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Fisher, Sheehan & Colton
Public Finance and General Economics
34 Warwick Road, Belmont, MA 02478
(voice) 617-484-0597 *** (fax) 617-484-0594
(e-mail) roger@fsconline.com

While residential rooftop solar interconnections are critical to a clean energy future, their exclusionary impacts cannot be questioned. Remedies exist.

One concern that has become more prevalent in recent years is not merely the impact of failing to address the need to promote a clean energy future, but also the exclusionary impacts of electric utilities taking aggressive steps to support and promote such a future.

The apparent tension is not irresolvable.

It is not the existence of clean energy programs such as subsidies for residential solar interconnections, unto themselves, that is of concern. Clearly, for example, a move toward solar power is needed in order to move into a clean energy future. The concern is whether, and if so to what extent, there are customers being left behind. Those who will be left behind are those customers who are least able to pay. They are least able to invest in solar generation at their homes.

At the same time, they are least able to pay the increase in fixed system charges that are spread over a smaller and smaller usage base. They are least able to pay the variety of strategies that electric utilities are adopting to stabilize their revenue against their potential decline in revenue (e.g., higher fixed customer charges, revenue decoupling).

The discussion below examines how programs supporting the extension of solar interconnections throughout one utility's service territory in Wisconsin will systematically exclude low-income households unless specific steps are taken to provide solar benefits to low-income households.

Exclusionary Impacts of Solar Programs in Wisconsin

In the 2024 Wisconsin Electric Power Company (WEPCO) electric rate case filed with the Wisconsin Public Service Commission (PSC), the solar interconnection practices of WEPCO were challenged as systematically excluding low-income neighborhoods. This impact is not surprising, given that residential solar panels generally require an investment of tens of thousands of dollars, even assuming that no upgrades need to be made to a home's roof to allow a solar installation.

In the rate case, intervenor Walnut Way Conservation Corporation presented testimony regarding the demographics of the neighborhoods where the majority of interconnections have and have not been made.

The WEPCO Data Considered.

The testimony presented in WEPCO's rate case was able to match, by zip code, the total number of solar interconnections for the years 2022 through 2024 (YTD) to various income indicators for those zip codes. The empirical analysis examined interconnections by Median Household Income (MHI) (i.e., the middle), as well as by the penetration of higher income and lower income households.

The Wisconsin Solar Results.

Zip codes with few, if any, residential solar interconnections in the WEPCO service territory have noticeably lower incomes than those zip codes with substantial interconnections. The 253 zip codes that had no (0) solar interconnections, Walnut Way found, have a Median Household Income (MHI) of $69,394, compared to the two (2) zip codes with between 76 and 80 solar interconnections per zip code (MHI of $117,568). The results of the matching of MHI and solar interconnections are presented in the Table below.

The Table shows the economic disparity between those zip codes with higher MHIs and those with lower MHIs. None of the zip codes with MHIs of more than $90,000 had fewer than 16 solar interconnections. In contrast, the 249 zip codes with zero solar interconnections had an average MHI of less than $70,000. Each of the 12 zip codes with the highest MHIs had no fewer than 40 interconnections each.

Distribution of Solar Interconnections by Median Household Income (MHI) (lowest to highest) (Wisconsin Electric Power Company, WEPCO)			
No. of Solar Inter-connections	Count of Zip Code	Sum of Total Solar: 2022 – 2024	Average of Median household income in the past 12 months (in 2022 inflation-adjusted dollars) -- Total:
<1	249	0	$69,394
56-60	4	229	$73,130
26-30	11	309	$73,145
46-50	6	287	$77,342
31-35	8	268	$79,002
11-15	26	335	$79,854
1-5	59	156	$81,375
21-25	12	276	$82,128
66-70	1	68	$84,409
6-10	34	277	$85,010
16-20	8	144	$92,102
41-45	3	127	$93,123
36-40	7	264	$93,668
76-80	2	154	$117,568
Grand Total	430	2894	$74,923

The Table below shows the same data organized somewhat differently. The Table ranks WEC's zip codes lowest to highest by MHI. The Table shows that the 87 zip codes with an MHI less than $60,000 had 425 solar interconnections, an average of 4.9 interconnections per zip code. In contrast, however, the 84 zip codes with an MHI of $90,000 or more had 1,109 solar interconnections, an average of more than 13 interconnections per zip code, nearly three times more.

The Walnut Way Conservation Corporation concluded that the concerns are reasonable that lower income households, as well as geographic areas with lower income households, will be left behind by Wisconsin's move to a clean energy future. Specific action needs to be taken to ensure this does not occur.

Solar Interconnections by Median Household Income (Wisconsin Electric Power Company)		
Median Household Income[1]	Sum of Total Solar Interconnections: 2022 – 2024	Count of Zip Codes
<$20,000	1	1
$20,000 - $29,999	19	3
$30,000 - $39,999	0	1
$40,000 - $49,999	227	23
$50,000 - $59,999	178	59
$60,000 - $69,999	351	107
$70,000 - $79,999	546	92
$80,000 - $89,999	463	60
$90,000 - $99,999	425	42
$100,000 - $109,999	260	17
$110,000 - $119,999	229	13
$120,000 - $129,999	163	7
$130,000 - $139,999	6	1
$140,000 - $149,999	26	4
Grand Total	2,894	430

[1] Median household income by zip code is obtained from the American Community Survey (5-year data), Table B19013.

