

ENERGY, EQUITY & EMPOWERMENT

Residential Photovoltaics in Portland, Oregon

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Thesis

BACKGROUND

- The cost of electricity has nearly doubled in OR over the past 12 years (OR Public Energy Commission).
- Prices will continue to rise and issues of scarcity and inequality will grow (Bradford).
- Vulnerable populations have a greater risk for energy poverty, and less power over energy decisions (Sobel, Bird & Hernandez, Walker).
- Vulnerable populations risk displacement when sustainable development favors the upper & middle class (Checker).
- 70% of low-income households allocate over half of their income towards rent alone (Center on Budget and Policy Priorities, 2016).
- In Portland an additional 22% on average is allocated towards energy costs, estimated annually at \$1543.88 (Wirfs-Brock, 2016).
- Solar energy can satisfy all our energy needs without relying on accumulated geologic capital (Burkett & Foster).
- Solar technology is efficient enough to support a transition from fossil fuels (Kleidon et al.).
- PV systems can allow for empowerment and resiliency for vulnerable populations (Bird & Hernandez).
- Solar is unevenly distributed (Borenstein).

QUESTIONS

Framing: Are the benefits of residential PV evenly distributed in Portland, Oregon?
Focus: Why are there inequalities in PV access, and what actors, policies, and incentives are involved in this decision making process? How can we look at urban RE policies and incentives critically?

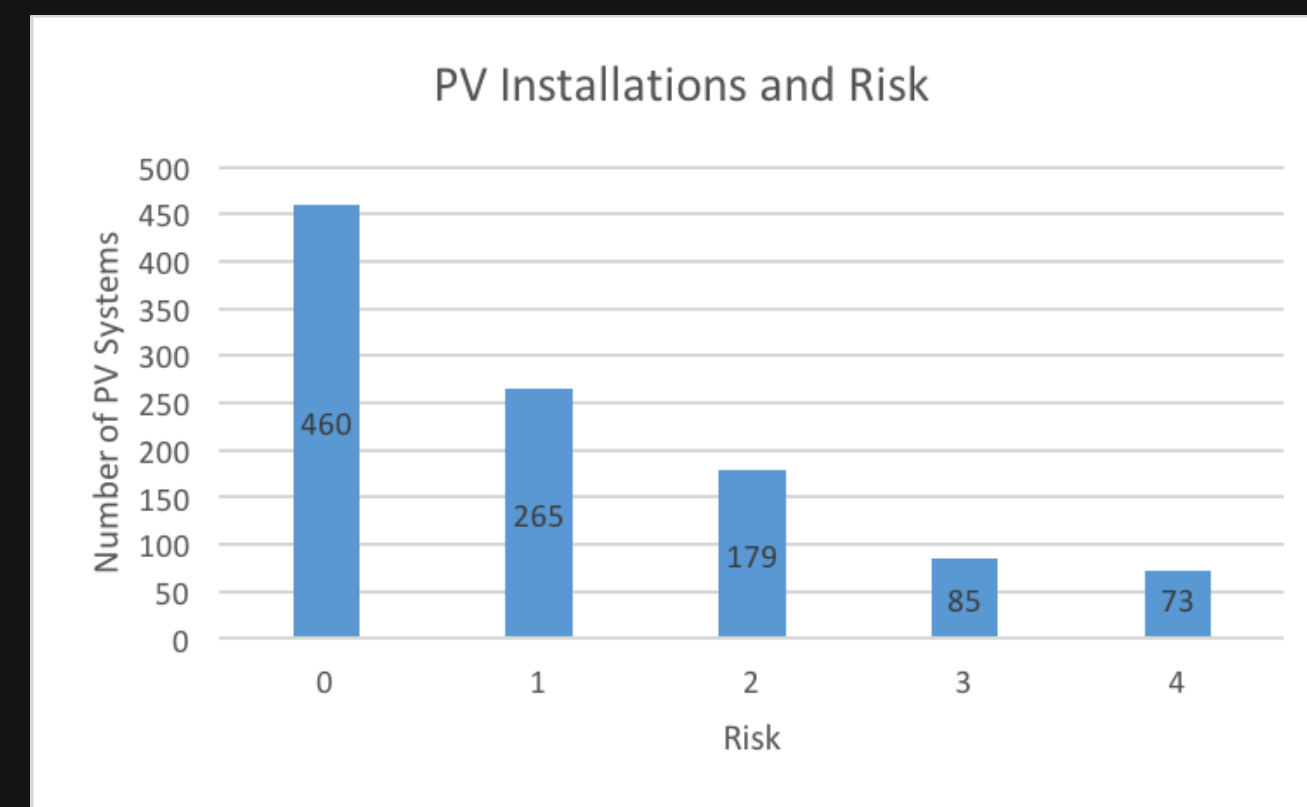
| Risk Factor | Evaluation Criteria | Vulnerability Score | |
|--|--|---------------------|---------------|
| | | Yes (1) | No (0) |
| % Renters | % proportion of renters in the census tract greater than 45.6%? | 1 | 0 |
| % Communities of Color (CoC) | % proportion of CoC in the census tract greater than 27.4%? | 1 | 0 |
| % Population age 25+ without bachelor's degree | % proportion of population 25+ without bachelor's degree in the census tract greater than 56.3%? | 1 | 0 |
| % Households with income at or below 80% MFI | % proportion of households with income at or below 80% MFI in the census tract greater than 43.7%? | 1 | 0 |
| Vulnerability Score | | Max: 4 | Min: 0 |

