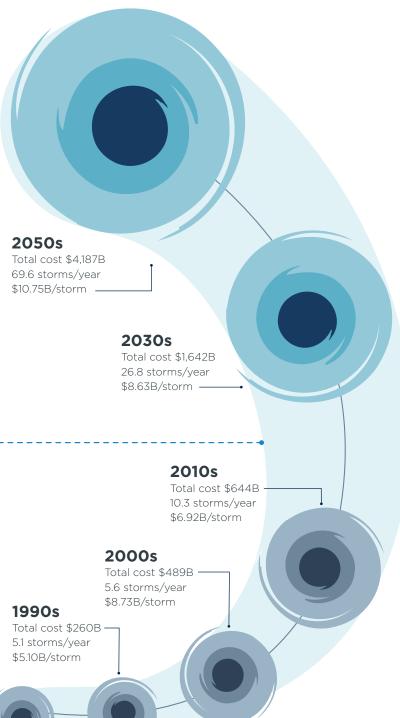
Environmental disasters have cost Americans over

### \$1 trillion since 1980

Since 1980, environmental disasters have cost Americans over \$1 trillion.<sup>2</sup> The total cost of extreme weather events is estimated to reach over \$4 trillion by 2050. This increased risk directly impacts the insurance industry; as a result, the average home insurance rate has risen by 50 percent over the past 10 years alone.<sup>3</sup>

#### 1980s

Total cost \$163B 2.7 storms/year \$6.04B/storm —





Access To Affordable
Financing: An Innovative
Model For Making Critical
Improvements To Homes
And Businesses



### **PACE Financing at a Glance**

PACE financing is an innovative financing solution that makes clean energy and resilience upgrades more affordable and accessible for property owners.

PACE programs are structured to provide property owners with 100% of the upfront cost for an upgrade, meaning no down payment is necessary to secure funding. Instead, the property owner repays the cost of the improvement over time—annually or semi-annually (or as part of their monthly mortgage payments)—through an assessment added to their property tax bills.

And because PACE financing is based partly on the value of the property—not principally on credit history—responsible property owners who have built equity in their homes or buildings and have strong property related repayment histories are able to access funds that would otherwise be more expensive or unavailable through alternative financing options.

## PACE property improvement projects:



Increase energy efficiency and reduce monthly utility bills



Help protect homes and businesses from natural disasters



Create local jobs and drive economic growth in local communities



Contribute to shared environmental, social and governance (ESG) goals that are increasingly important to policymak-





# **Expanding Equitable Access to Clean Energy**

Both internationally and in the United States, efforts are underway to transition the global economy toward clean, renewable energy. These efforts enjoy broad popular support.

According to a national opinion survey by market research firm Maslansky & Partners, 70 percent of Americans agree that "in the near future, we should produce 100 percent of our electricity from renewable energy sources such as solar and wind."

In the residential sector specifically, however, millions of American families have not historically had access to affordable financing for clean energy upgrades. While there are other financing options available in the market-place, very few financial products are a) designed for long-term critical upgrades like solar and b) inclusive—meaning that homeowners across income levels can access them.<sup>4</sup> A peer reviewed study conducted by Lawrence Berkeley National Laboratory found that PACE financing is one of only three policies that increases equitable solar adoption among low- and moderate- income homeowners.<sup>4</sup>

# **Research** Shows

that PACE is one of three policies that increases equitable solar adoption among low- and moderate-income homeowners.



Need For Private Capital: PACE Financing Is Part Of The Solution

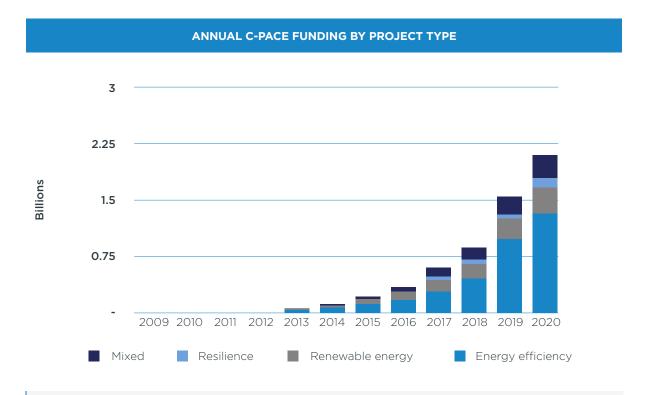


### **PACE for Commercial Buildings**

Commercial PACE (C-PACE) is a key policy to decarbonize the built environment and strengthen commercial and industrial buildings against climate-related disasters.

