Addressing Energy Hardship By Putting Communities at the Center - Comparative Approaches in Aotearoa New Zealand, the United States, and Canada

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ABSTRACT

Nearly 200 countries at the 2023 United Nations Climate Change Conference (COP28) recently signed on to "transitioning away from fossil fuels in energy systems, in a just, orderly and equitable manner, [...] so as to achieve net zero by 2050 in keeping with the science." The Hard-to-Reach (HTR) Energy Users Task by the Users Technology Collaboration Programme (Users TCP) by the International Energy Agency (IEA) recently started its second research phase to assess how there can be a "just and equitable" energy transition, especially for those energy users who remain hidden from policy makers and program managers. In this paper, we compare and contrast approaches to the just transition between the United States, Canada, and New Zealand. In all three countries, significant challenges, particularly around structural inequity for minorities, are deeply embedded in both society at large, and the energy system. In 2019, the NZ government undertook an "Electricity Price Review" highlighting issues that impact vulnerable and indigenous communities; from which sprang several government, industry, research, and community initiatives. In the U.S., the "Inflation Reduction Act", "Justice40 Initiative", and "Equity in Energy Initiative" are federal commitments dedicated to supporting underserved communities. In Canada, the "Gender Based Analysis Plus" considers the intersecting impact of identity on the effectiveness of government initiatives. This paper will explore these initiatives and investigate how three countries with different energy systems, but similar goals and challenges, aim to overcome the impact of systemic energy injustice to support a just transition towards a carbon free future.

Introduction

Users TCP by IEA Hard-To-Reach Energy Users Task

The HTR Task Phase I started in early 2019, with three financially participating countries (the U.S., NZ, and Sweden), and several in-kind participants (from the UK, Portugal, the Netherlands, Italy, and Canada). Its initial shared goal was to "*identify, define, and prioritize HTR audiences; and design, measure and share effective strategies to engage those audiences to achieve energy, demand response and climate targets while meeting access, equity, and energy service needs."* We produced several seminal publications which inform this paper, including an in-depth review of 1,000 publications to characterize HTR audiences (Rotmann et al. 2020); case study analyses of 19 HTR programs in 8 countries, two of which we will draw on here (Ashby 2021; Rotmann 2021); a white paper outlining our research methodology, called the "Building Blocks of Behavior Change" (Karlin et al. 2021; Karlin et al. 2022); a Cross-Country Case Study Assessment (Mundaca et al. 2023); field research pilots (Rotmann and Cheetham 2023; Rotmann 2024), and a Final Country Report and Recommendations (Rotmann 2023; Rotmann et al. 2023).

Terminology and Characterizing the HTR

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Our international collaboration also came up with a shared initial definition for HTR energy users that remains purposefully broad in order to include all possible end user segments: *"In this Task, a hard-to-reach energy user is any energy user from the residential and non-residential sectors, who uses any type of energy or fuel, and who is typically either hard-to-reach physically, underserved, or hard to engage or motivate in behaviour change, energy efficiency and demand response interventions that are intended to serve our mutual needs."* Our in-depth review established that the potential size of these HTR audiences exceeded two thirds of global energy users, showing just how extensive the issue was, and how many audience segments remained critically under-researched and underserved (Rotmann et al. 2020).

While terminology and jargon evolve over time, starting with co-developed shared definitions enables a common point of understanding, and ensures stakeholders are on the same page. Our terminology and understanding has already evolved since 2019. We acknowledge that the titular name of the project, "hard-to-reach energy users", can unintentionally and unfairly put the onus of "being reached" on the energy user, rather than the program administrator where it rightfully falls (Rotmann et al. 2020). In New Zealand (NZ), for example, we focused on "energy hardship", including "hidden hardship". In the U.S., Consortium for Energy Efficiency (CEE) members are transitioning towards using the phrase "underserved audiences" or "audiences who are underserved by [X organization]", and CEE has recently switched to using the phrase "priority audiences", something the HTR Task also hopes to embed going forward.