Every census tract gets evaluated based on the above listed criteria and the total scores on the four risk factors are added to get the overall "vulnerability score". Census tracts that score at least 3 out of maximum 4 are defined as "vulnerable census tracts".

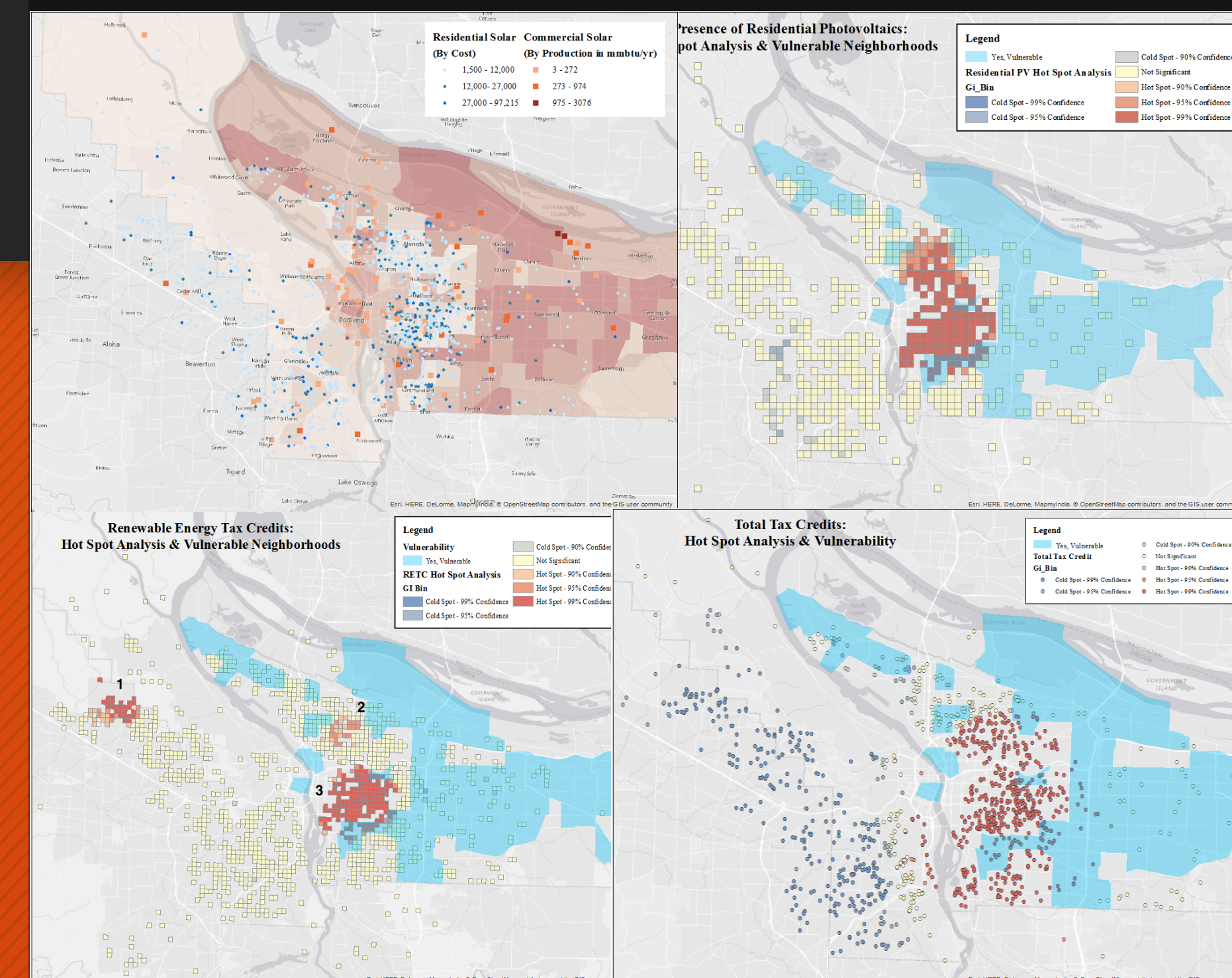
“Social justice is supposed to be an explicit part of any definition of sustainability [and] the surge in environmental awareness in cities has not been matched with concern for social equity”. (Curran and Hamilton, 2012: 1028)