Commercial and industrial buildings account for approximately 40% of global building sector  $CO_2$  emissions. To fully decarbonize the building sector, the world will need to invest trillions over the coming decades to retrofit existing commercial buildings and ensure that new buildings are built to net zero emission standards.

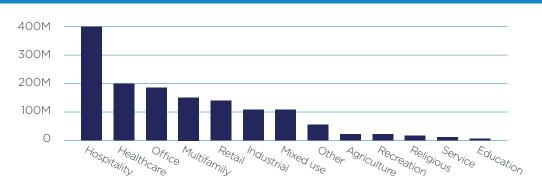
In the United States, C-PACE has proven a successful model for driving large-scale private investments in energy efficiency, renewable energy, and resilience improvements to commercial buildings. Today, there are active C-PACE programs in 26 states and Washington, D.C., and collectively these programs have enabled the investment of \$2.1 billion of private capital for improvements to over 2,000 buildings. Property owners use C-PACE to reduce their energy bills, strengthen their buildings against hurricanes, fires, and floods, and to protect against grid failures and price shocks with local microgrids and energy storage.



As an ESG asset, Commercial PACE has proven to be enormously popular with investors because it delivers significant and quantifiable Environmental, Social and Governance benefits.







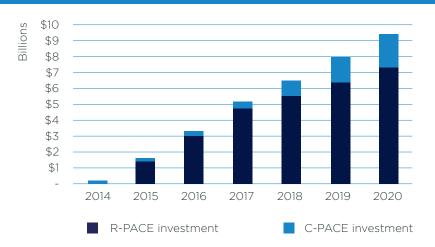
But, even accounting for the investment that has taken place to date, PACE is just scratching the surface of what is possible and what is needed to make the 21st century clean energy economy a reality.

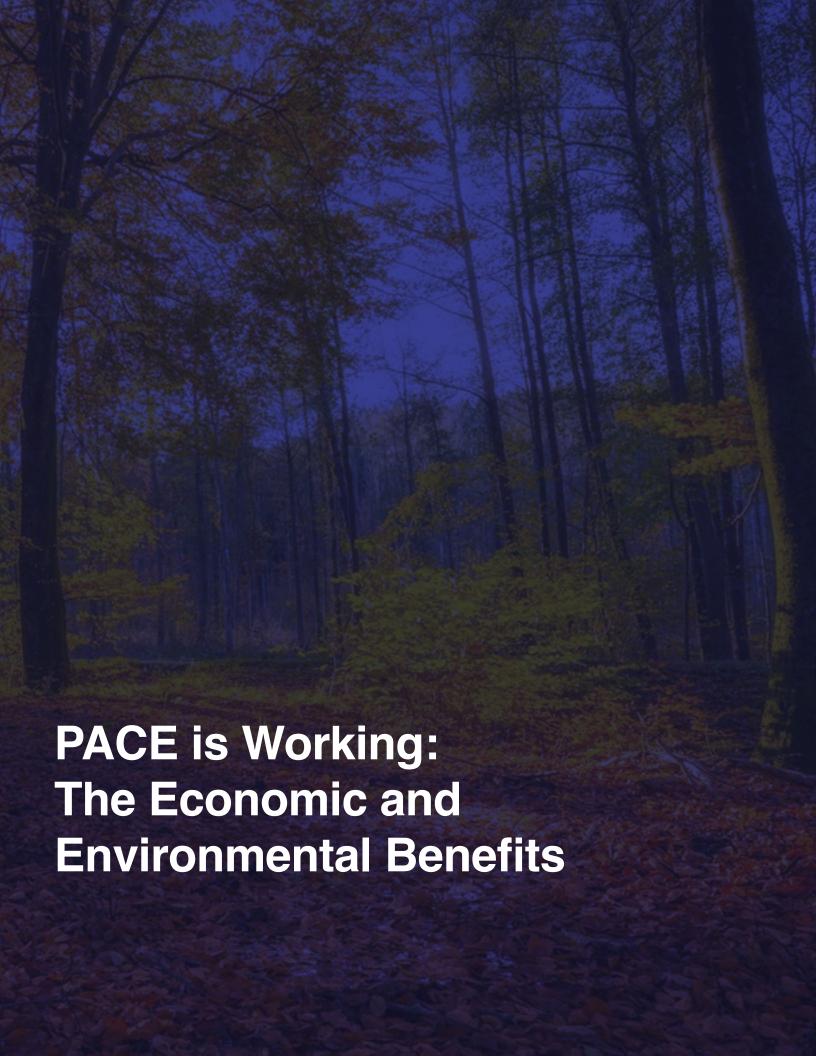
There are over 110 million buildings in the United States. According to the National Association of Home Builders, over half of those buildings were built prior to 1980. The median age of the housing stock in the U.S. is more than 37 years old. And, according to the Environment America Research and Policy Center, between 2007 and 2012 nearly 4 out of 5 Americans lived in a county that was affected by weather related disasters representing approximately 243 million people.

