

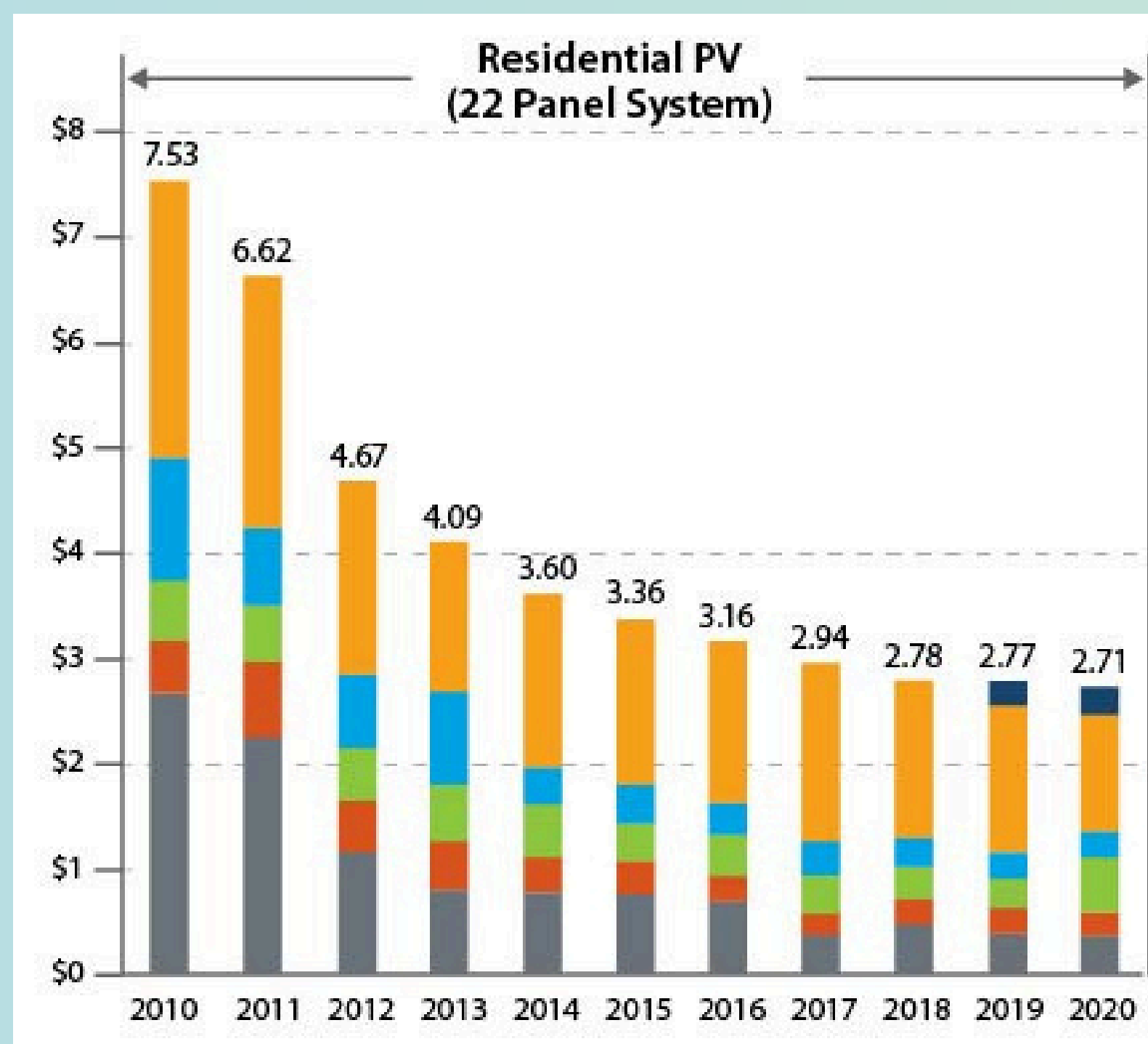
# Rays of Equity: Overcoming Toronto's Solar Barriers

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## Introduction

As the global environmental crisis intensifies, energy-efficient solutions, such as rooftop solar panels, are crucial for achieving net zero. However, low-income households, particularly in Canada, face significant barriers to adopting these technologies despite the availability of subsidies and incentives. This research focuses on understanding the challenges faced by low-income households in Toronto in adopting rooftop solar panels. By comparing Toronto's policies with those of Stuttgart, Germany, and Australia—regions with similar energy challenges and socio-economic factors—the study aims to identify effective strategies for overcoming barriers and promoting equitable access to green energy solutions.

