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Injustice Within Renewable Energy Life Cycles: Can IRENA Offer a Solution?

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Abstract

This paper explores case studies of green colonialism, supply chain injustices, and poor e-waste management within renewable energy life cycles, and investigates how the International Renewable Energy Agency (IRENA) may be the best suited organization to address and mitigate these issues on a global scale. While renewable energy technology is often heralded as the key to a sustainable future, the life cycle of these technologies is riddled with human rights violations and other injustices. To begin with, many of the minerals required for assembling the hardware are mined in unregulated environments, resulting in several injustices such as health and safety hazards for miners, child labor, and insufficient pay and protection for the miners. Furthermore, many manufacturing factories for renewable energy hardware have unregulated emissions, creating a hazardous environment for communities living near the factories. During the construction phase of the renewable energy life cycle, there are many cases of the land required for the projects being stolen from Indigenous populations through force, coercion, or political maneuvering, thus putting more unnecessary burdens on communities who have faced centuries of oppression and marginalization. Finally, at the end of life of the renewable energy tech, the hardware is sent to e-waste scrapyards in low-income countries where human rights violations similar to those seen in the mining industry are commonplace. Over the first decade of its existence, IRENA has had unprecedented success in creating an international community supporting knowledge sharing of renewable energy policy and construction best practices. As a result, it has the collaborative infrastructure and information pathways required to quickly brainstorm and disseminate policies to manage and mitigate these poignant issues surrounding renewable energy. By increasing focus on energy justice, pursuing active collaboration with Indigenous Nations, and encouraging reduced energy consumption in Western countries, IRENA could become a key leader in a globalized energy justice movement that would not only save countless lives and livelihoods, but also help to legitimize renewable energy's promise of a sustainable future.

Keywords: Energy justice, Green colonialism, E-waste, IRENA, Renewable energy, Wind energy

Introduction

While renewable energy technologies hold much promise for reducing global emissions and thus mitigating the harmful effects of climate change, the manufacturing, construction, and decommissioning of renewable development and technology have harmful externalities that have yet to be properly addressed. Moreover, the burdens of these negative externalities, similar to those perpetuated by the fossil fuel industry, are disproportionally felt by communities that are predominantly black, Indigenous, and people of color (BIPOC). From deplorable conditions at mining sites in the Democratic Republic of the Congo (Sovacool et al 2020) to the continued dispossession of Indigenous lands and resources in the name of green energy (Normann 2020; Dunlap 2018), the renewable energy industry is following in the footsteps of the fossil fuel industry by exploiting and oppressing BIPOC communities in the name of progress. These issues are inextricably tied to the global transition towards renewable energy and subsequently need to be acknowledged and addressed on a global scale. As the leading international advocate and policy advisor for renewable energy projects, the International Renewable Energy Agency (IRENA) has the proper foundation to build an international energy justice platform and spearhead efforts to mitigate the harmful and disproportionally felt impacts of the renewable energy industry on a global scale. In this paper, after outlining a few of the major justice issues within the renewable energy industry, I offer three policy recommendations for IRENA's approach to energy justice that would support a more sustainable approach.

Background

Definition of Key Terms

Throughout this paper, I bring up the term green colonialism to describe the effect some renewable energy projects have on Indigenous nations. Green colonialism is a subset of settler colonialism, and to fully understand the former, it is important to adequately comprehend the latter. *Settler colonialism* differs from other forms of colonialism, it is "a structure designed to eliminate the Native via physical and political erasure" (Gilio-Whitaker 2019, 12). Whereas other colonizing models seek control over the Indigenous peoples, lands, and resources, settler colonizers "seek to inscribe their own homelands over Indigenous homelands, thereby erasing the history, lived experiences, social reality and possibilities of a future of Indigenous peoples" (Whyte 2016). Erasing entire nations requires coordination and systematic violence; Indigenous scholar and activist Dina Gilio-Whitaker poignantly points out that "settler colonialism, with its mandate to eliminate the Native, is fundamentally genocidal" (Gilio-Whitaker 2019, 50). However, Indigenous peoples have proven to be resilient in their efforts of survival, despite the fact that settler colonialism is not just a moment in history but "centuries of genocidal policies, treaty violations, illegal land seizures, and environmental catastrophes perpetuated by the […] settler government" (Gilio-Whitaker 2019, 5). Ojibwe scholar and activist Winona LaDuke explains that these oppressive strategies are ultimately "for the purpose of 'developing' the [settler] economies and, subsequently, the 'underdeveloping' of Indigenous communities" (LaDuke 1994, 131). I later explain how green colonialism ties into this structure of settler colonialism.

