Summary IEA-EGRD Workshop: Social Impacts of Clean Energy Policies

The IEA-EGRD Social Impacts of Clean Energy Policies Workshop is a collaboration between the IEA workstream on people-centred clean energy transitions and the IEA Experts' Group on R&D Priority-setting and Evaluation (EGRD) to explore existing research assessing social impacts of clean energy policies and discuss future research pathways. EGRD is an informal expert group that have advised the IEA Committee on Energy Research and Technology (CERT) on energy topics important to accelerate the energy transition for over 25-years. It examines analytical approaches to energy technologies, policies, and R&D as well as promotes dialogue and information exchange on methodologies and approaches related to technology assessment, priority-setting, and evaluation.

The two-hour online workshop on 23 May 2023 was dedicated to clean energy policies that have a focus on targeting low-income households or reducing inequalities.

In her scene setter presentation, Angela Picciariello, Senior Researcher at the International Institute for Sustainable Development (IISD), presented IISD's findings included in the 2022 report 'In Search of a Triple Win: Assessing the impacts of COVID-19 responses on the clean energy transition, inequality, and poverty analysis', which aimed to understand which energy policies can lead to "a triple win", namely positive outcomes on climate, poverty and inequality. This research was grounded in IISD's Energy Policy Tracker Inequality and Poverty dashboard, a database that tracked energy policies put in place by 30 governments during the pandemic between January 2020 and November 2021. Key findings from their work included:

- While governments have clear ideas on ways to design policies to reduce carbon emissions, knowledge is lacking on designing these policies to maximise positive outcomes on inequality and poverty.
- The poverty and inequality effects of energy policies tend to be assessed in the short term without sufficient attention to their medium and long terms effects, which are likely to vary over time.
- Contextual factors are to be taken into consideration to design socially progressive energy policies. For instance, government support for the purchase of households' renewables can increase poverty in the context of fully electrified high-income countries where residential renewable installations will increase the electricity tariffs paid by lower income consumers. However, it may decrease poverty in lower income countries, where these measures are targeted at non-electrified, rural areas, increasing energy access while providing a number of economic opportunities to lower income consumers. Similarly, the social impacts of energy efficiency retrofitting policies in buildings will depend on the income level of households that can access subsidies for these retrofits.
- Several policy design elements of clean energy policies can mitigate negative social outcomes. For instance, policy design elements such as targeted incentives for low-income

groups (including cash transfers and loans) or including economically vulnerable groups in the design of clean energy policies, will likely lead to positive outcomes on poverty.

- Implementing broader complementary policies can enhance existing positive social outcomes or mitigate negative social outcomes. For example, additional skills training policies for workers affected by clean energy transition policies will help mitigate negative employment outcomes on lower-income workers affected by the transition.

In the workshop's first session on 'Evaluation of energy efficiency programmes targeting energy poverty and low-income households', Anna Realini, Researcher at the Ricerca sul Sistema Energetico (RSE SpA), presented on the correlation between energy poverty and health, based on a RSE SpA study designed to estimate the health impact of energy poverty in Italy and its financial implications. Using the City of Turin and Piedmont, its surrounding region, as a case study, the research found a higher incidence of specific health issues, including premature death, cardiovascular diseases, heart attacks, cerebrovascular and respiratory diseases in parts of the city with the largest number of energy poverty affected households, which tend to be the poorest areas in which most of the social and residential housing blocks were built inadequately during the 50s-70s financial boom to cater for the city's blue collar workers. They also calculated that the cumulative hospitalisation excess costs to the Piedmont region of treating pathologies due to energy poverty was €24M per year, which could be reduced through renovation and energy efficiency improvements of buildings from energy poverty households. Anna noted that the current Italian energy efficiency funding system is not effective in allowing consumers affected by energy poverty to pursue energy efficiency improvements.

In the session's second presentation, Mariana Weiss de Abreu, Energy Research Analyst at the Brazilian Energy Research Office (EPE) explained that understanding the heterogeneity of households' energy consumption is required to design energy efficiency programmes that aim to mitigate energy poverty and socioeconomic disparities, which can be difficult in developing countries like Brazil where there may be a lack of disaggregated data on households' energy consumption. She then presented EPE's new research focused on understanding residential electricity consumption by income classes to help identify vulnerable groups and develop monitoring indicators that will contribute to the design and implementation of energy efficiency programmes successfully addressing energy poverty. The initial results of this research found that income distribution inequality is reflected in the households' electricity consumption patterns with the richest households in Brazil consuming around six times more electricity than the poorest ones in the country. Lower income households tend to present fewer home appliances with lower power or more restrictive usage habits to spend less money paying their electricity bill. Under this research, EPE also developed an Electrical Gini Index, a powerful tool to monitor inequality in access to energy services, which collects periodical data on the ownership, power and use habits of home appliances by income classes, regions and other household conditions. According to Mariana, understanding the residential sector's electricity consumption heterogeneity by income classes can help design more effective and less expensive energy efficiency and subsidy policies as well as improve energy demand forecasting models and energy planning.

