



Key Policy Design Considerations for Affordable and Fair Transitions

Global Commission on People-
Centred Clean Energy Transitions

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International
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INTERNATIONAL ENERGY AGENCY

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The Global Commission on People-Centred Clean Energy Transitions: Designing for Fairness, convened by IEA Executive Director Dr. Fatih Birol, is co-chaired by Alexandre Silveira de Oliveira, Brazil's Minister of Mines and Energy and Teresa Ribera, Spain's Deputy Prime Minister and Minister for the Ecological Transition and Demographic Challenge. It comprises energy, climate and labour leaders from governments around the world, along with high-level representatives from international organisations and labour, Indigenous, youth and civil society groups.

2024, G20 Ministerial meeting, Foz do Iguaçu, Brazil.



Key policy design considerations for affordable and fair transitions

Introduction

On April 26, 2024, the IEA hosted its inaugural Global Summit on People-Centred Clean Energy Transitions. Leaders from around the world gathered at the IEA headquarters in Paris to discuss key issues at the heart of clean energy transitions. Recognising the critical role that policy design plays in achieving people-centred and fair outcomes, the IEA Executive Director announced the creation of the new Global Commission on People-Centred Clean Energy Transitions: Designing for Fairness. The Commission is co-chaired by Teresa Ribera, Spain's Deputy Prime Minister and Minister for the Ecological Transition and Demographic Challenge, and Alexandre Silveira de Oliveira, Brazil's Minister of Mines and Energy, and comprises energy, climate and labour leaders from governments around the world, along with high-level representatives from international organisations and labour, Indigenous Nations and Peoples, youth and civil society groups.

The new Global Commission builds on the work of the 2021 Global Commission on People-Centred Clean Energy Transitions that brought together, key voices, to examine the social dimensions of clean energy transitions and to identify the key elements of what will make transitions truly people-centred, fair, and inclusive ([IEA, 2021](#)). The 30 members developed a series of recommendations (see Annex) that are set out in four categories:

- Decent Jobs and Worker Protection
- Social and Economic Development
- Equity, Social Inclusion, and Fairness
- People as Active Participants

The IEA also published a Global Observatory, a set of over 100 case studies that were identified as best practices and illustrative measures and considerations necessary to deliver the recommendations effectively ([IEA, 2024a](#)). The new Global Commission on People-Centred Clean Energy Transitions: Designing for Fairness will take forward this work to examine in more detail how to enact these principles through policy design and implementation. The work will draw on

cases and experiences of the Commission members and will aid other decision makers as they seek to prioritise affordability and fairness in their clean energy policies.

The recently-released IEA report *Strategies for Affordable and Fair Clean Energy Transitions* examines for the first time the affordability aspects of clean energy transitions, with a particular focus on the inequities in energy consumption and expenditures across households and regions ([IEA, 2024b](#)). The analysis shows that the Net Zero Emissions by 2050 (NZE) Scenario's 1.5 °C pathway is less costly on a global basis than a pathway based on today's policy settings, as a result of lower running costs of a rapidly decarbonising energy system. This analysis takes into consideration all costs of delivering energy, including capital expenditures, operating expenses, the need to pay back previous investments and financing costs.

However, making this shift to a clean energy system requires major investment by governments, businesses, and households. One chief concern for policy makers is ensuring such investments increase affordability, and access, of energy services and technology for all, not just for select parts of the population or the world. 'Designing for fairness' focuses on the question of how the design of policies to drive clean energy transitions can deliver greater affordability, optimal distribution of benefits and costs, and more equity in energy systems.

While energy systems are undergoing structural transformations, there is an opportunity to bring people in from the margins of the energy economy and improve lives and well-being, including by expanding energy access, creating jobs, reducing energy bills, providing better air quality and healthier homes, and empowering communities to own and manage power systems locally. At the same time, the scale and scope of these transitions requires broad support from societies. If policies are perceived to only benefit those who can afford new technologies or to harm workers and communities, the public will not support these transitions, and they will not be successful.

The potential for energy transitions to enhance people's quality of life and livelihoods is increasingly recognised at the global level. At COP28, nearly 200 governments reached a historic agreement to triple renewable energy capacity, double the rate of energy efficiency improvement and substantially reduce methane emissions by 2030 in order to keep within reach of the Paris Agreement target of limiting global warming to 1.5°C. Doubling energy efficiency improvements alone has the potential to cut energy bills by a third in advanced economies and create 4.5 million jobs by 2030 ([IEA, 2023i](#)).

As international momentum towards cleaner and more efficient energy systems builds, and in the wake of the ambition agreed at COP28, the focus is increasingly turning to implementation. Implementing clean energy transitions in

practice requires adequate financing, especially to reduce the cost of capital and support clean energy deployment and capacity building in emerging and developing economies. Clean energy transitions will also look different in every country and the impact they will have on different population segments will vary based on how policies are designed and targeted. In this time of transformation, countries require a context-specific understanding of what challenges exist and how to address them, but they can also learn from each other through the exchange of best practices and dialogue.

In this paper, members set out seven key questions on affordability and fairness in clean energy transitions, laying out some of the crucial issues that policy makers are trying to address.

They are:

1. How to realise decent jobs for workers in clean energy transitions?
2. How can social inclusion be integrated into workforce development policies?
3. How to deliver universal access to affordable energy as part of clean energy transitions?
4. How can policies ensure low-income and marginalised communities are able to afford clean energy technologies?
5. How to ensure clean energy policies maximise socio-economic benefits?
6. How can policy design determine the fair distribution of benefits and costs?
7. How to put meaningful participation of all stakeholders at the heart of clean energy transitions?

