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Utility Redlining: Inequitable Electric Distribution in the DTE Service Area

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WE THE PEOPLE MICHIGAN with Soulardarity & MEJC

POLICY & RESEARCH BRIEF

August // 2022

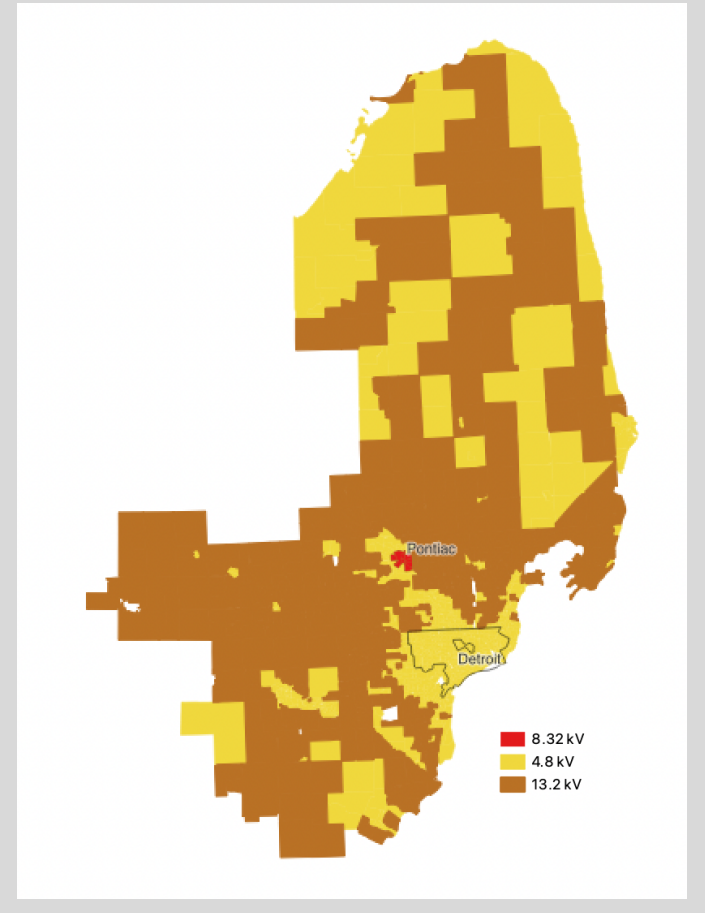
INTRODUCTION

The U.S. has a long history of discrimination when it comes to housing. The practice of denying a home loan based on the race of the neighborhood, or redlining, is the best known example. However, racist practices in housing have led to similar racial disparities in future home mortgages, broadband internet, and retail amenities.¹ Utilities are no different when it comes to employing racial discrimination in the supply and distribution of energy.

BACKGROUND

The Sierra Club found that redlining and systemic racism have significant effects on climate impacts among minority communities.² A study of 108 urban areas in the U.S. found 94% of formerly redlined areas were 7 degrees warmer than non-redlined areas.³ Extreme heat and energy burdens impact minority communities the most with rates of death from extreme heat highest among Black and elderly individuals.⁴ Energy infrastructure and electric

FIGURE 1: DTE Electric Distribution by Census Tract



distribution are critical elements of providing adequate service to vulnerable populations.

KEY POINTS:

1. Key DTEE infrastructure is a decade or more past expected use in 4.8 kV areas
2. In Detroit, with double the vulnerability level as the region, most residents only have outdated electric infrastructure
3. Modernization efforts in Detroit favor industrial and municipal customers over residents

¹Alex B. Hill, "Before Redlining and Beyond. How Data-Driven Neighborhood Classification Masks Spatial Racism", *Metropolitix*, 2 November 2021. URL: <https://metropolitix.org/Before-Redlining-and-Beyond.html>

²Sharonda Williams-Tack, "From Redlining to Restorative Justice: Anti-Black racism and energy insecurity go hand in hand in America", Sierra Club, 21 February 2021. URL: <https://www.sierraclub.org/sierra/redlining-restorative-justice>

³Hoffman, Jeremy S., Vivek Shandas, and Nicholas Pendleton. 2020. "The Effects of Historical Housing Policies on Resident Exposure to Intra-Urban Heat: A Study of 108 US Urban Areas" *Climate* 8, no. 1: 12. <https://doi.org/10.3390/cli8010012>

⁴Khatana, Sameed Ahmed M., Rachel M. Werner, and Peter W. Groeneveld. "Association of Extreme Heat With All-Cause Mortality in the Contiguous US, 2008-2017." *JAMA Network Open* 5, no. 5 (2022): e2212957-e2212957.