PART 1: SPATIAL

How are PV installations distributed in Portland? Why is spatial inequality important socially?



There are more PV installations in non-vulnerable areas of Portland.



- The spatial characteristics of PV installations and tax credits show that you do not have the presence of one without the other.
- Further analysis of risks specific to %renters and MFI show similar results of distribution, with exception of renters who are not vulnerable.

PART 2: POLICY

Why is solar in some places and not others? Who is left out of PV policies and incentives?

“a call or demand for more democracy, openness and inclusion in processes of decision-making is about enabling access to spaces, and flows between spaces, that have previously been restricted” (Walker, 37).

| US Tax Credit | OR Tax Credit | Energy Trust of OR |
|---|---|--|
| 30% credit. Owner must have; positive tax liability and own/use residence of PV installation (no rentals). Can cover housing coops and condos. Are not equally distributed (Borenstein & Lucas). | \$1.3/WDC, from systems up to 10kWh. \$6k maximum credit, or 50% over 4 years. Most profitable system size with a \$1.3/WDC incentive is 4.68kWh. Owner must have + tax liability. | \$0.45-0.55/WDC depending on efficiency. Maximum \$3600-4600 depending on PGE v. Pacific. For systems 75% TSRF +, 15 year agreement with Energy Trust via. Net metering. Owners must have: good credit, no bankruptcies, no student loan delinquencies, + tax liability, and own/use the property. |