Focusing on these questions, the paper presents selected best practices from various countries to demonstrate how these challenges can be overcome.

This paper is the first output of the Global Commission, and it is being released at the invitation of Minister Silveira to provide input into G20 energy deliberations. The Commission will begin a second phase of work in October 2024, to align with COP30, hosted by Brazil, which is planned to have a strong focus on social and just transition issues. During the second phase, members will collaborate to develop an implementation roadmap, outlining available policy tools and options for policy makers and international stakeholders to address the seven key questions. This second phase of the Commission will also provide an opportunity for members to explore metrics to assess the effectiveness of implemented strategies and policies.

Key points

1. How to realise decent jobs for workers in clean energy transitions?

Strengthening processes to ensure that workers and employers fully participate in planning of clean energy transitions is a key component in supporting workers and communities in transitions and ensuring that the workforce is adequately trained to respond to future skills demand. National-level just transition frameworks as well as local context-specific initiatives and wider labour market policies are all important.

2. How can social inclusion be integrated into workforce development policies?

Clean energy transitions can benefit diverse populations by creating economic opportunities, leading to enhanced equality and improved quality of life. The benefits are maximised when social inclusion considerations, including increasing labour market access for traditionally under-represented and marginalised groups, are a central part of policy design and implementation.

3. How to deliver universal access to affordable energy as part of clean energy transitions?

Many people still lack access to energy and the benefits that come with it. An even greater number do not have access to clean cooking technologies, disproportionately affecting women and children's health. Improving affordable energy access should be a core imperative in all clean energy transitions.

4. How can policies ensure low-income and marginalised communities are able to afford clean energy technologies?

Policies that are specifically designed to increase broader participation in the clean energy economy, whether through targeting low-income households or focusing on technologies that are more widely used and accessible, will lead to more acceptance and uptake from all parts of society.

5. How to ensure clean energy policies maximise socio-economic benefits?

Clean energy policies can create broader socio-economic benefits beyond the energy sector, including better health or new sources of income for households. When policies are designed with this in mind, they can also contribute to addressing existing inequalities.

6. How can policy design determine the fair distribution of benefits and costs?

Identifying and monitoring the impact of policies on different groups is essential to adjusting policy design and creating complementary policies that ensure benefits are fairly distributed.

7. How to put meaningful participation of all stakeholders at the heart of clean energy transitions?

The active participation of all stakeholders in clean energy policy planning is key to the design of transitions, to their acceptability, and to their effective implementation.

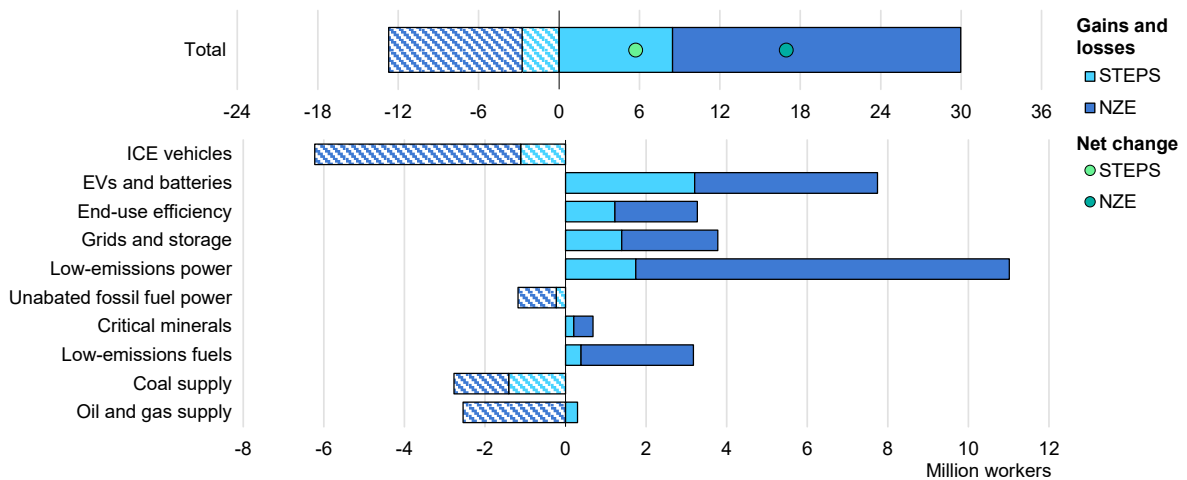
1. How to realise decent jobs for workers in clean energy transitions?

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The energy sector employs over 66 million people worldwide, and changes to this sector are already having a significant impact on workers and communities (IEA, 2024c). There are now more clean energy jobs than fossil fuel jobs. According to IEA projections, up to 30 million (gross) new clean energy jobs will be created by 2030. This expected growth will be in sectors including solar PV, wind, electric vehicles (EVs) and battery manufacturing, heat pumps, and critical mineral mining.

In both advanced and emerging market and developing economies, workers in the energy sector tend to earn more compared to the broader economy (IEA, 2023a). Although clean energy transitions are expected to result in substantial net job creation (up to 17 million), 13 million jobs are expected to be phased-out in the fossil fuel sector over the next decade. Some communities may be severely affected by the local phase-out of their industry, especially in the case of coal regions and communities where coal is the main source of income (IEA, 2024d).

Changes in global energy employment by sector and scenario, 2022-2030



IEA CC BY 4.0.