Another concept I discuss is the *sustainability* of certain systems and projects. It is important to distinguish between the terms "renewable" and "sustainable." Renewable energy is characterized by the fact that the source of energy is un-consumable. Sustainable energy, on the other hand, is energy generation that could be continued indefinitely with little to no impact on the surrounding ecological bodies. For example, hydroelectric dams are often considered renewable energy. However, they are not sustainable, as dams can impact immigration patterns of river life, flood important habitats upstream of the dam, and endanger habitats downstream of the dam by reducing the water supply. A more complete interpretation of sustainability can be drawn from Indigenous teachings and practices or Traditional Ecological Knowledge (TEK). In her article "Traditional ecological knowledge and environmental futures," scholar-activist Winona LaDuke introduces a concept central to the Anishinaabe lifestyle:

> "'Minobimaatisiiwin,' or the 'good life,' is the basic objective of the Anishinabeg and Cree people who have historically, and to this day, occupied a great portion of the north-central region of the North American continent. […] This is how we traditionally understand the world and how indigenous societies have come to live within natural law. Two tenets are essential to this paradigm: cyclical thinking and reciprocal relations and responsibilities to the Earth and creation. Cyclical thinking […] is an under-

> standing that the world […] flows in cycles. Within this understanding there is a clear sense of birth and rebirth and a knowledge that what one does today will affect one in the future, on the return. A second concept, reciprocal relations, defines responsibilities and ways of relating between humans and the ecosystem. Simply stated, the resources of the economic system […] are recognized as animate and, as such, gifts from the Creator. Within that context, one could not take life without a reciprocal offering…" (LaDuke 1994, 128).

The belief in a reciprocal responsibility between humans, non-humans, and the land is not unique to the Anishinaabe people. In her book *Aloha Betrayed,* Kanaka scholar Noenoe Silva describes the Hawaiian concept of "pono," explaining that "in the ancient Kanaka world, pono meant that the akua, (deities) ali'i, kahuna, maka'āinana, and 'āina (land) lived in balance with each other and that people had enough to eat and were healthy" (Silva 2004, 16). The concepts of Minobimaatisiiwin and pono affirm the statement made by Indigenous scholar Dina Gilio-Whitaker, that "the Indigenous world is a world of relationships built on reciprocity, respect, and responsibility, not just between humans but also extending to the entire natural world" (Gilio-Whitaker 2019, 138). This belief system is what I base my translation of sustainability on. To be considered sustainable, a practice or technology must be balanced and equitable throughout all stages of its life cycle for all humans, non-humans, and resources involved. For more in-depth information on TEK and Indigenous perspectives, I encourage readers to explore works by other Indigenous scholars such as Noelani Goodyear-Ka'ōpua, Deborah McGregor, and John Borrows.

Fossil Fuels vs. Renewable Energy

Fossil fuels are characterized by their ability to create energy through combustion. When fossil fuels are burned, in addition to providing energy, they release carbon dioxide and other gases into the atmosphere. Since the mid-20th century, scientists have been raising the question of whether the gases released by burning fossil fuels, referred to as greenhouse gases, contribute to the rapid global warming Earth has been experiencing over the past century. By the 21st century, there was a strong scientific consensus on anthropogenic global warming (AGW), with a 2013 study published in *Environmental Research Letters* stipulating that of nearly 12,000 articles in peer-reviewed scientific literature from 1991 to 2011 that expressed a position on AGW, "97.1% endorsed the consensus position that humans are causing global warming" (Cook et al. 2013). A similar study done in 2021, which analyzed 88,125 peer-reviewed articles from 2012 to the present, concluded that "the scientific consensus on human-caused contemporary climate change—expressed as a proportion of the total publications—exceeds 99% in the peer reviewed scientific literature" (Lynas et al. 2021). With an unprecedentedly strong scientific consensus, it is fair to say that burning fossil fuels does contribute to global warming, and if the global consumption of fossil fuels is not reduced, then the world faces an exponentially intensifying ecological crisis.