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Extreme heat and climate impacts are exacerbated by utility companies' high consumption of fossil fuels as well as their slow adoption of renewable energy. Researchers have found that there has been an inequitable investment in electric distribution systems that support greater adoption of distributed renewable energy, such as local wind and home solar for heating, cooling, or EV charging.⁵

Electrical Distribution

The DTE Electric (DTEE) Southeast Michigan retail service area (Figure 1) is a textbook example of the inequitable electric distribution system.

DTEE predominantly underserves an area that has higher percentages of BIPOC and people experiencing poverty (see Table 1). Social vulnerability, or the potential negative effects on communities, as defined by the CDC is more than double the level where DTEE has left un-upgraded 4.8 kilovolt (kV) electric infrastructure compared to 13.2 kV areas.

TABLE 1: Electric distribution broken down by demographics and Social Vulnerability Index

Indicator	8.32 kV	4.8 kV		13.2 kV
		Detroit	Out Detroit	
Tract Count	10	306	491	642
Percent minority	73.2	89.5	24.0	21.8
Percent poverty	33.8	38.0	14.6	9.5
Percent unemployed	14.3	18.2	6.2	5.3
Social vulnerability index (0-1) ⁶	0.89	0.82	0.43	0.35

TABLE 2: DTEE Average Age of Assets Compared to Industry Life Expectancy⁷

DTEE assets	Industry Life Expectancy	DTEE Avg Age	Avg Age 4.8 kV	Avg Age 13.2 kV
Substations	45	43	53	32
Network banks (transformers)	30	46	40	1
Switchgear	40	37	46	35
Poles and hardware	50	46	49	43
System cable	40	45	64	25

The areas served by 4.8 kV are subject to service inadequacies on numerous fronts identified in the testimony of Soulardarity and We Want Green Too in DTEE's 2022 rate increase case.⁸ Five categories of infrastructure assets are

⁵ Brockway, Anna M., Jennifer Conde, and Duncan Callaway. "Inequitable access to distributed energy resources due to grid infrastructure limits in California." *Nature Energy* 6, no. 9 (2021): 892-903.

⁶ CDC Social Vulnerability Index (SVI), 2018. URL: <https://www.atsdr.cdc.gov/placeandhealth/svi/index.htm>

⁷ *Direct Testimony of Jackson Koeppel on Behalf of Soulardarity and We Want Green, Too, Before the Michigan Public Service Commission, State of Michigan (2022)* (statement of Jackson Koeppel, independent consultant for Soulardarity) <https://mi-psc.force.com/sfc/servlet.shepherd/version/download/0688y000002y4SPAAY>

⁸ *Ibid.*



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substantially older (Table 2), in many cases a decade past their projected life expectancy. This contributes to lower reliability, longer restoration times, and dangerous downed wire conditions.⁹

Hosting Capacity

The 4.8 kV system is archaically behind on safety standards and does not integrate advanced technology like smart grid controls, solar, storage, and EV charging.¹⁰ All of these technologies are advantageous in reducing air pollution, building community wealth, and improving safety and reliability.

The 4.8 kV systems are also ungrounded, leading to death by electrocution, as has been the subject of investigation by the Michigan Public Service Commission (MPSC). The relative ability of 4.8 kV systems to integrate clean and modern technology, and DTEE's failure to plan for near-term upgrades, condemns low-income and BIPOC communities to an expanding gap in technology access and service quality over the coming decades (Table 3).

Infrastructure Hardening: Detroit

The most common rebuttal to service failures is that DTEE is "hardening" its infrastructure, which could mean a wide range of activities from upgrading wires to trimming trees.

TABLE 3: Hosting Capacity of Different kV infrastructure in kilowatts (kW)¹¹

	4.8 kV	13.2 kV
Average Hosting Capacity	138 kW	989 kW
Median Hosting Capacity	150 kW	975 kW

TABLE 4: Demographics of Areas on DTEE Hardening Schedule Compared to Modernization

Indicator	Modern-ization	Hardening		
		2018 - 2019	2020 - 2022	2023 - 2026
Tract Count	62	23	84	132
Percent minority	80.8	94.8	88.7	92.6
Percent poverty	38.2	35.3	13.8	38.1
Percent unemployed	14.5	16.3	17.1	19.6
Social vulnerability index (0-1) ¹²	0.78	0.82	0.87	0.82