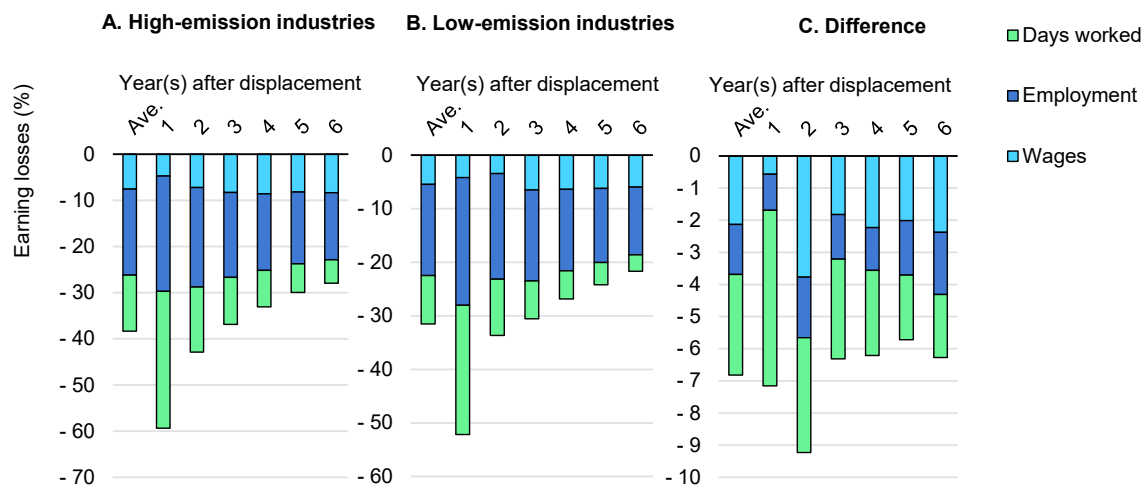
Notes: Critical minerals include only extractive activities. EVs = electric vehicles, ICE = internal combustion engine vehicles. STEPS = Stated Policies Scenario. NZE = Net Zero Emissions by 2050 Scenario.

Source: IEA (2023a), [World Employment Report](#).

Place-based analysis and long-term planning are essential to delivering better outcomes for workers. Understanding the landscape for these workers allows governments to put in place policy tools to help support them and their communities as they transition to new employment. For example, new analysis by the OECD tracks outcomes for displaced workers in high and low-emission sectors¹, in terms of their success in finding new employment and the comparative remuneration of that new employment ([Barreto et al., 2024](#)). Workers in high-emission industries, who tend to be older, with jobs that are relatively well-paid, can experience a loss of earnings (a combination of employment, days worked and wages) around seven percentage points greater than those from low emission industries.

¹ For a complete definition please refer to the [OECD Employment Outlook 2024](#).

Differences in earnings losses reflect larger wage losses, fewer days worked as well as longer spells out of work for workers displaced from high emission sectors



IEA. CC BY 4.0.

Note: Ave.= Average.

Source: Barreto et al. (2024), "Job Displacement in high-emission industries: Implications for the net-zero transition", in *OECD Employment Outlook 2024: The Net-Zero Transition and the Labour Market*.

This analysis also shows two important and related trends looking across countries, that highlights the need for long-term planning and intentional policy design to maximise positive outcome for workers. First, there is a relationship between the outcomes for workers and the wider context of unemployment rates in the country. Secondly, and importantly, outcomes for workers are better in countries with more robust labour market conditions and active labour market policies. In other words, active labour market policies like targeted incentives, support for new market entrants, internships, training and upskilling, and job-search assistance can play an important role in supporting workers in transition. Income-support schemes for those out of work, such as unemployment insurance and social assistance, can help mitigate the earnings losses of workers who have lost their jobs. Policy makers can improve outcomes overall by strengthening these policies and wider labour market protections. They can also create specific institutions and programmes to support local just transition solutions in specific areas or sectors, as the following section outlines. In addition, fostering collective bargaining and social dialogue can be key in driving positive outcomes and improving working conditions for high-emission workers transitioning to low-emission sectors. The OECD analysis suggests that low-emission sectors are less well represented in collective bargaining and social dialogue.

A targeted and localised approach that relies on close consultation with affected communities can help select the appropriate interventions to improve outcomes. Spain has developed a comprehensive set of policies to mitigate the socio-economic impacts of the closure of its coal mines and coal-fired power plants.

The Spanish government published a Just Transition Strategy in 2019 and established a Just Transition Institute in 2020, which has focused its efforts on reskilling workers, promoting clean energy jobs, and supporting affected communities through the framework of Just Transition Agreements (JTAs) ([Instituto Para La Transición Justa](#), 2022). The agreements start with a socio-economic impact assessment to define the geographical scope, focusing on areas most affected by coal facility closures. The process includes evaluating the relative impacts on local employment and wages and considering cumulative impacts of previous closures. Data on affected workers and their municipalities are collected to identify and support the most impacted regions. This is complemented by extensive public participation processes in which local stakeholders can contribute with proposed measures and ideas to maintain employment through targeted support in these identified areas.

This tailored approach helps promote diversification and context-specific plans consistent with the socio-economic context of each affected territory. As a result of these agreements, various support instruments have been established, including initiatives for new industrial projects, clean energy facilities, and the growth of Small and Medium Enterprises (SMEs). Additionally, retraining programs for skills development in clean energy, as well as social assistance for displaced workers, have been introduced. Engaging labour unions in discussions has also fostered businesses' commitment to help attract new projects to the concerned territories, retrain coal workers in clean energy occupations and assist them with their job relocation.