Global warming is not the only harmful externality of fossil fuels. The extraction of fossil fuels like coal, oil, and natural gas is often an invasive process that has detrimental effects on the surrounding environment and communities. For example, a common method of coal extraction in the eastern United States is mountaintop removal (MTR), which not only destroys the habitat of countless animal species but also contaminates surrounding rivers and streams that are the main water source for local communities (Kaneva 2010; Boyles et al. 2017). Additionally, the discovery of fossil fuel deposits suddenly made those lands highly coveted, which resulted in another wave of land dispossession from Indigenous peoples in settler states such as the United States and Canada (Fixico 2021; Huseman & Short 2012; Preston 2017). Finally, power plants fueled by fossil fuels have a long history of emitting toxic gases into the atmosphere and dumping toxic byproducts into nearby bodies of water, thereby making living conditions for local communities deplorable (Bullard 1994; Bullard 2005; Pulido et al. 1996). To top it off, these harmful impacts are disproportionally felt by communities who are black, Indigenous, and people of color (BIPOC), so much so that the term "environmental racism" was coined to describe such inequities (Bullard 1994; Bullard 2005; Holifield 2001; Pulido et al. 1996). These issues are just as important as greenhouse gas emissions, and any transition away from fossil fuels should also be a transition away from unsustainable resource extraction, land dispossession, and an unequal share of burdens.

Renewable energy, as mentioned before, is characterized by the process of creating energy through non-consumable natural resources such as the sun or wind. Since renewable energy doesn't involve burning any consumable fuel, there are no emissions involved with capturing the energy. It should be

noted that while there are no emissions related to renewable energy generation, there are emissions associated with the life cycle of renewable energy due to resource extraction, manufacturing of the technology, and the transportation/construction of infrastructure. Some examples of renewable energy technology are wind turbines, solar panels, and geothermal plants. As a consensus on anthropogenic global warming (AGW) has grown over the past few decades, resources have poured into renewable energy research and development, making the technology more advanced and affordable. For example, the average price of solar panels has gone from $4.90 per watt of capacity in 2000 to just $0.20 per watt of capacity by 2020 (IEA 2020). As a result, installed renewable capacity has exploded over the past twenty years, with global solar energy generation going from 1.1 TeraWatts (TW) in the year 2000 to 855.7 TW in the year 2020; and global wind energy generation rising from 31.4 TW in 2000 to 1591.2 TW in 2020 (BP 2020). In the face of global warming, this is a promising trend that should be maintained. In an effort to expedite a global transition to renewable energy, several institutions and organizations have formed initiatives around encouraging and facilitating further installation of renewable energy technology. While most of these initiatives have been subsets of larger bodies such as a sub-department within the International Energy Agency, there has been one international organization created for the specific purpose of supporting renewable energy growth: the International Renewable Energy Agency.

The International Renewable Energy Agency

Created in 2009, the International Renewable Energy Agency (IRENA) made history by becoming "the first intergovernmental organization exclusively focused on renewable energy" (Overland 2018, 336). Starting with 75 initial signatories, the organization's relevance grew rapidly, and by 2013, the members and applicants for membership in IRENA amounted to a total of 161 states (Urpelainen 2015; Mengi-Dincer 2021). The organization is comprised of three main bodies: the Assembly, which is the "ultimate decision-making authority, made up of one representative from each Member State"; the Council, a group "of 21 Member States elected for a two-year term"; and the Secretariat, which "provides administrative and technical support to the Assembly, the Council, and their subsidiary bodies" (IRENA 2021). IRENA's main focus is to serve as a "principal platform for international co-operation, a center of excellence, and a repository of policy, technology, resource and financial knowledge on renewable energy" (IRENA 2021). Since the organization's focus isn't directly funding or implementing projects, it is referred to as an "epistemic" organization or one that deals mostly with knowledge-sharing and collaboration between member states (Urpelainen 2015).