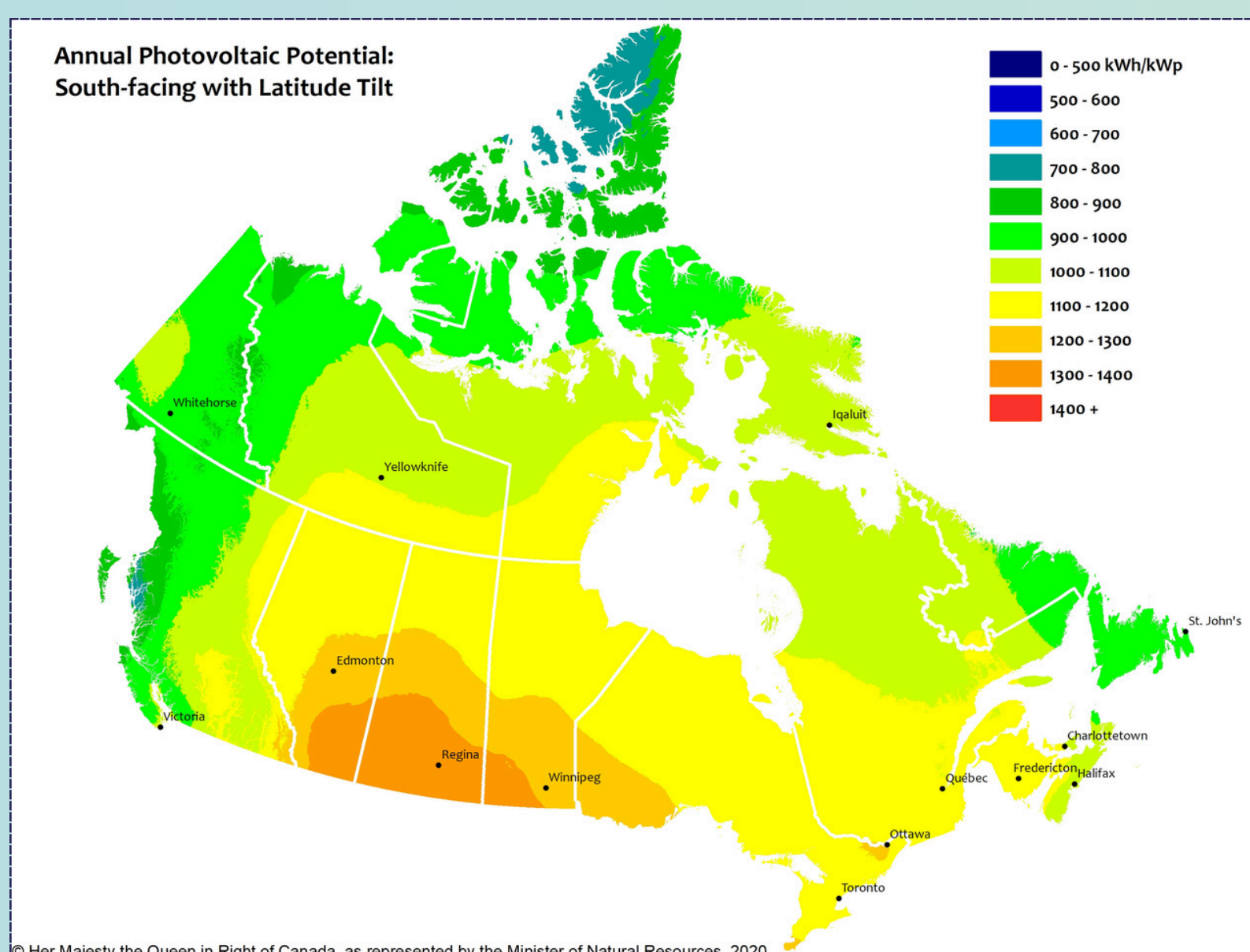


Adapted from: U.S. Solar Photovoltaic System and Energy Storage Cost Benchmark: Q1 2020. <https://www.nrel.gov/docs/fy21osti/78882.pdf>

## Findings

"TransformTO" plan aims for a 65% reduction in emissions by 2030, primarily by decarbonizing the energy sector. Building a local, autonomous and clean energy generation system is a key strategy to reducing reliance on gas-fired plants and addressing energy equity concerns. Toronto has sufficient solar potential to make rooftop solar panels a viable option for households. A 7-kW rooftop system can cover the energy needs of an average household, with costs ranging from \$18,000 to \$21,000. Calculations and research suggest that over time, solar energy generation can be a cost-effective solution in Toronto.

- Low-income households face significant barriers to adopting rooftop solar panels despite existing municipal and provincial programs like HELP, Hi-RIS, and Net Metering.
- HELP and Hi-RIS Programs require homeowners to secure a large portion of the funding upfront, making them inaccessible to many low-income residents, particularly renters and apartment dwellers.
- Net Metering benefits those who already have solar panels, leaving out lower-income households.
- Structural challenges in apartment buildings further limit the feasibility of rooftop solar adoption, exacerbating energy inequality. With 48% of Toronto residents being renters and a significant proportion living in apartment-style dwellings, the lack of accessible programs for these groups perpetuates energy poverty and inequitable access to renewable energy sources