Supporting the productive reconversion of areas where industries are being phased out is a key component of these processes, to ensure worker retention and stimulate economic diversification in affected communities. In a former coal region of Romania where mine closures led to the departure of nearly half the area's population, the Romanian Wind Energy Association focused on retraining displaced workers by developing a professional training academy to train 8 000 technicians over ten years ([IEA](#), 2023b).

Various policy tools, including financial support and incentives, can help ensure that workers have access to training. For example, Germany recently introduced a skills development benefit scheme, which provides benefits to companies undergoing restructuring that retain employees through skills development initiatives ([Federal Ministry of Labour and Social Affairs](#), 2024a). A second scheme ensures that employees impacted by restructuring have the option to change employers and receive financial support to pursue education and training suited to their new task or position ([Federal Ministry of Labour and Social Affairs](#), 2024b).

National levels just transition frameworks are key to ensuring that the transition is inclusive, fair, and equitable. They outline a comprehensive set of policies and measures that protect workers' rights, provide up-skilling and reskilling

opportunities, support communities impacted by the transition away from fossil fuels, and help mitigate any potential negative consequences. A central component of these frameworks is active participation of stakeholders in planning and implementation.

A new analysis by the Just Transition Finance Lab of the London School of Economics examined 159 just transition policies and laws across 61 countries plus the EU. Of all policies reviewed, 70% were public finance levers including social protection interventions, tax reform and procurement measures and 60% related to institutional planning such as the establishment of task groups or publication of specific action plans ([Chan et. al, 2024](#)). Less than half (40%) made specific mention of participation and social dialogue processes. The report highlights the need for country-specific just transition frameworks to provide guidance to private and public financial institutions on where and how funds are needed. This finding aligns with the more positive outcomes that are achieved by countries and regions that are engaged in long-term policy planning around transitions.

In November 2023, the International Labour Organisation (ILO)'s 187 member countries endorsed the 2015 Guidelines for a Just Transition Towards Environmentally Sustainable Economies and Societies for All, crafted by governments, workers and employers ([ILO, 2016](#)). These guidelines provide a comprehensive framework to support stakeholders in managing structural changes towards building greener economies while achieving fair outcomes. They emphasise employment-centred macroeconomic policies, targeted environmental regulations for industries and sectors, decent jobs and social protections for workers, skills development, and social dialogue. Many countries have incorporated the principles of this landmark document into their national clean energy transition policies and strategies for climate action, including the EU Just Transition Mechanism, which helps mobilise around EUR 55 billion over 2021-2027 in regions most affected by the transition ([European Commission, 2024a](#)).

To meet future clean energy workforce demand, tailored skills development programmes are essential for upskilling and reskilling workers, and to prevent job losses for workers transitioning from fossil fuel industries. Given the widespread skills shortages in clean energy transitions, short-term and long-term planning is required to create robust national strategies that address future workforce needs ([IEA, 2023a](#)). This includes skills development programmes that are agile and adaptable to changing sector requirements, and specific mechanisms that can be implemented to build talent pipelines. This can also involve the identification of transferable skills to ensure that jobseekers are fit to work in a variety of clean energy jobs, and establish parallel skills mapping for workers who can more easily re-skill to specific jobs in the clean energy sector given their previous experience.

2. How can social inclusion be integrated into workforce development policies?

Key message: Clean energy transitions can benefit diverse populations by creating economic opportunities, leading to enhanced equality and improved quality of life. The benefits are maximised when social inclusion considerations, including increasing labour market access for traditionally under-represented and marginalised groups, are a central part of policy design and implementation.

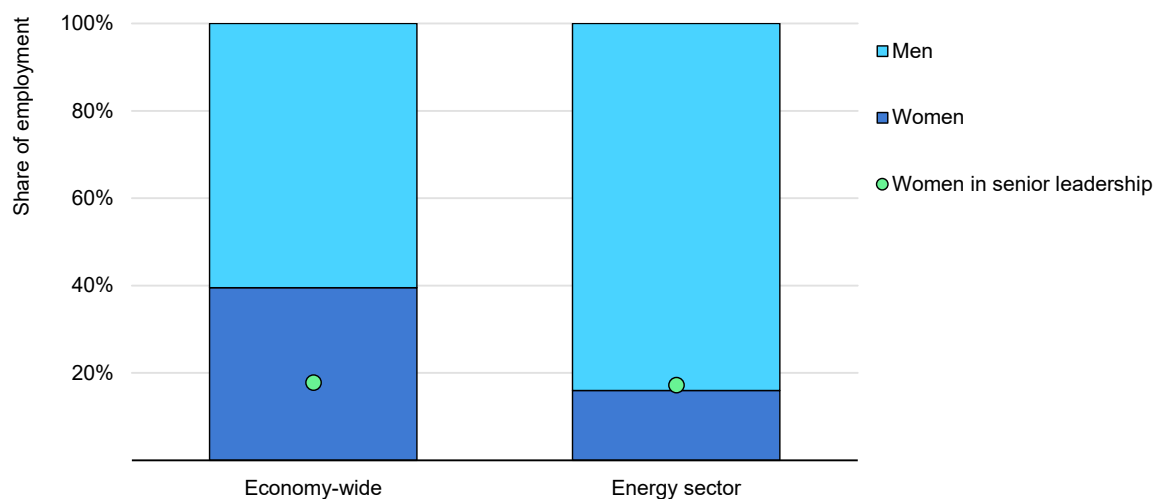
Millions of workers need to be trained, upskilled or reskilled to take advantage of the new jobs and careers created by clean energy transitions and address ongoing labour shortages in key sectors including construction and other essential trades ([IEA, 2023a](#)). The energy workforce tends to require higher skill levels than the broader workforce as many jobs require technical and specialised skills. New and existing educational, certification and vocational training programmes will need to evolve to meet the labour market demand. Targeting these programmes to prioritise new pathways into the clean energy workforce is essential both to prevent labour shortages and to ensure that the clean energy workforce is more diverse and provides equitable opportunities.