While IRENA is still a relatively young organization, scholars who have written on IRENA generally agree that it has had unprecedented success in its early stages and promises to grow in relevance and impact over the coming years. In their 2015 article in the journal *International Environmental Agreements*, professors Johannes Urpelainen and Thijs Van de Graaf make an early evaluation of IRENA's role in global energy governance. They define IRENA as an epistemic organization and list some of IRENA's main activities, such as "lowering informational barriers and asymmetries, gathering and disseminating knowledge, and comparing and evaluating national regulatory frameworks to identify best practices in renewable energy governance" (Urpelainen 2015, 168). Ultimately, Urpelainen and Van de Graaf conclude that since "IRENA has, in spite of a small budget and the lack of a proven track record, established itself as a major provider of epistemic services to the least developed countries" (Urpelainen 2015, 174), the organization "can be regarded as a success story in institutional innovation" (Urpelainen 2015, 161). Scholars Indra Overland and Gunilla Reischl provide a more recent evaluation of IRENA's role in global energy governance, measuring IRENA's success using the following three questions: What types of representatives do member states send to IRENA meetings, and what does this reveal about how IRENA is seen as an organization? What financing and Human Resources does IRENA have access to? And how often is IRENA mentioned in national energy policy documents? (Overland 2018). Overland and Reischl come to a similar conclusion that IRENA has had impressive early success, noting that in terms of mentions in international energy policy documents, "IRENA has rapidly caught up with the IEA (International Energy Agency) in the renewable energy niche, achieving parity in 2014" (Overland 2018, 348). They also predicted that "renewable energy seems set to grow in importance, and along with it, so will IRENA" (Overland 2018, 348). Finally, scholar Mengi-Dincer, along with professors Volkan S. Ediger and Cagla Gul Yesevi, evaluate IRENA through the lens of social constructivism, focusing on the various norms that IRENA is setting within the

global energy governance field (Mengi-Dincer 2021). They too do not hold back on emphasizing IRENA's importance within global governance, concluding that "IRENA is found to play an important role in developing renewable energy policies worldwide as well as in encouraging its members to embrace a new paradigm for their energy preferences by creating knowledge, shaping behaviors, and changing norms in the global energy system" (Mengi-Dincer 2021, 8).

Justice Issues Within a Renewable Energy Transition

While renewable energy is vital for reducing the impact of global warming, we need to look at the sustainability of these technologies with a critical eye to avoid falling into the same harmful and oppressive patterns that were normalized by the fossil fuel industry. It is easy to rationalize the negative impacts of renewable energy by referencing the urgency of the ecological crisis (and thus the importance of maximizing renewable installations at all costs), but it is essential to recognize that it was that type of thinking that created the ecological crisis to begin with. Greenhouse gases may have been the catalyst that started rapid global warming, but the original cause of our ecological crisis was prioritizing costs over sustainability, rashly acting without thinking of future costs, commoditizing land and resources, and de-mattering BIPOC lives and cultures. Blindly building as many renewable energy projects as possible without considering whether they are done the right way will only set the world up for a different crisis down the road. Therefore, it is imperative that the social justice issues of the fossil fuel industry are left in the past. Unfortunately, the following section shows that, in some ways, the renewable energy industry is still perpetuating these toxic norms.

Green Colonialism

Green colonialism is a recently coined term used to describe how the renewable energy industry, just like the fossil fuel industry, is "intensify[ing] colonial losses of land and rights" of Indigenous populations around the world (Normann 2020, 78). Before getting into the case studies of green colonialism, I feel it is important to explain why green colonialism is wrong. A possible rationalization for green colonialism is that while further land dispossession may not be ideal, it is for "the greater good" of humanity. Professor and scholar Bruce Erickson points out the flaws in this theory by analyzing the title scholars have given our current geological epoch: the Anthropocene. As mentioned in the background section of this article, it is widely accepted that rapid climate change is a direct result of human activity over the past two centuries; hence the geological epoch we are experiencing due to climate change is commonly referred to as "the Anthropocene." As Erickson explains, the term Anthropocene looks to the past and the future: declaring humans as both the cause of the environmental crisis and its solution(Erickson 2018). Erickson also points out that "the Anthropocene […] is dependent upon a universal image of the Anthropos," that is, a white, Euro-centric Anthropos (Erickson 2018, 3). The issue with a universal image of the Anthropos is that it conveniently paints over the existence of non-white humans and depicts the entire human population as a unified entity *equally responsible* for the environmental crisis, which we know to be untrue since the vast majority of fossil fuels were extracted and burned for the sole benefit of white economies such as those of the United States, Canada, and Europe. This is important because the homogenization of humanity and their responsibility for global warming implies that we must all be unified in the strategy for how to go about reversing the effects of the crisis: a strategy that is conveniently designed and implemented for the most part by white governments. This "for the greater good" argument acts as a rationalization for settler governments to "circumscribe Indigenous agency in the interest of a greener future," thus positioning the settler government to further "assert jurisdiction over [the] land, and not just claim it, [which] lies at the heart of the structure of settler colonialism" (Erickson 2018, 4). In short, Indigenous people should not be sacrificed for a solution to a problem that they hardly contributed to in the first place, and no amount of renewable energy capacity will justify the continued oppression and violence against Indigenous peoples. To illustrate my point, I refer to the following two case studies: the Southern Saami tribe in Norway and the Indigenous tribes within the Isthmus of Tehuantepec, Oaxaca, in southern Mexico.