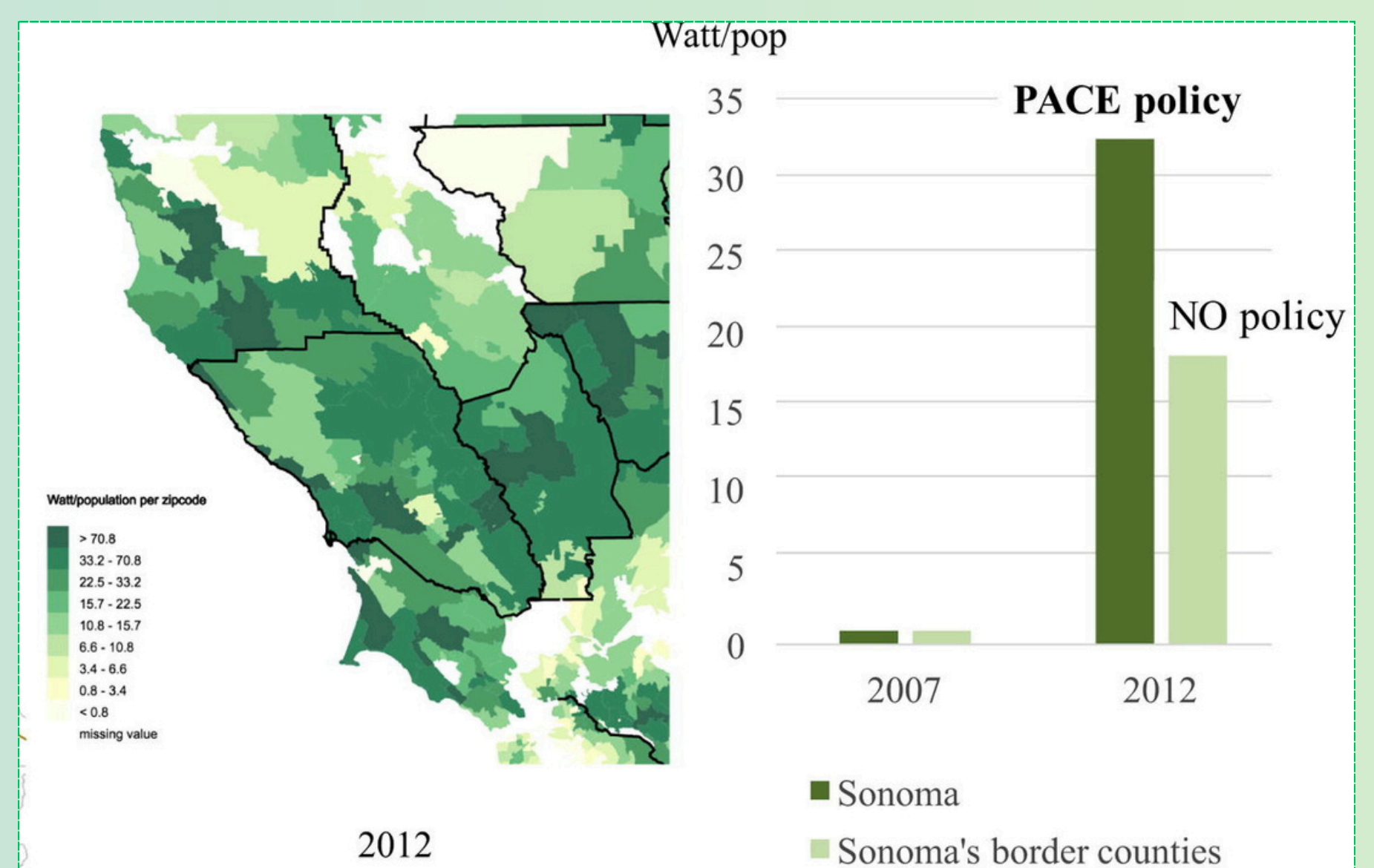


Adapted from: Natural Resources Canada, "Photovoltaic Potential and Solar Resource Maps of Canada," Natural Resources Canada, June 13, 2024.

## Literature Review

Historically, rooftop solar panels were accessible mainly to higher-income households due to high installation costs. Though costs have decreased, policies in the U.S. and Canada still primarily benefit the wealthy, creating inequity in solar adoption. Research highlights that lower-income households, who face the highest energy burden, have the lowest adoption rates despite benefiting most from solar panels.

- Australia's Small-scale Renewable Energy Scheme (SRES) demonstrates that direct subsidies can boost solar uptake, though middle-income households benefit the most
- Financing barriers, such as poor credit scores, further hinder low-income households from adopting solar. Property Assessed Clean Energy (PACE) programs offer a potential solution by providing financing tied to property taxes.
- Homeownership plays a crucial role in solar adoption. Renters, often low-income, are less likely to invest in solar due to the long payoff period and lack of ownership incentives. Shared ownership models for apartment buildings, such as those in Australia, offer potential to address this.



Adapted from: Nadia Ameli, Mauro Pisu, and Daniel M. Kammen, "Can the US Keep the Pace? A Natural Experiment in Accelerating the Growth of Solar Electricity," *Applied Energy* 191 (April 2017): 163–69, <https://doi.org/10.1016/j.apenergy.2017.01.037>.

## Recommendation

Toronto should implement direct financial incentives to lower upfront costs for solar panel purchases. Successful examples from countries like Australia and the U.S. show that subsidies can significantly boost solar adoption among low-income households. Programs similar to Stuttgart's Solar Offensive, which fund installation costs, could also be effective.

Toronto's PACE programs, such as HELP and Hi-RIS, could benefit from private sector involvement to scale up solar adoption. Ontario should establish a regulatory framework with consumer protections to ensure expansion of fair financing options, drawing from successful models in places like New York.

To extend benefits of net-metering and feed-in tariffs to lower-income households, they need to have a higher solar uptake rate. Recent inclusion of third-party solar operators is a positive step to increase viability of PACE financing options.

Given that many low-income households are renters, raising energy efficiency standards for landlords could incentivize solar installations. Updating building codes to require new constructions to be solar-ready would also reduce future retrofit costs.

## Acknowledgement

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