Women are considerably underrepresented in the global energy workforce ([IEA, 2024e](#)). While women comprise 39% of the overall global workforce, they account for less than 20% of energy workers. There is also a significant gender wage gap in the energy sector with female employees earning almost 20% less than their male counterparts. This figure accounts for the effects of skill composition in terms of ability, education, and potential experience, which suggests the difference may be attributed to systematic and cultural biases as well as discriminatory practices. The wage gap is highest in high-skilled occupations, with women earning 23% less on average. Clean energy sectors tend to have more women in senior leadership positions, yet female representation in STEM education and vocational education training, especially for trades occupations, still lags significantly.

In Chile, the *Energia+Mujeres* programme is a public-private partnership that has gathered over 120 companies and industry associations and institutions in representing 26 000 workers to promote greater gender diversity in the energy workforce ([IEA, 2023c](#)). In 2022, the Ministry of Energy reported that around half

of the private companies and organisations involved had introduced paid parenting leave for the primary carer and that the number of women in senior leadership positions increased while the gender pay gap decreased.

Global employment by gender, 2022



IEA. CC BY 4.0.

Notes: Employment shares are from the International Labour Organization (ILO) covering 48 countries for the energy sector. Senior management shares are IEA calculations based on the Refinitiv PermID database.

Source: IEA (2023a), [World Employment Report](#).

Providing equal pay, equal leadership and equal opportunities is an integral part of a just and inclusive transition. Promoting equality can also be linked to social, environmental and economic development. According to the ILO, companies with greater gender balance on their boards experience better business outcomes by nearly 20% ([ILO](#), 2019a). The United Nations (UN) also estimated that closing the workforce gender gap could increase GDP per capita by up to 20% ([UN Women](#), 2024).

Training programmes for women demonstrate how inclusive practices result in multiple benefits. In India, the Mahila Housing Sewa Trust (MHT) trains women from rural and low-income communities to become energy auditors ([Chandramouli](#), 2019). They go door-to-door advising households in poor areas how to save money and make homes more energy-efficient by updating their lighting and devices. MHT has trained nearly 13 000 women who have conducted over 28 000 energy audits to date. In addition to the gains of women in the workforce, the programme has saved families over USD 700 000 in electricity costs.

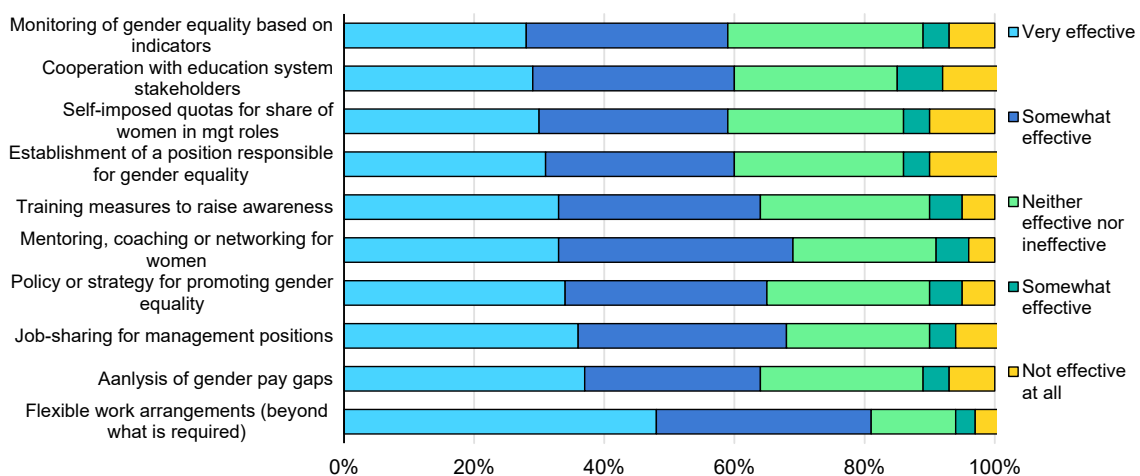
Early STEM career skill-building programmes and mentorships are important for supporting women's entrance into and advancement within the energy sector. To ensure that women benefit from skills development programmes, the barriers they may face in enrolling should be addressed. The Victoria government in Australia, for example, offers women subsidised apprenticeships, professional mentoring, and access to ongoing education in clean energy. This programme

responds to the lack of representation of women in the solar industry, as women account for less than 1% of solar designers and installers, as well as electricians, plumbers, air conditioning and refrigeration mechanics, and licensed electrical inspectors state-wide ([Solar Victoria](#), 2022). The programme is estimated to have contributed to the creation of over 5 500 clean energy jobs through targeted funding for new apprentices, information sessions, and upskilling opportunities for women already in energy-related sectors.