The Saami are an Indigenous people whose ancestral territory spans across Sweden, Norway, Russia, and Finland (Normann 2020, 80). There are several sub-tribes within the Saami, one of which is the Southern Saami, who live across Norway and Sweden. The Southern Saami currently consists of an estimated "population of around 2000 people […] [which] includes approximately 500 native language speakers," and reindeer herding lies at the heart of their cultural heritage (Normann 2020, 80). Over the years, "colonial and state assimilation practices have affected their community,

leaving them with few remaining spaces to strengthen and transfer knowledge, language, and cultural practices, except those generated around herding" (Normann 2020, 80), which has put an even higher importance on the few pasturelands left available for the herders to keep their reindeer. Unfortunately, these mountainous lands have also caught the eye of wind energy developers, and subsequently, "Southern Saami lands have additionally turned into sites of contestation over wind energy development" (Normann 2020, 80). While the Saami insist that building the wind turbines "bring increased human activity, the construction of energy infrastructure, and new road networks that will negatively affect reindeers' pasturelands" (Normann 2020, 81), lawyers representing the renewable energy projects' interests contest "whether or not the wind turbines will deter herding […] thus downscaling the value of Saami knowledge" (Normann 2020, 91). The dismissive air of governments and corporations is not new to the Saami people, but that doesn't make it any less frustrating or painful. In nearly all of the interviews Normann had with Saami people, words like "cultural genocide" and "racism" were used to describe the land dispossession caused by wind turbine projects (Normann 2020, 89). These accusations should not be taken lightly, and if renewable energy projects are pushing cultures on the brink of extinction, then there is nothing sustainable about them.

The situation in the Isthmus of Tehuantepec is no better. The Isthmus has been heralded as having 'the best wind resources on earth' (IFC 2014) and as a result, has seen a huge influx of investors and contractors itching to exploit this suddenly valuable resource. The projects first started in Zapotec territory, the northern region, gaining support from the local and Indigenous communities with promises of "work, social development, and prosperity" (Dunlap 2018, 558). Unfortunately, after the projects were completed, "many of these promises remained unfulfilled, limited and benefited a minority of the populations" (Dunlap 2020, 558). Furthermore, unanticipated negative consequences began to arise from the land-use change, including "altered agricultural and livestock patterns, […] the clearing of animal habitat, compacting of soil for roads, loss of birds, transforming the ground water into concrete for wind turbine foundations, and, finally, leaking oil into the ground, which people claimed contaminated both the ground water and animals" (Dunlap 2018, 559). As the wind sites spread to Ikoot territory in the south, Indigenous communities started putting up more resistance, but to avoid slowing construction, "public consultation was bypassed, instead opting […] for selective negotiations with select regional administrators, elites and social property members" (Dunlap 2018, 559). To make matters worse, projects proposed building windmills on the coast and within the ocean, which is the main source of subsistence for the Ikoot people. During one pilot wind turbine installation, witnesses reported that the first attempt at building a foundation for the turbine "resulted in the mass killing of fish as far as the eye could see" (Dunlap 2018, 560). During his interviews with the Zapotec and Ikoot people, Dunlap also noticed the common comparison of the wind projects to ethnocide and genocide (Dunlap 2018, 550). Similar to the people of the Southern Saami tribe, for the Ikoot and Zapotec people, the combat against the construction of more wind turbines is more than just resistance; it "is conceived as a war devised to 'annihilate' them, which is seen as a generational fight" (Dunlap 2018, 564). For too long, the voices of Indigenous communities like the Southern Saami, Zapotec, and Ikoot have been ignored or silenced through political maneuvering, gaslighting, and violence. For renewable energy projects to be sustainable, Indigenous voices need to be elevated on an international scale, and Indigenous representatives brought into the planning and collaboration circles to protect the rights and well-being of Indigenous lands, resources, and people.