The Recommended Response

In July 2022, WEPCO and WPSC filed an application requesting approval to modify and extend two existing solar programs and add one new program.[2] In its Final Decision in July 2023, that application was approved in part and denied in part.[3] As part of that proceeding, the Company proposed what it referenced as the Renewable Pathway Pilot program. This program would allow certain commercial and industrial customers to "subscribe to a portion of a utility-scale, Wisconsin-based renewable energy generating facility."[4] Customers would be given the option to subscribe to either a one-year or five-year subscription period.

The Commission approved the proposed program with modifications not relevant here. The concerns expressed by Chairperson Rebecca Cameron Valcq, however, *are* relevant here. Chairperson Valcq, in dissent, stated that:

> it is concerning that some of the utility-scale projects I previously voted to approve were subsequently identified in this docket as projects to be used for the Renewable Pathway pilot. Carving out a small group of customers to reap the benefits from these projects after-the-fact calls into question the basis upon which a public interest finding was made in the initial construction or acquisition docket.[5]

Based on this prior Commission discussion, Walnut Way recommended that WEPCO incorporate the following two additional components into its Renewable Pathways pilot initiative.

- First, the Company should dedicate five percent (5%) of the total kW capacity to support first-time home buyers assisted through the State Department of Administration, Division of Energy, Housing and Community Resources ("Department").

- Second, the Company should also make that set-aside available to developers of new housing assisted with local, state or federal funds.

There is, Walnut Way observed, precedent in Wisconsin for the Commission to make such a decision. The Commission's December 2023 Final Decision in the Wisconsin Power and Light (WPL) rate proceeding adopted a nearly identical recommendation. In that decision, the Commission stated:

> The Commission agrees that the applicant can do more to make its community solar program more accessible. Therefore, the Commission finds that it is reasonable to direct the applicant to

[2] Joint Application of Wisconsin Electric Power Company and Wisconsin Public Service Corporation for Approval of Modifications to the Solar Now and Dedicated Renewable Energy Resource Pilot Tariffs and Approval of the Renewable Pathway Pilot tariff and Deferral Requests, Docket 5-TE-101, Application (July 19, 2022),

[3] Docket 5-TE-101, Final Decision (July 13, 2023).

[4] Id., at 14.

[5] Id., Valcq Dissent, at 1.

> file a [proposal], by no later than December 31, 2024, to propose modifications to its tariff regarding the expansion of access of low-income customers to its community solar program by dedicating five percent of the total kW capacity to support first-time home buyers assisted through the Division of Energy, Housing and Community Resources, and by carving out a percentage of community solar blocks which is equal to the total percentage of applicant's customers with income at or below 200 percent of the federal poverty line.[6]

Walnut Way observed that there are affordable programs throughout Wisconsin that could benefit from such a program. According to the Wisconsin 2023 Annual Action Plan, to implement the Consolidated Plan filed by the state with the federal Department of Housing and Urban Development (HUD), the objectives of the State from 2020 through 2024 were stated to include (1) to rehabilitate 1,114 household housing units, (2) to rehabilitate 267 rental housing units; (3) to construct 128 rental housing units; and (4) to provide down payment assistance to 342 homebuyers.

Providing, at WEPCO expense, 5% of the Renewable Pathway Pilot to these affordable housing initiatives, Walnut Way said, would be a "small, but significant," step toward promoting the objective to make solar simple and accessible to everyone, including, specifically, to those customers who cannot afford the installation costs.

[6] Application of Wisconsin Power and Light Company for Authority to Adjust Electric and Natural Gas Rates, Docket No. 6680-UR-124, Final Decision, at 80, 93 (December 20, 2023).

Summary and Conclusions

Utility-sponsored clean energy programs supported by ratepayer dollars represent critical steps to be taken toward a clean energy future. Without specific, intentional, attention devoted to the exclusionary impacts which such programs have on low-income neighborhoods, however, low-income utility customers will not only end up paying for the programs while receiving none of the benefits, but will also be subject to the adverse impacts of the corresponding utility responses deemed to be necessary to mitigate ensuing revenue losses.

Remedies do exist, however, if specifically addressed by rate case interventions and proposals advanced for regulatory decision-making.

Persons interested in more information about how to assess the impacts of clean energy programs on low-income neighborhoods, and what remedies might be adopted, can write for more information at:

roger [at] fsconline.com

Fisher, Sheehan and Colton, Public Finance and General Economics (FSC) provides economic, financial and regulatory consulting. The areas in which *FSC* has worked include energy law and economics, fair housing, local planning and zoning, energy efficiency planning, community economic development, poverty, regulatory economics, and public welfare policy.