Establishing clearly defined HTR audience subsegments with international subject matter experts can assist policy makers and program administrators to build on established successes. Utility program administrators in the U.S. and Canada often have mandates specific to serving income-eligible (low-income, LI) energy users within their service territories, and the first step to serving those customers is establishing underlying hypotheses believed to be contributing factors. ACEEE's review of low-income energy efficiency (EE) programs in the U.S. show, however, that despite spending almost $1 billion per year, engagement, uptake and benefits arising from these programs are much lower than expected (Morales and Nadel 2022). On the flipside, ACEEE's most recent report showed that electrifying U.S. households, if done equitably, can create $96b in net cost savings by 2050 (Fadali et al. 2024).

Even though HTR energy users have received more focus recently, no country has yet managed to engage the majority of energy users in the energy transition. This is partly because we often conflate LI households as being HTR, and in part because these programs rarely use equity metrics such as "energy burden", nor are they usually co-designed with relevant members of these underserved communities to be tailored specifically to their needs (Mundaca et al 2023). The combined work from Phase I of the HTR Task has clearly shown that low-income is an insufficient and overly simplistic characterization of hard-to-reach customer segments, and that low-income households, with no other compounding or intersecting vulnerabilities, are often not that challenging to reach. As low-income is the main eligibility criterium for many, if not most, residential programs aimed at HTR energy users, we are potentially missing out on a huge section of underserved energy users, who remain "hidden" (Rotmann 2023; Willand, Torabi, and Horne 2023; Rotmann 2024). These hidden energy user segments, and how to include them in a just energy transition, is the focus of Phase II of our research.

Defining Equity and Energy Justice

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An advisory committee composed of CEE member equity experts published an equity definitions framework which emphasized the importance of establishing consensus-developed definitions around energy equity to enable a common point of understanding for future equity work (CEE 2023a). Rather than providing everyone with the same learnings and recommendations and expecting everyone to derive the same benefit (*equality*), *equity* acknowledges that different groups face different issues and as a result may need different support to achieve the same results (Linton 2011). Historically, systemic barriers have prevented equal and representative participation of certain groups and individuals due to the practices and policies ingrained in society. Equity should be understood as promoting equal outcomes for audiences with differing needs by addressing systemic barriers, such as those based on race, gender, sexuality, class, disability status, or geographical location. Energy *justice* highlights the social justice concerns in the energy transition, and it is the method by which equality, fairness and equity are achieved. It includes having equitable access to energy services for all humans (as a universal public good), the fair distribution of costs and benefits, and the right to participate in choosing whether and how energy systems will change (Miller, Iles, and Jones 2013). Our current energy system is anything but just, according to these principles. Transitioning to a truly just and sustainable energy system means incorporating these principles into its design and implementation, as well as acknowledging and addressing systemic and structural injustices.

Achieving A Just Transition in Practice

Equitably serving energy users requires addressing procedural and distributional justice. Procedural equity ensures representative engagement in processes to develop or implement programs and policies. For example, putting processes and protocols in place to ensure those not equitably served are afforded opportunities to provide input into policy and program design and implementation (feedback that is ultimately incorporated), and are duly compensated for their time in doing so. Distributional equity entails programs and policies that result in fair distribution of benefits and burdens across all end user segments. Distributional equity could include efforts to make sure non-energy benefits extend to all energy users (CEE, 2023a).

In practice, distributional equity will (1) achieve measurable progress towards participation parity[1] or energy savings parity[2] across a variety of underserved audiences; (2) ensure non-energy benefits accrue in a comparable way across all segments and audiences; and (3) focus on customers "*burdened with economic challenges, racial inequity, negative environmental impacts, and justice disparities*" (CEE, 2023b). Further, program administrators in the U.S. highlight that both procedural and distributional equity are required for a just energy transition, and that procedural equity can be leveraged and is required to achieve better distributional equity. By contrast, in NZ, despite significant attention in recent years being given to addressing energy hardship (and, to a lesser extent, its underlying inequities), there is no such clear focus yet by either government or industry to embed equity principles in its policies, programs, and processes.

[1] **Participation Parity** is the proportion of program participants in a given segment compared to the proportion of customer base in that segment.

[2] **Energy Savings Parity** is the proportion of program benefit (savings or incentive) going to that segment compared to the proportion of the customer base in that segment.