Upstream & Downstream Justice Issues

Besides acting as a potential tool of green colonialism, renewable energy technology itself has many justice and equity issues embedded within its upstream (mineral extraction and manufacturing) and downstream (waste management) processes. Sovacool et al. describe the injustices within these practices as the 'decarbonisation divide' since the benefits and negative externalities associated with the system are imbalanced between Global North and Global South countries (Sovacool et al. 2020, 2). Specifically, Sovacool et al. focus on cobalt mining in the Democratic Republic of the Congo (DRC) since cobalt is a key component of many renewable energy technologies, including wind turbines, battery storage, and e-waste management within Ghana. Upon detailed analysis of mineral extraction in the DRC and e-waste management in Ghana, the researchers identified "environmental and public health risks; gender discrimination and the marginalization of women; child labor and exploitation; and the subjugation of ethnic groups" (Sovacool et al. 2020, 7) as the primary issues. In the cobalt mines, it is common

to see children working "underground, underwater, at dangerous heights, or in confined spaces […] routinely carry[ing] sacks of ore that weigh more than they do" (Sovacool et al. 2020, 14). The mines are unregulated and have no safety precautions, and "many [children] will die before then ever become an adult. They will get buried alive in an underground tunnel, or drowned in a waterlogged pit. […] they can even develop cancer, things like pneumonia, malnutrition, or they start dying from AIDS" (Sovacool et al. 2020, 14). As if the conditions of the mines were not bad enough, "children are also often exposed to physical abuse and bearings, whippings, and attempted drownings from security guards, as well as drug abuse, violence, and sexual exploitation" (Sovacool et al. 2020, 14). Conditions in the e-waste dumpsite in Ghana are no better. Locals interviewed by the researchers report seeing "children sleeping on scrap, eating with e-waste, coughing intensely, [and] bleeding" (Sovacool et al. 2020, 14). Children as young as nine years old pick through the waste and burn it with no protective gear, exposing themselves to toxic chemicals and noxious fumes that contribute to "abnormally high rates of spontaneous abortions, stillbirths, and premature births" in the area (Sovacool et al. 2020, 13). While renewable energy technology does not make up the entirety of e-waste, it promises to exponentially contribute to the global e-waste inventory, with waste from end-of-life solar products alone projected to reach "a worldwide total of 60 to 78 million tons of waste" by 2050 (Sovacool et al. 2020, 4). To put that value in perspective, that amount of waste "would make solar PV waste flows greater than *all* e-waste flows in 2018" (Sovacool 2020, 4).

In addition to injustices and inequalities within mineral extraction and waste management, many renewable energy technologies such as solar panels or wind turbine parts "are manufactured with no environmental or public health regulation in poor Global South communities, exposing the people of color who work solar factory assembly lines and live in factory-adjacent homes to a host of deleterious toxins and pollutants that severely compromise their health and well-being" (Lennon 2018, 23). These issues of exploitation, emissions, and waste within renewable energy technology processes will only worsen as more renewable energy capacity is built. IRENA has estimated that in order to keep global warming within safe levels, "the number of electric vehicles (EVs) needs to jump from almost one million in 2015 to one billion cars in 2050 […]; battery storage similarly needs to climb from 0.5 gigawatt hours (GWh) to 12,380 GWh […] [and] the amount of installed solar PV capacity must rise from 223 gigawatts (GW) to 7122 GW" (IRENA 2018). This massive increase in low-carbon technology puts pressure on the supply chain to produce more products at cheaper rates, which will likely lead to even more cut corners in terms of safety and equity regulations than there are now. We must get ahead of the issue by putting a spotlight on these processes to develop safe, equal, and just regulations throughout all processes of renewable energy technology.