With an aging building stock, the urgent need to electrify and decarbonize our economy, and ever-increasing risks associated with severe weather disasters, investment in the built environment is essential to protect our homes and businesses in the 21st century.

The investment needed to improve those over 110 million buildings will be in the trillions of dollars. Policies like PACE are essential to mobilizing that investment in ways that benefit both the property owners making their homes and businesses safer and the communities where they reside.

#### PACE INVESTMENT TO DATE







# **Understanding the Impacts** of PACE Financing

PACE financing directly benefits working families, businesses, and commercial property owners who make PACE improvements, but the innovative model has significant impacts on the broader economy and environment.

Drawing on recent research out of the University of Southern California's Schwarzenegger Institute and Sol Price School of Public Policy, PACENation estimates that PACE projects completed to date will create more than 150,000 jobs, reduce building sector carbon emissions by 11 million metric tons, and generate over \$19 billion in total economic benefits for local communities.

CURRENT MARKET IMPACTS, CUMULATIVE IN THE UNITED STATES (2009-2020) <sup>5</sup>						
Impact Calculations	Estimated Job Years Added (Thousands)	Estimated Augmented Gross Economic Output (\$ in billions)	Estimated Lifetime Energy Saved (kWh in billions)	Estimated Lifetime Total Carbon Abated (metric tons in millions)		
C-PACE Market Impact	24	3	10	3		
R-PACE Market Impact	128	15	25	7		
Total Market Impact	152	19	36	11		





# Projected Environmental and Economic Impact of PACE Financing Across the U.S.

PACE financing could have a tremendous impact on the environment and the economy if enabled across the United States. This data shows the projected impacts if PACE were utilized in 15% of eligible commercial and residential buildings in each state.

POTENTIAL IMPACTS IF PACE WERE USED IN 15% OF U.S. BUILDINGS <sup>6</sup>						
Impact Calculations	Market size 15% adoption (\$ in billions)	Estimated Job Years Added (Millions)	Estimated Augmented Gross Economic Output (\$ in billions)	Estimated Lifetime Energy Saved (kWh in billions)	Estimated Life- time Total Carbon Abated (metric tons in millions)	
C-PACE Market Potential	298	3	542	1,050	372	
R-PACE Market Potential	367	6	772	1,293	467	
Total Market Potential	666	9	1,315	2,344	840	