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To provide one example of how difficult it is to achieve the policy balance of the "energy trilemma" (IEA 2023) of competing goals of politics (security of supply vs energy access), economics (profit vs affordability), and sustainability (decarbonization vs pollution), we will focus on "clean electrification" for a moment. Welton (2017) outlines the difficulty of clean electrification when compared with the challenge of 'simply' electrifying (i.e., providing access to the electric grid, something almost 775 million energy users still lack) as follows: *"Although there are important parallels with electrification, clean electrification is a more contentious and complex program than its historical counterpart. Stripped to its barest aspirations, the clean energy transition is one of switching fuel sources, from those that emit greenhouse gasses to those that don't. Such a switch might alleviate or exacerbate inequality depending on the form it takes. We could all connect to the grid. We cannot all put solar panels on our roofs."*

This quote raises an additional complexity, namely that perhaps we ought not to view the competing policy areas as a trilemma, but rather a "quadrilemma", where social justice and equity considerations are the lens that other competing policy areas should be viewed through (Olabi 2016; López-González, Ferrer-Martí, and Domenech 2019). Thus, to pursue a just energy transition and decarbonize the system to achieve net zero, it is imperative that program administrators consider the impact of electrification on priority audiences, as electricity is often far more expensive than alternative energy sources, many priority audiences may not have the resources required for fuel switching, and many remain unengaged and hidden from business-as-usual approaches to outreach (Rotmann 2023). We provide more detailed examples of federal (U.S. / CAN) and national (NZ) country policies, and community-centered case studies of programs and interventions from three of our participant countries, in the next section.

The Just Energy Transition in the United States and Canada

From the Top Down: Federal and State Policies and Programs

The United States and Canada present distinctive case studies due to the nuances in how energy efficiency programs are implemented and regulated. In Europe, energy programs are mostly government-run. However, in the U.S. and Canada, the entities that regulate EE programs are more often utilities. Energy efficiency programs in the U.S. are partially, though not exclusively funded by customers who pay bills for electricity and natural gas usage (ratepayers; Rotmann and Ashby, 2019). While there may be differences in ownership structure, most customers are served by investor-owned utilities which are commonly regulated by public utility commissions (PUCs) or in a deregulated market, federal oversight (Cleary and Palmer 2022). In Canada (and NZ), EE programs are commonly funded by taxpayer contributions; here, utilities are traditionally considered Crown corporations and owned by the government (Ashby 2021; Rotmann and Ashby 2018). In both cases, the bodies running energy efficiency and conservation programs (typically referred to as program administrators) are often heavily regulated as monopolies and driven by state and local policies that dictate goals of utilities and how programs are run. Furthermore, as a result, many utilities are required to meet specific EE targets, and programs that count towards these targets must meet cost-effectiveness and other evaluation requirements (Ashby 2021). In this context, there is not often a direct connection between the actions of federal and state government bodies, although this can differ between states. However, federal actions to address equity in energy can help set the context and focus of the country's needs, thus indirectly impacting the scope and drive of state policy and regulations.

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The Biden Administration has been aggressive on setting expectations for environmental justice. On his first day in office, President Biden signed the "Executive Order on Advancing Racial Equity and Support for Underserved Communities Through the Federal Government". This mandate recognized the human costs of systemic racism and poverty and called for a whole government approach to equity. It required an annual public equity plan that holds senior leadership in government accountable for progress, and focuses on community engagement, investing in small, disadvantaged businesses, and ensuring equity in automated systems, artificial intelligence, and data (The White House 2023). In February 2023, the White House committed to "Further Advancing Racial Equity" in which all Cabinet-level agencies released Equity Action Plans for 2023 including over 100 community-informed strategies and actions, and highlighted examples of more than 650 actions the agencies took since the call to action in 2022. These executive orders, along with the equity in energy initiatives (outlined below) the U.S. Federal government is taking help to bolster funding for projects, reduce energy costs and increase energy security for underserved communities.

Justice40. In 2021, President Biden signed Executive Order 14008: Tackling the Climate Crisis at Home and Abroad . This commits the United States federal government to ensuring 40 percent of the overall benefits of certain federal investments flow to disadvantaged communities that are marginalized, underserved, and overburdened by pollution. Among the categories of investment are clean energy and energy efficiency, clean transit, training, and workforce development (The White House 2021).