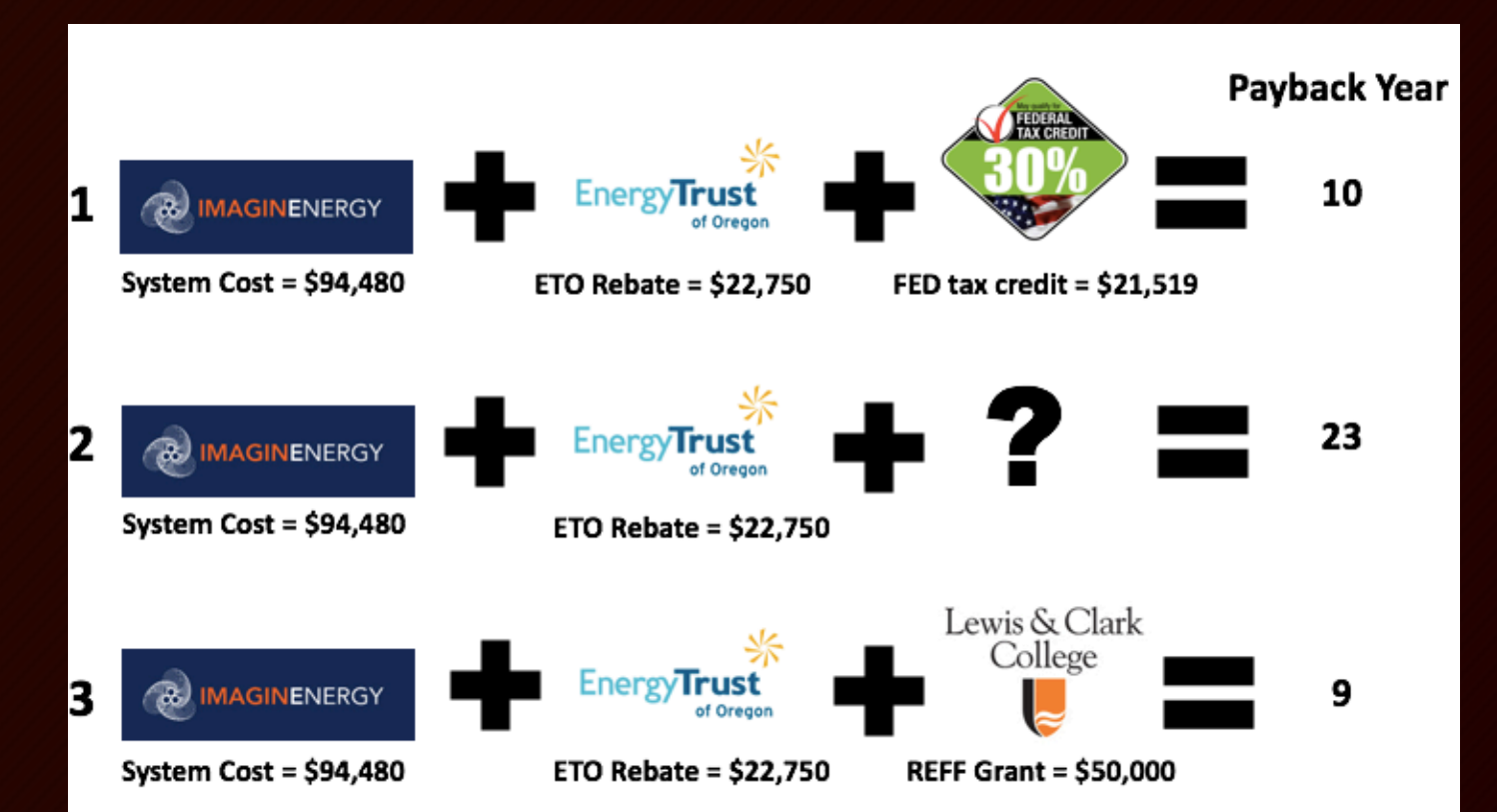
PART 3: CASE STUDY

How can third parties act on behalf of vulnerable populations?

Central City Concern's: Sally McCracken Building



- Energy Trust's incentive for non-profits is \$0.9/WDC with a maximum credit of \$135k.
- Sally McCracken faced utility cost increases of 3.3% per year.
- Decided to install PV with scheduled roof repair, TSRF = 85%.
- 22.75kWh system for \$94,480.
- With a 50k grant from LC, the payback period was shortened to 9 years helping abate future budget disaster.



CONCLUSION

- PV installations are unevenly distributed among Portland's vulnerable populations, high % renting populations, & low MFI populations.
- The federal, & state tax-credit incentives are not accessible to vulnerable demographics, outlined in the language & parameters of policy.
- The Energy Trust of OR incentive restrict benefits to similar demographics, but coerce homeowners into long contracts with utility companies.
- Third party action is the best way to create access for vulnerable populations, but these parties are also vulnerable to funding & incentives.

References: Bird, Stephen, and Hernández, Diana. 2012. "Policy Options for the Split Incentive: Increasing Energy Efficiency for Low-Income Renters." *Energy Policy* 48 (September): 506-14. doi:10.1016/j.enpol.2012.05.053. Borenstein & Lucas. 2012. "The Distributional Effects of U.S. Clean Energy Tax Credits." "Identification and Deployment Study | The City of Portland, Oregon." 2017. Accessed March 16, Gordon Walker. 2012. "Beyond Distribution and Proximity: Exploring the Multiple Spatialities of Environmental Justice." Hernández, Aratani, and Jiang. 2014. "Energy Insecurity among Families with Children." Hernández, Diana, and Stephen Bird. 2010. "Energy Burden and the Need for Integrated Low-Income Housing and Energy Policy." *Poverty & Public Policy* 2 (4): 5-25. doi:10.2202/1944-2858.1098. Mullendore et al. 2015. "Resilience for free: How Solar and storage Could Protect Multifamily Affordable Housing from Power Outages at Little or No Net Cost." Sabol, Patrick. "From Power to Empowerment: Plugging Low Income Communities Into The Clean Energy Economy."