Policies within the European Union have promoted gender equality in the workplace. In 2021, the European Union adopted regulations for provisions to be applied to various initiatives including the Just Transition Fund ([EUR-Lex](#), 2024). These provisions contained gender-specific objectives for member states to promote equality, gender mainstreaming, and measures to increase women's labour market participation in the clean energy transition. Other initiatives, like the EU Gender Equality Strategy 2020-2025, emphasise the importance of gender balance in decision-making positions across all sectors, including energy ([European Commission](#), 2020). This strategy encourages member states to adopt measures that support gender parity, such as setting targets for women's representation in senior roles and fostering a work environment that is inclusive and supportive of women's career development.

A European Commission survey of employers on gender and employment in energy companies found that increasing the number of measures targeting gender inclusion is effective in bringing about improvements in gender balance ([European Union](#), 2024b). Flexible working arrangements are indicated as the most effective measure to improving gender equality, with approximately 80% of organisations indicating it to be somewhat or very effective. Other leading measures include job-sharing for management positions, and mentoring, coaching, or networking for women.

How effective is the measure in improving gender equality in your organisation, according to your experience?



IEA. CC BY 4.0.

Source: Karsten et. al (2024), "[Gender balance in the R&I field to improve the role of women in the energy transition.](#)"

The Equal by 30 campaign was launched in 2018, under the Equality in Energy Transitions Initiative, a joint initiative of the Clean Energy Ministerial (CEM) and the IEA to accelerate gender equality and diversity in clean energy transitions ([Equal by 30](#), 2024). The campaign represents a global commitment by public and private sector stakeholders to work towards equal pay, leadership, and opportunities for women, and other marginalised groups, to address current disparities. It promotes concrete actions through its key principles, with governments and organisations committing to ambitious targets, including increasing the representation of women in senior management roles, addressing wage gaps, and advancing inclusive workplace policies and programmes. International coalitions like the Gender and Energy Compact have also helped to bolster action for gender equality and women’s empowerment in the energy sector ([Gender and Energy Compact](#), 2024). With over 91 members including governments, civil society, and private sector actors, signatories submit individual commitments to accelerate the achievement of the compact’s key outcomes, ensuring women’s active roles as leaders, employees, entrepreneurs, and consumers in a fair and inclusive energy transition.

Training programmes targeting skills development for marginalised groups including Indigenous Nations and Peoples, rural populations, formerly incarcerated people and young people entering the energy workforce, have proven to be effective in encouraging greater diversity and inclusion within the energy workforce. In the United States there are public and private sector initiatives to train formerly incarcerated individuals for jobs in the clean energy sector. BlocPower launched the Civilian Climate Corps in 2021, a paid programme to train low-income and formerly incarcerated people in New York in building electrification ([BlocPower](#), 2024). As of 2022, over 1 700 members have been trained.

In Canada, the Indigenous-led organisation Indigenous Clean Energy has trained over 100 Indigenous participants as part of a clean energy capacity-building programme ([Indigenous Clean Energy](#), 2024). Over six months, participants engage in skills development sessions including on entrepreneurship, project development, financing and community engagement and planning. They are also connected with a mentorship network to implement their own clean energy projects. Implementing such skills development initiatives for Indigenous Nations and Peoples is important for fostering economic empowerment and ensuring fair access to opportunities and benefits from the transition. Financial support, training opportunities and knowledge exchange platforms for Indigenous leadership and inclusion should be prioritised to address historic inequalities and barriers to entry in clean energy sectors.

In building a more diverse clean energy workforce, ensuring equitable access to job opportunities across all demographics is critical. In the United States clean

energy sector, racial minorities are under-represented in clean energy jobs compared to the national workforce average. The Justice40 initiative is an example of policy designed to enhance equity, with 40% of overall benefits from clean energy investments and training directed towards disadvantaged communities ([Office of Energy Justice and Equity](#), 2024). This includes resources directed towards racial and ethnic minorities, Indigenous Nations and Peoples, low-income households, and any other groups identified as a disadvantaged community.

Engaging youth is also critical to meet growing clean energy workforce demand. This includes developing a robust pipeline of talent equipped with the necessary skillsets for the transition and ensuring youth voices are included in policy design and implementation. Establishing targeted internship and apprenticeship opportunities can provide practical experience for young people and support them as they enter the workforce. Student Energy's Career Training programme is an example of an international initiative that supports young people pursuing a career in energy by developing technical and soft skills ([Student Energy](#), 2024). Through 6 months of hands-on training, students complete modules on energy systems, modelling, and project management, with a final deliverable to execute a practicum project for a partner organisation.

Informal workers currently account for around 60% of the global workforce, of which 93% of workers are in emerging and developing economies ([ILO](#), 2018). Targeted policies can help ensure informal workers also benefit from the clean energy transition. In Ghana, the Accra Metropolitan Assembly resilience strategy emphasises the importance of increasing safety nets and benefits for informal workers ([C40](#), 2023). With the informal sector comprising roughly 80% of Accra's economy, the strategy sets out mechanisms for financial support, skills development training, better working conditions, and access to social benefits. Representing informal workers' interests is also key. In India, the Self-Employed Women's Association (SEWA) is the largest trade union for women workers in the informal economy, representing the voice of 2.9 million women ([SEWA](#), 2024).

3. How to deliver universal access to affordable energy as part of clean energy transitions?

Key message: Many people still lack access to energy and the benefits that come with it. An even greater number do not have access to clean cooking technologies, disproportionately affecting women and children's health. Improving affordable energy access for all should be a core imperative in all clean energy transitions.

Today 760 million people do not have access to electricity ([IEA, 2024f](#)). In 2022, the combined impacts of the coronavirus (Covid-19) pandemic, the energy crisis, and regional shocks associated with climate change caused a rise for the first time in decades ([IEA, 2024g](#)). This increase was concentrated in sub-Saharan Africa, where almost 85% of people globally without electricity access live and 2.3 billion people do not have access to clean cooking ([IEA, 2023d](#)).