The Inflation Reduction Act (IRA) of 2022 "seeks to improve US economic competitiveness, innovation, and industrial productivity" by providing one of the nation's largest investments in history to support clean energy, reduce healthcare costs, and increase tax revenues (McKinsey 2022). The IRA advances the aims of the Justice40 Initiative and specifically outlines a subset of funding for underserved audiences and mandates recipients of funding to demonstrate equity impacts. For instance, states are required to submit Community Benefits Plans which facilitate community engagement, promote equity goals, and ensure at least 40% of the benefits of the program flow to disadvantaged communities (Bell-Pasht and Ungar 2024). In practice, this funding is distributed to State Energy Offices and tribal nations (among others) and allocated through a myriad of mechanisms to achieve a more equitable energy future. For example, $200 million is devoted to Contractor Training Grants and workforce development efforts. And the IRA provides over $8 billion alone to Home Energy Rebate Programs (HERA and HOMES) that support low-income households to more affordably participate in the clean energy transition and reap the cascading health, comfort, and reliability retrofit benefits (ibid). The IRA plans to take action to reduce pollution, improve clean transit, make clean energy more affordable and accessible, and strengthen resilience to climate change (The White House 2022).

Gender Based Analysis Plus (GBA Plus) considers the impact of diversity and intersecting identities in the effectiveness of government initiatives. Each person has many identities, and this effort considers how multiple identity factors – such as gender, race, ethnicity, religion, age, income, education, disability, etc. – are interdependent and often combined. The Government of Canada has used GBA Plus to develop policies, programs, and legislation since 1995 and notes *"Without GBA Plus, we risk missing or misreading the experiences of a significant portion of the Canadian population and, as a consequence, risk developing policies and initiatives that can inadvertently increase inequalities"* (Government of Canada 2022).

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From the Bottom Up: Community-led Approaches and, Participatory Co-design

Since residential HTR energy users often face overlapping and intersecting vulnerabilities, it is common for any given individual to fall into more than one HTR category (e.g. minority, marginalized, stigmatized, or criminalized groups, see Rotmann 2023). However, as a result of stringent mandates to meet specific cost-effectiveness requirements, utilities are typically only required to prioritize LI customers (Morales and Nadel 2022; Rotmann et al. 2023). Expanding the types of programs beyond LI eligibility metrics would allow program administrators to better engage customers that also encompass other underserved and hidden groups (Rotmann et al. 2023). Mundaca et al. (2023) highlighted several cross-cutting findings for engaging these audiences in their cross-country case study assessment:

- The importance of fostering trust from the outset of an intervention
- The value of collecting psychographic data to inform intervention design
- The key role of pre-testing messaging content for HTR audiences
- The need to consistently incorporate (and follow through on) measurement and evaluation - 84% of included case studies defined a specific behavior intended to change, but only 10% evaluated whether actual behavior change had occurred.

We provide some specific case studies below, from both U.S. and Canadian CEE members, to highlight how some of these findings have been addressed in practice.

Manufactured home residents in Washington. Puget Sound Energy (PSE) first developed the Manufactured Homes Program in 2019 after the utility commission expressed interest in expanding their services to reach vulnerable customer segments (Ashby et al. 2021). In the same year, Washington's "Clean Energy Transformation Act" was signed into law, mandating the state to "*seek to ensure that all customers are benefitting from the transition to a clean energy economy*" (RCW 19.405.10) while working to achieve an electricity supply free of GHG emissions by 2045. The act specifically outlines energy assistance for LI households (RCW 19.405.120) and tribal communities. As a result, there was a clear push for a just energy transition, both internally from utilities and externally at the federal and state level.

Residents of manufactured homes are often considered HTR, as these customers in Washington state typically fall into the low-to-moderate income (LMI) category, and many are also native Spanish speakers. A key factor in the success of this program involved an early research study and barrier assessment aimed at better understanding the manufactured home sector and identifying opportunities and gaps to provide EE solutions (Ashby et al. 2021). Importantly, these early efforts involved a diverse stakeholder group, made up of installation contractors, advocacy groups, regulators, attorney general's offices, and manufactured home associations (ibid). These efforts identified several barriers to program participation, including:

- *Limited customer attention* (i.e. competing life priorities): Manufactured home residents are often less likely to participate in the labor force, and even for those who are employed, taking time off to be present for the installation of energy efficiency upgrades may be an insurmountable obstacle.
- *Rental challenges*: These residents are also often renters, making it more difficult to initiate EE upgrades.