		PROJECTED IM	IPACT IF PACE V	VERE UTILIZE	ED IN 15%		
		OF ELIGI	BLE BUILDINGS	IN EACH STA	TE <sup>7</sup>		
State	C-PACE Mar- ket size, 15% adoption (\$ in billions)	R-PACE Market size, 15% adoption (\$ in billions)	Total Market size, 15% adoption (\$ in billions)	Job Years Created (Thousands)	Estimated Eco- nomic Output (\$ in billions)	Carbon Reduced (metric tons in millions)	Energy Saved (kWh in billions)
Alaska	0.9	2	3	50	6	4	11
Alabama	5	6	11	168	22	13	39
Arkansas	4	4	8	119	15	13	28
Arizona	6	8	14	217	28	19	51
California	27	34	62	928	122	41	218
Colorado	4	6	11	172	22	21	39
Connecticut	2	3	6	95	12	4	22
Washington DC	0.9	0.6	1	21	2	1	5
Delaware	0.7	1	2	31	4	2	7
Florida	18	27	45	686	90	60	159
Georgia	7	12	20	312	40	26	72
Hawaii	1	1	2	38	5	5	9
Iowa	4	4	9	137	18	14	33
Idaho	3	2	6	88	12	2	22
Illinois	17	13	31	441	60	36	109
Indiana	6	8	14	214	28	33	50
Kansas	1	4	6	96	12	8	21
Kentucky	4	5	10	158	21	26	37
Louisiana	4	5	9	142	18	11	33
Massachusetts	5	6	11	175	23	12	41
Maryland	3	6	10	165	21	12	37
Maine	4	1	6	81	11	2	22
Michigan	10	14	24	378	49	38	88
Minnesota	5	7	13	194	25	18	45
Missouri	6	8	14	215	28	33	50
Mississippi	2	3	6	100	13	8	23
Montana	1	1	2	39	5	4	9
North Carolina	9	13	23	347	45	26	81
North Dakota	1	0.8	2	31	4	4	8
Nebraska	2	2	4	70	9	9	16
New Hampshire	1	1	3	49	6	1	11
New Jersey	6	9	15	239	31	12	55
New Mexico	1	2	4	69	9	8	16
Nevada	1	3	5	81	10	5	18
New York	16	14	30	438	59	20	107
Ohio	12	14	27	397	53	49	95
Oklahoma	4	5	9	135	17	11	31
Oregon	4	4	9	135	18	4	32
Pennsylvania	14	15	29	43	58	33	105
Rhode Island	1	1	2		4	2	7
South Carolina	5	8	13	200	26	12	46
South Dakota	1	1	2	38	5	2	9
Tennessee	5	8	14	217	28	15	50
Texas	20	23	44	659	87	61	156
Utah	2	3	5	84	11	12	19
Virginia	6	10	16	250	32	17	57
Vermont	0.8	0.8	1	25	3	0.3	6
Washington	4	7	12	186	24	4	43
Wisconsin	6	7	13	202	27	26	48
West Virginia	2	2	5	75	9	13	17
Wyoming	0.8	0.8	1	25	3	4	6



#### **End Notes**

- 1 The total projected impact was derived by taking the decadal data (www.ncdc.noaa.gov/billions/) between 1980-2010 and applying the standard percent increase decade-over-decade of all the storm factors to conclude the total impact of extreme weather events through 2050
- 2 NOAA National Centers for Environmental Information (NCEI), U.S. Billion-Dollar Weather and Climate Disasters (2019). https://www.ncdc.noaa.gov/billions/
- 3 ValuePenguin, Average Cost of Homeowners Insurance (2019). https://www.valuepenguin.com/average-cost-of-homeowners-insurance
- 4 O'Shaughnessy, Eric, et al. "The Impact of Policies and Business Models on Income Equity in Rooftop Solar Adoption." Nature Energy, vol. 6, January 2021, pages 84-91.
- 5 The projections are determined by calculating the individual impacts per project for all industry funded projects based on the University of Southern California Schwarzenegger Institute's study, "Impacts of the Property Assessed Clean Energy (PACE) Program on the Economies of California and Florida," and then applying the individual impact factors to various numbers of hypothetical projects and subsequently scaling the total impacts across those various projections.
- 6 Estimated impact data determined by scaling the impacts of PACE projects based on the University of Southern California Schwarzenegger Institute's study, "Impacts of the Property Assessed Clean Energy (PACE) Program on the Economies of California and Florida" and applying those scaling factors to the total PACE funded volume industrywide.
- 7 Estimated impact projections determined by scaling the impacts of PACE projects based on the University of Southern California Schwarzenegger Institute's study, "Impacts of the Property Assessed Clean Energy (PACE) Program on the Economies of California and Florida" and applying those scaling factors to the total PACE funded volume if PACE were utilized in 15% of buildings in the U.S.