⁹ Qualifications and Revised Direct Testimony of Sharon Pfeuffer, Before the Michigan Public Service Commission, State of Michigan (2022) (statement of Sharon Pfeuffer, Vice President of Distribution Operations Engineering and Construction, DTE) <https://mi-psc.force.com/sfc/servlet.shepherd/version/download/0688y000003NfHgAAK>

¹⁰ Qualifications and Revised Direct Testimony of Joy H. Wang, Ph.D., Before the Michigan Public Service Commission, State of Michigan (2022) (statement of Joy H. Wang, public utilities engineer in Electrical Operations Section, MPSC) <https://mi-psc.force.com/sfc/servlet.shepherd/version/download/0688y000002zRNRAA2>

¹¹ Direct Testimony of Jackson Koepfel on Behalf of Soulardarity and We Want Green, Too, Before the Michigan Public Service Commission, State of Michigan (2022) (statement of Jackson Koepfel, independent consultant for Soulardarity) <https://mi-psc.force.com/sfc/servlet.shepherd/version/download/0688y000002y4SPAAY>

¹² CDC Social Vulnerability Index (SVI), 2018. URL: <https://www.atsdr.cdc.gov/placeandhealth/svi/index.htm>



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The DTEE hardening schedule favors wealthier areas of Detroit as opposed to lower income areas. The alternative to hardening is the complete modernization of infrastructure. Yet modernization efforts in Detroit are concentrated in the Greater Downtown area. Hardening efforts initially targeted a much smaller area compared to the areas proposed for hardening after 2023 (23 vs. 132 Census Tracts, **Table 4**). The lowest priority area for hardening in Detroit has the highest poverty rates and the highest level of unemployment.¹³

“ Communities served by **4.8 kV** are plagued by the highest trouble in the DTE Electric system, yet the very system that causes the increased trouble is also the one that limits their ability to seek solutions. ”

- Joy H. Wang, Ph.D., staff at MPSC, Testimony (pp. 86)¹⁴

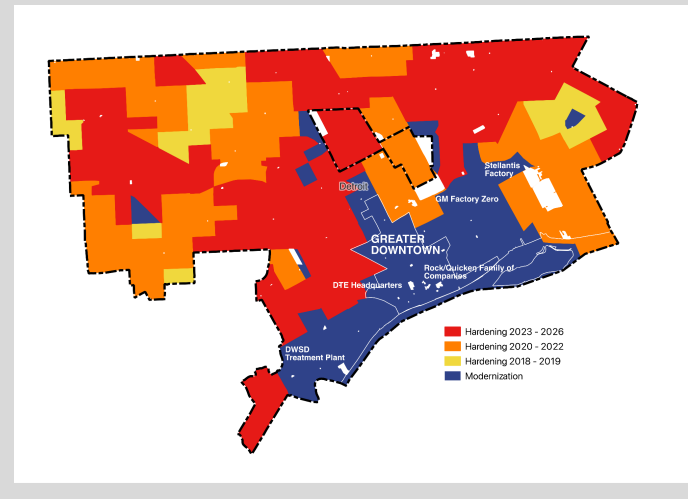
CONCLUSION

The DTEE rate case, asking for a fifth increase in the last 7 years, presents an opportunity for the Michigan Public Service Commission, elected officials, and communities to advocate for equitable modernization of the grid while advancing affordable and clean power.

Detroit, a city with demographic majorities of BIPOC communities, faces some of the starkest disparities related to inadequate electric infrastructure and inequitable investment and prioritization. The issue of utility redlining must be addressed at the root – how infrastructure investments are justified, whether equity analysis is required, and how utilities are held accountable.

—
Alex B. Hill is Research Director at We The People MI; **Jackson Koepfel** is an independent consultant working with Soulardarity

FIGURE 2: Map of DTEE Hardening Areas Compared to Modernization Plans in Detroit (incl. Highland Park & Hamtramck)



Areas for modernization follow broader investment trends that favor Greater Downtown over neighborhoods where more low-income and BIPOC residents live (**Figure 2**). The prioritization on the Lower Eastside aligns with key locations for industrial and municipal customers rather than residential consumers.

¹³ CDC Social Vulnerability Index (SVI), 2018. URL: <https://www.atsdr.cdc.gov/placeandhealth/svi/index.html>

¹⁴ *Qualifications and Revised Direct Testimony of Joy H. Wang, Ph.D., Before the Michigan Public Service Commission, State of Michigan (2022)* (statement of Joy H. Wang, public utilities engineer in Electrical Operations Section, MPSC) <https://mi-psc.force.com/sfc/servlet.shepherd/version/download/0688y000002zRNRAA2>