Policy Recommendations

Since its creation, the International Renewable Energy Agency (IRENA) has made a noticeable impact both within global governance institutions and domestically within states around the world. Working as an epistemic organization, IRENA has focused on knowledge sharing between countries and supporting domestic policies that encourage renewable energy projects (Urpelainen 2015; Overland 2018; Mengi-Dincer 2021). As a result, IRENA has established itself, particularly among industrially developing countries, as a valuable and reliable source of knowledge and guidance within the realm of renewable energy policy and projects. However, as the adoption of renewable energy grows, poignant issues surrounding renewable energy projects and technology have also come into the light; particularly issues regarding Indigenous communities' sovereignty (Bohm 2021, Dunlap 2021, Normann 2020, Erickson 2018) and injustices within the upstream and downstream processes of renewable energy technology (Sovacool 2020; Lennon 2018). As the leading international promoter of renewable energy, IRENA has an inherent responsibility to lead the charge in developing policies and regulations to manage and mitigate the aforementioned issues. Currently, the only mention of justice and equality within IRENA's initiatives is found within a new collaborative framework titled "Just & Inclusive Energy Transition," which had its first meeting in May 2021 (IRENA 2021). While the creation of this collaborative framework is certainly a step in the right direction, more must be done to expedite addressing these issues. In the next section, I advocate for the following three policy changes within IRENA: (1) That IRENA create a new initiative dedicated to energy justice within all processes of renewable energy technology; (2) That IRENA actively seek out collaboration with and guidance from Indigenous nations, and work with Indigenous representatives

to develop a fair and equitable management framework for conflict between settler states and Indigenous nations; and (3) that IRENA put more focus on supporting de-growth policies within industrialized nations.

First Policy Recommendation – Create an Energy Justice Initiative

The number of human rights violations and power/benefit imbalances within the renewable energy industry is alarming and addressing them needs to be prioritized. To do this, an Energy Justice Initiative could be created within IRENA that is divided into three sections: upstream, midstream, and downstream processes. Focusing on humane and equitable ways of regulating these processes, the initiative will act as a valuable resource for countries focused on mineral extraction, e-waste management, and manufacturing. It will open funding pathways to areas in most need and put a spotlight on exploitative corporations and supply chain actors within the renewable energy industry. The initiative would also provide a platform for research into conflicts between renewable energy projects and Indigenous populations. Much can be learned when looking at several cases with a broader lens, and up to now, most research on green colonialism conflicts has focused on single cases. There are also examples of renewable energy infrastructure being used as a tool of reconciliation between Indigenous nations and settler states through Indigenous ownership of the energy infrastructure (Baxter & Mang-Benza 2021; Campney et al. 2021). In this way, renewable projects act as a tool that strengthens Indigenous sovereignty rather than dismantling it and may open opportunities to solve conflicts elsewhere. Subsequently, there should be a strong Indigenous presence in the structuring and oversight of the initiative, as explained in the second policy recommendation.

Second Policy Recommendation – Heightened Collaboration with Indigenous Nations

Up to now, the voices and opinions of Indigenous communities on renewable energy have been largely ignored or actively silenced, especially within settler states. It is fair to surmise that a large part of the reason for this is because Indigenous narratives challenge the popularly asserted assumption that more renewable energy capacity is always a good thing. Many "Indigenous peoples have denounced how climate change mitigation through quick fixes and large-scale interventions not only dispossesses them of lands and life systems but also limits how we comprehend the current ecological crises" (Normann 2020, 90). However, the relationship between renewable energy advocates and Indigenous voices does not need to be one of contention. After all, Indigenous activists are behind some of the most influential organizations fighting climate change, such as the Idle No More campaign, the Council of Thirteen Indigenous Grandmothers, and the Summer Heat campaign. Furthermore, as described earlier, Traditional Ecological Knowledge (TEK) offered by Indigenous cultures provides a comprehensive blueprint for sustainable living. Scholar Dina Gilio-Whitaker points out that due to Indigenous people's long history of sustainable living and land management, "it may well be that organizing around Native land rights holds the key to successfully transitioning from a fossil-fuel energy infrastructure to one based on sustainable energy" (Gilio-Whitaker 2019, 149). All this is to say that Indigenous peoples and nations will be a powerful ally in the global transition to renewable energy if they are given the respect they deserve and are involved in the planning, construction, and maintenance of renewable energy projects within their ancestral lands.