The 2024 IEA Clean Cooking in Africa Summit was a historic mobilisation of government and private sector efforts, leading to pledges totalling EUR 2.2 billion ([IEA, 2024h](#)). Recognising the importance of this issue, governments have undertaken various policy approaches to prioritise clean cooking in national energy policies. These approaches often involve comprehensive frameworks that integrate clean cooking solutions into broader energy and environmental strategies, recognising the critical role of clean cooking in improving public health and fostering economic growth. For instance, Kenya established a National Cooking Transition Strategy in 2024 as a data-driven effort to achieve universal access to clean cooking by 2028 ([Ministry of Energy and Petroleum, 2024](#)). It outlines clear goals and actionable steps such as subsidising clean cooking technologies and providing financial incentives to domestic manufacturers of clean cooking equipment, while also focusing on implementing public awareness campaigns to educate communities on the benefits of clean cooking technologies.

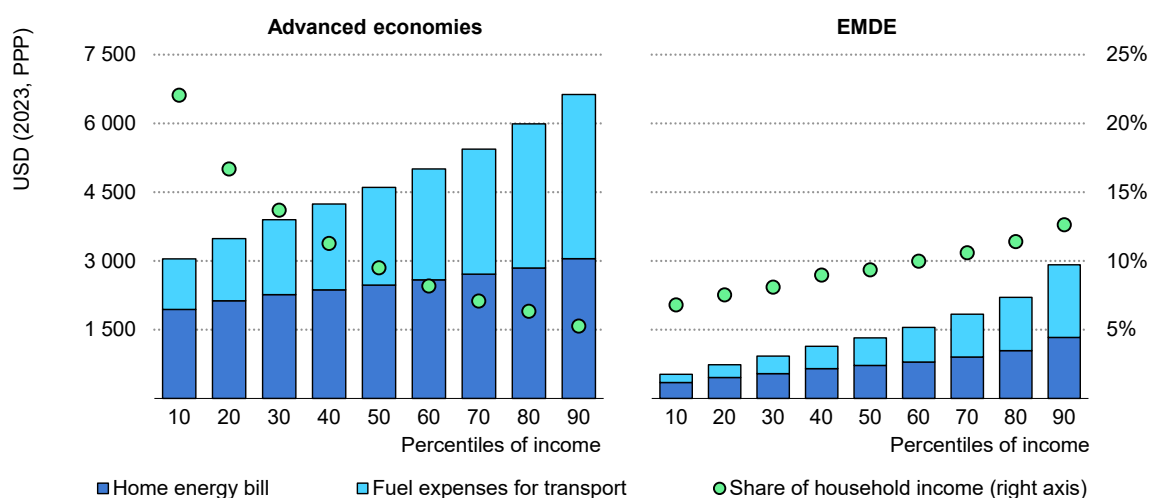
To ensure that investments in clean cooking benefit those most in need, they can be channelled into targeted programmes that improve both the access and affordability of clean cooking technologies locally. The Kopernik Wonder Women programme in Eastern Indonesia is one such example ([IEA, 2023e](#)). The programme trains women as micro-entrepreneurs to sell affordable clean technologies to their communities, which fosters clean technology deployment, women's empowerment, and job creation simultaneously. The WEYE Clean Energy Company, a youth-led initiative to support East Africa's transition from wood fuel to clean cooking technologies, produces and distributes stoves with the

goal of providing energy to 85% of Ugandans ([WEYE Green Group, 2024](#)). The initiative has engaged over 200 people and now supports 12 full-time and 4 part-time staff, while also holding training workshops for women and youth.

Understanding the barriers to improving energy access requires identifying context-specific challenges. iShack, a social enterprise based in South Africa, is an example of a programme using a localised approach ([iShack, 2024](#)). In order to provide immediate and affordable energy access to low-income informal settlements waiting to be connected to the grid, iShack uses community-based decentralised renewable energy to provide households with fully subsidised solar energy. In another example, to foster greater support for publicly-funded solar projects, the Solar Nigeria Programme targeted visible major public infrastructure including over 175 schools and 11 hospitals making solar a key component of government policy to increase energy access ([UK Foreign, Commonwealth Development Office, 2022](#)).

Energy access improves lives across a wide range of areas, including improved health, nutrition, and education, as well as job creation and workforce development. The cost and reliability of energy, in addition to physical access, can be a principal barrier for households in securing adequate energy. In advanced economies, the poorest 20% of households spend over 10% of their income on their residential energy needs, which is widely viewed as living in energy poverty ([IEA, 2024b](#)). Meanwhile, these households consume about half as much energy as the richest 10%. In EMDEs, lower energy spending among poor households is partly explained by lack of access to technologies that drives energy demand and reliance on traditional biomass for cooking. As energy access expands and energy consumption increases, improving the affordability of energy systems will be key, especially for lower-income households in EMDEs.

Household energy expenditure by income grouping, average 2019-2023



IEA. CC BY 4.0.