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- *Language barriers*: Many of these residents are native Spanish speakers.
- *Trust barriers*: Low trust of utilities, coupled with skepticism of door-to-door salespeople, result in a large barrier for reaching these customers.

In designing and implementing a successful program that delivers energy savings through customer participation, PSE found that it was key to not only identify these barriers, but to understand the community itself and work with community members to address and overcome them. To address the split incentive challenge, PSE previously offered a free manufactured home duct sealing program and more recently offered rebates to manufactured homes through existing single-family homes efforts (Ashby et al. 2021). To overcome the language barrier, program materials were translated into Spanish and a contractor was hired to help develop Spanish messaging. Notably, these messaging efforts were based on focus groups that were held with Spanish-speaking manufactured homes residents (ibid). To address skepticism around door-to-door canvassing as a method of spreading program awareness, PSE instead turned to their website, social media posts, in-person interactions, a postcard campaign, and email as alternative methods. However, given that only about half of these customers in PSE's service territory had email access, it was also important to go beyond digital-only communications to reach this entire audience.

Overall, the challenges PSE faced with this program are common amongst program administrators trying to better engage underserved customer segments. While program approaches may not be universally transferable across jurisdictions or audiences, these lessons and successes can provide a starting point from which program administrators can tailor future interventions to build trust, consider priority voices and achieve increased program participation.

Indigenous communities in British Columbia. So far, learnings suggest that for priority audiences, building and maintaining relationships with community-based organizations (CBOs) is crucial to build trust and incorporate priority audiences voice in program co-design. This is even more true for Indigenous peoples who face additional stressors due to deep-rooted structural racism and colonization. In some circumstances, collaboration via CBOs may even be one of the only paths for communication (CEE 2024). Cornell (2005) captured key findings related to EE programs on Indigenous populations across the U.S., Canada, NZ, and Australia:

- All four countries are settler societies of predominantly British heritage, and are largely English-speaking societies today; thus, immigrants and Indigenous peoples have become displaced minorities.
- Indigenous peoples in these societies rank at or near the bottom of the scale of socioeconomic welfare. This is largely due to political factors, such as sovereignty or self-rule, capability of governing institutions, and a *"congruence between formal governing institutions and Indigenous political culture"* (ibid). However, in all four countries, rights to self-government and self-determination for Indigenous peoples have been contentious issues that have not entirely been resolved.
- Many Indigenous populations survive not as aggregations of individuals but *"as distinct communities concentrated on remnant lands that have been the keys to their survival and over which they exercise varying levels of control"* (ibid).
- Many Indigenous populations reside in rural communities that are often off-grid and rely on imported diesel fuel to power generators, which not only pose economic, health, and

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environmental risks and challenges, but these communities also have to pay more for delivery fees to receive power from the organizations that originally displaced them.
- Distrust around government programs is grounded in the fact that these entities have been *"altering community energy systems without necessarily gaining prior and informed consent from the affected communities"* for years (ibid).

BC Hydro's "Indigenous Communities Pilot" revealed that these systemic biases pose the biggest barriers to reaching Indigenous customers. From 2017 to 2019, BC Hydro developed and ran this pilot with the purpose of exploring these barriers and developing approaches that might effectively reduce or eliminate those hurdles in order to best deliver DSM programs to this audience (Ashby et al. 2021). BC Hydro found that it was key to work in partnership with Indigenous communities throughout the entire pilot process, not only to bolster program success but also to help strengthen the relationships between the utility and the community. This first involved engagement to understand the communities' needs and interests to help inform pilot activities that would address these barriers, followed by co-design and delivery of these activities. Positioning community leaders and administrators as the messengers themselves helped to address barriers of distrust and encourage engagement among community members. More specific takeaways for enhanced engagement include:

- Presenting EE information at in-person events that included a member of the community as a presenter or co-presenter proved to be a successful delivery method. Sessions centered around a community meal, or that included prize draws for attendees were both effective in boosting participation as well.
- Visiting and setting up pre-arranged meetings at Elders centers and schools was a helpful way to reach Elders and youth within these communities. Storytelling was also used to share information within these communities, building on the oral tradition in Indigenous cultures (Ashby et al. 2021). During these events, Elders began by offering a prayer and reflecting on energy in the community during their youth, followed by a skit performed by community members illustrating how energy is generated and used locally.
- Using visual and practical illustrations was also an effective method to build understanding and interest in energy efficiency, energy use, and costs. For instance, a kilowatt monitor was used in one community to visualize energy use information for various lightbulbs and other small appliances. In another community, infographics were used *"to illustrate electricity use in common appliances and equipment (e.g. TVs) and how dollar savings from small behavioral changes in the home compared to the likes of a tank of gas, a dinner at a restaurant, or a subscription to Netflix"* (ibid).
- Providing EE products, training, and salary to support local installers in conducting these services for their fellow community members proved to be a crucial effort, as BC Hydro found that it was important for community members to have local installers do the work so they "felt they could trust the person coming into their home" (ibid).

In summary, both the PSE and BC Hydro case studies support Mundaca et al. 's (2023) primary call to action to foster trusted relationships above all else. These programs exemplify the benefits of partnering with the community and getting to know the audience and their needs.

The Just Energy Transition in Aotearoa (Indigenous Māori name) NZ

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NZ differs in many significant ways from the U.S. and Canada: it is much smaller and very remote, consisting of two main islands; policy is set by the national government, as there are no states or provinces; utilities have been largely deregulated since the 1990s, although there is a national regulator, the "Electricity Authority"; and the electric grid is already almost 85% renewable. In addition, it has the unfortunate distinction among wealthy countries to have one of the worst-performing housing stocks, highest rates of chronic childhood respiratory diseases, worsening inequality particularly between homeowners and renters, and systemic inequities affecting its Indigenous Māori and Pasifika populations leading to significantly shorter life expectancies and other societal ills (Brabo-Catala et al. 2023; EHEP 2023). Even though there is no national directive to transition the energy system, NZ has signed up to COP29 and has taken a strong policy focus to address energy hardship under the previous Labour-Green Government.

From the Top Down: NZ Government Initiatives to Address Energy Inequity and Hardship

The "Electricity Price Review" (EPR 2019) highlighted some deep, structural, and highly concerning inequities leading to significant energy hardship for over 110,000 households (in a country of about 2 million households), which were predominantly renters, Māori or Pasifika, and had children. Other than the inefficiency and unhealthiness of NZ's housing stock, the report highlighted low affordability, democracy (small consumers not having a say nor insight into their consumption data), and high confusion around billing at some main issues driving energy hardship. Several recommendations arose from this report, that led to further initiatives discussed here: defining energy hardship, establishing a cross-sector energy hardship expert group, developing a network of community-level support services to help consumers in energy hardship, and setting up a fund to help households in energy hardship become more energy efficient (ibid). Energy hardship was defined by MBIE as *"when individuals, households and whānau [families] are not able to obtain adequate energy services to support their wellbeing in their home or kāinga [community]."* They defined energy wellbeing, the ultimate objective to achieve in Aotearoa, as the converse issue and acknowledged that *"individuals' experiences exist on a continuum where there are different levels of energy wellbeing and hardship. Some households may experience intermittent hardship, as there are a range of factors that can quickly move a household into or out of energy hardship."*

The Energy Hardship Equity Panel (EHEP 2023) further elaborated on the underlying causes for energy hardship, summarized the many initiatives run by various agencies in industry, government and the community, and added more recommendations around strengthening government leadership and accountability. These recommendations include: continue programs to improve the health of the home (such as "Warmer Kiwi Homes" (WKH) to improve insulation and EE, and the "Healthy Homes Initiative" (HHI) to reduce chronic respiratory diseases in children); expand energy access and choice (including mandating rules around post-pay access and disconnection); improve energy affordability (including removal of barriers to independent and social energy providers); increase consumer protection (since the report, "Consumer Care Guidelines" have become mandatory); and build community education and action (including by continuing the "Support for Energy Education in Communities" [SEEC] fund further discussed below, and setting up a community-led "Energy Sector Wellness Network" [ESWN]).