IRENA can achieve increased Indigenous representation through direct and indirect means. Firstly, IRENA can increase Indigenous representation within the agency itself. Ideally, Indigenous nations would have the same rights as other nation-states and could simply apply for membership within the agency; however, that is not currently the case for Indigenous nations occupied by settler states and acquiring those rights will take years of negotiating and politics. In the meantime, IRENA has other avenues of achieving Indigenous representation within the agency, such as directly hiring Indigenous employees and inviting Indigenous activists and elders to speak to the assembly and advise collaborative frameworks and initiatives within IRENA. Additionally, IRENA can encourage Indigenous representation on individual development projects by leveraging its influence within the policy making and financing sectors. IRENA's support on policies such as more thorough land use assessments, ecological impact surveys, and increased Indigenous collaboration/ownership could help shift the dominant paradigm of renewable development globally, especially if some of these policies are used as a requirement for receiving funding from the Energy Transition Accelerator Financing Platform (a financing platform managed by IRENA).

Third Policy Recommendation – Encourage De-Growth in High Consuming Countries

A successful transition to sustainable living will require more than just increased renewable energy capacity; it requires a lifestyle change for high energy-consuming states like the US and countries within the EU. According to the International Energy Agency (IEA), the annual electricity consumption (in kWh per capita) of the US, Canada, and the collective EU in 2014 was 12,994; 15,588; and 6,022, respectively (IEA 2014). Compared to the consumption of less industrially developed countries like Ethiopia and Vietnam, 69 and 1,424 respectively (IEA 2014), the consumption of the Euro-centric countries is beyond gluttonous. Part of the vision of a sustainable future is better parity of energy access and consumption across the globe, and it is unrealistic to believe that the world can sustain a global average electricity consumption greater than 6,000 kWh per capita per year (the world average in 2014 was 3,131), let alone 15,000 kWh per capita (IEA 2014). Even without taking the issue of energy consumption parity into consideration, the cyclical nature of renewable energy capacity requires a shift in the way high energy-consuming communities use energy; and the higher the energy use, the harder it is to make the necessary shift. Subsequently, in addition to promoting renewable energy, IRENA should also promote policies geared towards degrowth in countries with high energy consumption. As this doesn't necessarily involve all the members of IRENA, it may best be achieved through a collaborative framework where high energy-consuming countries can brainstorm methods to cut down on their energy consumption and agree on annual energy consumption targets for the near future. IRENA could also help with energy audits of countries, finding their highest sources of energy consumption and targeting energy use reduction in those areas for greatest impact.

Conclusion

While renewable energy does have great potential to mitigate climate change issues, a blind faith in the positive impact of renewable technology "ignores the necessity to consider degrowth in those same Enlightened (and colonial) nations; the spread of electrical dependence of people; the mining necessary for it and the different ontologies and ways of life that reject this form of development" (Dunlap 2021, 5). As long as renewable energy technology is manufactured, installed, and disposed of in a way that continues the historic trend of devaluing BIPOC communities, the sustainability of these technologies is put into question. Ignoring the rising energy justice issues surrounding the renewable energy industry would be to repeat mistakes from the past and would surely result in more crises down the line; therefore, the best way forward is to face these issues head-on. The rapid growth and early success of IRENA as an international collaboration organization for promoting renewable energy development foreshadows the influential role IRENA and renewable energy will play within global energy governance in the coming years. The combination of IRENA's existing international collaborative infrastructure and their rising significance within global energy governance puts IRENA in a unique position to lead the world in an energy justice movement—to develop just and sustainable solutions to these issues and disseminate learned practices across all nations. IRENA has done well to recognize this potential by creating the Just and Inclusive Energy Transition collaborative framework but needs to push harder for more centralized action. Specifically, IRENA should create an initiative dedicated to energy justice, actively pursue collaboration with and the integration of Indigenous peoples and nations within IRENA, and focus on promoting reduced energy consumption in high consuming countries. With these policies, IRENA could revolutionize how renewable energy is managed on a global scale.

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