In the workshop's second session on 'Evaluating the social impact of renewable energy programmes', Kate Anderson, Strategy Lead at the National Renewable Energy Laboratory (NREL),

presented the study 'LA 100 Equity Strategies', in which NREL partnered with the Los Angeles Department of Water and Power (LADWP), the city's main utility, which is committing to achieve 100% renewable electricity by 2035 while also improving equity in this transition. This is particularly important in the context of Los Angeles County, which is home to 30% of California's population living in poverty. The study, due to come out in July, is organised around three tenets of justice: procedural justice, distributional justice and recognition justice. Kate stressed the importance of consultation and engaging the local community in decision-making and policy processes to successfully design equity transition strategies. This has been at the heart of 'LA 100 Equity Strategies' through several community outreach programmes set up throughout the research process, including steering and advisory committees with representatives from community organisations as well as from different City Departments, and consultation sessions with locals to identify the priorities of neighbourhoods across the city. Based on this engagement, the study presents different pathways and implementation strategies that address these communities' priorities. These include developing low-income energy bill stability to lead to more affordable rates and utility debt relief, solar and efficiency access solutions for renters and multi-family households, increasing truck electrification to produce cleaner air and better health outcomes for disadvantaged LA communities that often live near major highways, as well as opportunities for new clean energy jobs and workforce development. Some of the key takeaways from the study so far are that equitable implementation requires long-term utility-community partnerships, and that current baseline investments in clean energy are inequitable requiring a major shift in the way investments are allocated.

In the session's second presentation, Dr. Festus Boamah from the University of Bayreuth presented on the social impact of renewable energy programmes in Africa. In the African context of predominantly state-controlled, centralised provision of electricity, while decentralised solar energy systems seem to provide great energy access opportunities, they also present several disadvantages from an energy justice perspective. Existing regulatory frameworks may not incentivise distributed generation and may impose restrictions on the amount of power that can be exported to the grid, hindering the growth of decentralised solar energy systems. The affordability of decentralised solar energy systems can also be a challenge. Financing mechanisms and reduced prices of storage batteries are needed to make these systems more cost-effective and efficient. Financial constraints and the cyclical challenges of grid-based electricity distributors can also hinder the implementation of decentralised systems. Finally, the desirability of decentralised solar PV systems in Africa depends on the fulfilment of contextual conditions. This includes substantial funding and technical support, reduced battery prices, improved financial strength of power sector agencies, commitment to low-carbon energy solutions, and understanding local economic circumstances and public perceptions.

In the final discussion, participants reflected on research areas in which they saw the largest knowledge gaps to help incorporate social impacts more systematically into clean energy policy design, including:

- Understanding the socio-economic impacts of energy policies, such as energy subsidies, not only in the short term but also long-term impacts on vulnerable consumers.

- Understanding how to create sustainable energy systems more broadly, not only through subsidies and price mechanisms but also procedural fairness and regulatory problems to ensure equity outcomes.
- Moving away from top-down design of energy policies by engaging local communities in policy and decision-making processes to better understand their needs and ensure they feel engaged in the energy transition.
- Developing communities' awareness of the environmental impacts of their energy consumption through education and to ensure they have a better understanding of newly implemented energy policies.
- Identifying vulnerable population groups, target the development of new energy technologies to ensure these groups benefit from it, as well as target those groups with energy efficiency programmes to reduce the cost of their energy consumption.
- Developing tariff structures to address different income levels, especially with regards to renewable energy provision.

In her concluding remarks, the EGRD Chair mentioned that: putting people in the centre of the energy system is fundamental to a just transition and a pre-condition to its success. In this respect, she considered that the workshop provided important perspectives on this challenging topic including:

1. Context and time matter. Policies matter! But what may have a positive social impact in high-income economies may not work in middle or low-income economies or for that matter between urban and rural areas or between low-income and high-income households.
2. We need more knowledge and tools to explore the social impacts of clean energy policies. After all we have to explore the challenges before policy makers can design socially effective clean energy policies.
3. International cooperation matters, not least exchange of best practice and include these perspectives in relevant TCPs.