From the Bottom Up: Community-led Programs, Participatory Co-Design

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Examples to date of community-centered initiatives to improve health and efficiency of Aotearoa's housing stock were often funded and empowered by Government programs such as WKH or HHI (Rotmann 2021). As taxpayers funded these initiatives, strict eligibility criteria and KPIs were often imposed, thus introducing barriers to many community organizations that were not already highly versed in energy efficiency and housing, and which were struggling with lack of both resources and capacity. This particularly affected highly marginalized, Indigenous, and remote communities (Rotmann 2023). One way the Energy Hardship Team at the policy lead agency MBIE approached this barrier, was by setting up the highly successful and over-subscribed SEEC fund which promoted energy education and behavior change in communities in ways they chose worked best for their whānau [families].

Whānau HEAT kit pilot. SEEC funding was used to improve "Home Energy Assessment Toolkits" (HEAT kits) as were loaned out by public libraries in many English-speaking countries (Rotmann 2018), to tailor them to highly vulnerable, marginalized and hidden whānau [families] in Wellington, NZ. Despite being a common and well-liked program, no other research into these HEAT kits has been published to date. In addition to tailoring the HEAT kit contents via co-design with affected communities, Rotmann and Cheetham (2023) also reached out to community "navigators", provided them with training[3], and developed an "Activity Booklet" aimed at households with 12–14-year-old children that led them on daily 5-10 minute exercises, games, and quizzes to utilize the kits' tools, and furthering their energy education and behavior change journey. The main engagement strategy was resource-intensive face-to-face in-home advice, with pre- and post-interviews and 4-month follow-up phone calls to assess if there was behavioral persistence. Every household who finished the two-week activities and provided the in-home data to the researchers, received a $500 prize package tailored to their needs and that provided solutions for housing-related issues uncovered by the HEAT kit intervention. The research pilot followed the HTR Task co-designed research process (Karlin et al 2021).

The "Whānau HEAT kit" pilot was highly successful (to the extent that further funding was provided to roll them out across the country and with additional audience segments such as remote Indigenous communities, isolated elderly, impoverished student renters, Pasifika church communities, and underprivileged schools):

- **100%** of the 45 pilot households undertook all activities for two weeks and returned the HEAT kits and Activity Booklets, receiving the full $500 prize package
- **100%** have used at least one of the items given as prizes to improve their homes
- **85%** are still thinking about the energy efficiency of their home four months after receiving the kits
- **85%** could recall having more than one conversation regarding energy use within their household or with friends and family
- **90%** indicated they saw a reduction in their energy bill
- **70%** saw a reduction bigger than $50 per month.

[3] Specifically, a modified version of the Home Performance Advisor (HPA) training program that simplified removed a lot of the technical jargon of the more stringent HPA Certification: https://hpa.arlo.co/w/courses/8-healthy-homes-making-energy-work-for-wh%C4%81nau

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Hidden hardship research led by industry. The two largest electricity providers in Aotearoa, Mercury and Genesis Energy funded research into hidden energy hardship that assessed the landscape and identified gaps, constraints and barriers, without duplicating other work (Rotmann 2024). This research focused on collaborating with consumers and communities to gain meaningful insight into the problem facing vulnerable consumer subsegments and co-design potential solutions with the community that the electricity industry could consider. Rotmann (2024) again followed the "Building Blocks of Behavior Change" process, collecting a number of quantitative and qualitative insights during four phases:

1. *Discover Phase:* landscape analysis and stakeholder assessment (informed by a literature review, energy hardship quiz, and hui [workshop] with 39 relevant stakeholders from government, industry, community, and service providers)
2. *Define Phase:* defining target audiences and behaviors - we chose to focus on hidden energy users, falling under marginalized, stigmatized, and criminalized subsegments (this was further informed by a community survey *n=39*; interview with frontline customer care staff *n=14*; and empathy interviews with customers living in hidden hardship *n=16*)
3. *Co-Design Phase:* testing, in partnership with community representatives, content and delivery strategies for community outreach and engagement via a hui with 89 participants, largely from the community sectors that are representing hidden energy users (over 70 actions arose from this hui which the industry took away to prioritize and then check back with the community to ensure they were on the right track, especially following the 2023 winter cyclone and floods in Auckland)
4. *Deploy Phase*: the industry has started to pilot several of the actions such as , including building community partnerships, developing an App, and improving the cultural competency of the frontline-facing customer care staff etc.

Four major themes arose from the research regarding initial work that the energy industry needs to take before jumping to solutions intended to fix ill-understood problems:

1. *Trust is everything* - there is a lot of mistrust in the community due to multigenerational trauma and systemic inequity, and many customers choose to remain hidden due to feelings of guilt, shame, embarrassment, stigma, fear, not wanting to be a burden, or not understanding what help is available. Rebuilding this trust, so that community gatekeepers become navigators that help bring these hidden customers to the light, is the highest priority and takes time.
2. *Listen to the community voice* - too often, 'experts' in industry, government and research jump to conclusions and design top-down interventions based on biased perceptions or ill-informed market research and surveys that rarely ever reach hidden customers, or their communities. To listen to the community voice means going out into the community and actively and empathetic listening is crucial, even if it can be quite uncomfortable.
3. *Stay in your lane* - industry needs to step out of the way and empower the community to do what they know is best for their whānau [families], which includes resourcing them properly and without too many strings attached.
4. *Develop mana-enhancing practices* - mana [respect, status, and influence] refers to both acknowledging and appreciating community mana, and improving their

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own internal cultural understanding and competence by training and employing diverse members from communities who understand the lived experience of highly-vulnerable customer groups.

Conclusion and Recommendations

As the global community embarks on the journey to transition the energy system away from fossil fuels to zero carbon, we have a lot of collective challenges and hurdles to acknowledge and overcome. The biggest one is the fact that our current energy system is anything but just, and to address the deep-seated systemic and structural injustices embedded in it would mean to challenge our current socio-technical, political, and economic paradigms. An important way of starting this journey is to view the energy system policy challenges as a quadrilemma, where the three aspects of balancing economic, political and sustainability goals are viewed through an overarching energy justice lens. Calls from international bodies like the IEA, COP and the Organisation for Economic Co-operation and Development (OECD) to ensure inclusivity of all energy users in the just transition now need to be translated into national policies and programs, including potential changes to the regulatory regime.

An important aspect for achieving this paradigm shift is to center the energy system transition around different priority energy users - particularly those marginalized communities with compounding and intersecting vulnerabilities, and small business and rural customers that have historically been largely underserved. Proper participatory co-design with these communities (rather than simple top-down consultation) is necessary to tailor solutions to actual customer needs. This can only be achieved if strong, trusted relationships are built. Such relationships, however, require substantial upfront lift, as much multigenerational trauma and injustice has calcified justified understandable distrust in authorities and experts. We also have to acknowledge that these communities are hard-to-reach, under-resourced, and often do not have the energy literacy and understanding of the complexities of our energy system (and the system transition we are pursuing) in order to meaningfully engage in it. Our solutions, designed in siloes by “experts” with little understanding of the lived experience of the energy users who they target their interventions at, are often inadequate to achieve real, sustained change.

We need to empower and train community navigators and increase their energy literacy in “train the trainers” models, so they can help their communities understand what a participatory, decarbonized grid actually looks like, and how it can serve them and their needs. We need to ensure that our efforts at a “just, orderly and fair energy transition away from fossil fuels” (COP28) include everyone, especially those voices who remain hidden, ignored or deprioritized. Our community-centered examples and case studies have shown that researchers, industry, and government agencies can be flexible, truly collaborate and co-design solutions, and empower communities for mutual benefit. Trust is everything, and building it will take time and resources. We need to move away from strict KPIs and overly bureaucratic and onerous paperwork, and towards trusting communities to know how to apply funding and other support best to help their most vulnerable members. Listening to the community voice is crucial to avoid jumping to biased and ill-informed top-down decisions, conclusions and solutions. ‘Experts’ ought to listen first and work with community partners to collaboratively identify what help is needed and what tools are most useful to underserved communities. Finally, enhancing mana [power] both internally (e.g., via cultural sensitivity and empathy training, and including inviting

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more diverse voices into the fold within our existing institutions), and in our community partners (e.g., via training and resourcing) will help us to advance on this journey together, rather than in our disparate silos.

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