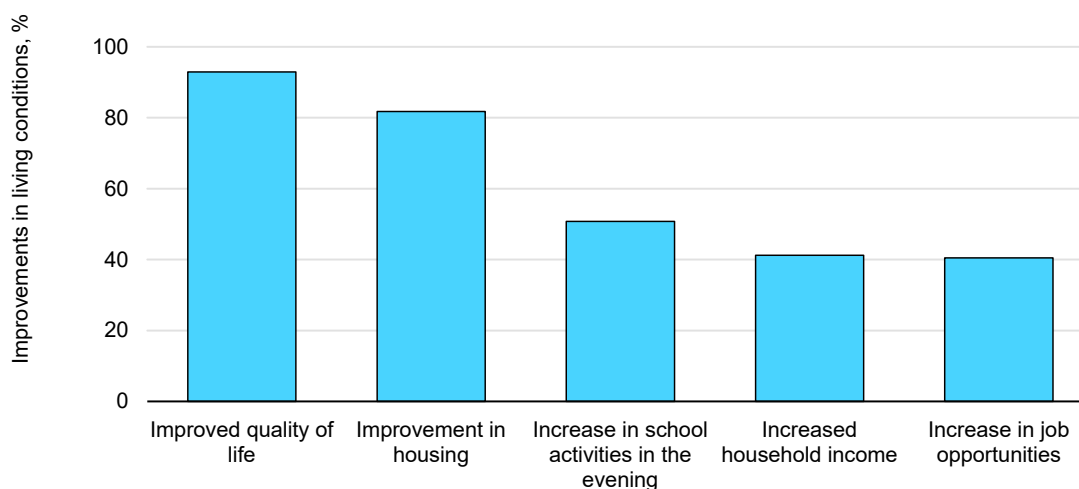
Source: IEA (2024b), [Strategies for Affordable and Fair Transitions](#).

Policy makers face a number of challenges in bridging the gap in energy access, and carefully designing and targeting policies is particularly important. Especially with more difficult to reach populations, decentralised renewable energy can be an effective policy solution. In Morocco, renewable energy deployment has helped increase rural populations' energy access from 18% to nearly 100% in the last three decades (IEA, 2023f). By enabling local stakeholders to take part in the design and implementation of projects and unlocking a variety of financing solutions, the country's electrification strategy has contributed to narrowing regional inequalities. Around the world, while over half of connections between 2022 and 2030 are projected to be made from the grid, 44% of new connections will be made from stand-alone photovoltaics and 3% from mini-grids (IEA, 2024g).

In Brazil, the Light for All programme, started in 2003, focused on providing electricity services to rural populations and communities of the Legal Amazon, including Indigenous territories and traditional peoples (IEA, 2017). The programme has prioritised lower-income families, Indigenous communities, as well as school and health facilities, collective spaces, and public services. The programme has provided both grid extensions and off-grid systems, demonstrating the importance of both expanding electricity networks and developing innovative technologies. Over time, these efforts contributed to a historic outcome as 17.5 million people have gained electricity access.

The success of Light for All was based on the programme's strong focus on combatting energy poverty as a vehicle for social inclusion and on narrowing social and regional inequalities (The Brazil Ministry of Mines and Energy, 2024). For example, the programme trained local labour to provide public electricity distribution services. To date, the programme is estimated to have increased job opportunities by 40%, household income by 41%, and school activities in the evening by 50%. The programme also positively impacted specific groups, such as enabling 309 000 women to start or resume their studies. Quality of life also visibly improved as the purchase of refrigerators, a key appliance to secure safe food consumption and conservation, has increased by 78%.

Impact of Light for All Programme in Brazil on opportunities of work, study, health and income



IEA. CC BY 4.0.

Source: The Brazil Ministry of Mines and Energy (2024), “Luz Para Todos: Social Policies and Universal Access to Electricity Department”.

Increasingly, energy communities have become a key tool to connect more people with affordable energy, especially in rural and remote areas. In Portugal, the “100 villages” project aims to reduce energy poverty and connect 25 000 households across 100 Portuguese villages in rural areas through community renewable energy ([Solar Power Europe](#), 2023). In the first village where the project was implemented, a total EUR 31 500 was saved on energy bills over the first year. By granting communities access to clean, reliable and more efficient energy at a lower price than electricity from the grid, the energy cooperative approach is bringing benefits to local residents, including reinforcing trust and creating ownership through active engagement of communities in energy consumption and production.

In Brazil, the RevoluSolar initiative was the first solar community to be founded in a favela, with a combined aim of reducing poverty and promoting solar energy as a more affordable solution that could empower communities ([RevoluSolar](#), 2024). By providing training, children’s education and involving the local community at all stages of the project, RevoluSolar contributed to reducing local unemployment rates, improving overall welfare and protecting the community from price shocks. To build the capacity of younger generations, RevoluSolar also provided workshops to over 400 children and teenagers and more technical courses at very low cost for the favela community.

Targeted energy access policies are key to improving living conditions for communities impacted by conflict and displacement. Although reliable data is

challenging to gather, it is estimated that roughly 90% of refugees and internally displaced people (IDP) living in settlements have little or no access to reliable and clean electricity or cooking fuels ([UN Environment Programme](#), 2017). In Iraq, a multi-stakeholder project financed the installation of a PV system, a lithium-ion battery storage, and a new distribution network to create a “solar mini-grid” system that provides electricity for the Mam Rashaan IDP camp ([Atmosfair](#), 2024). This created a permanent source of energy for approximately 8 500 people living in the camp, while also powering two schools, a hospital, a football field and a trauma centre. This project generated job opportunities for residents and provided educational opportunities to raise awareness on sustainability and energy-saving measures in camp households.

4. How can policies ensure low-income households and marginalised communities are able to afford clean energy technologies?

Key message: Policies that are specifically designed to increase broader participation in the clean energy economy, whether through targeting low-income households or focusing on technologies that are more widely used and accessible, will lead to more acceptance and uptake from all parts of society.

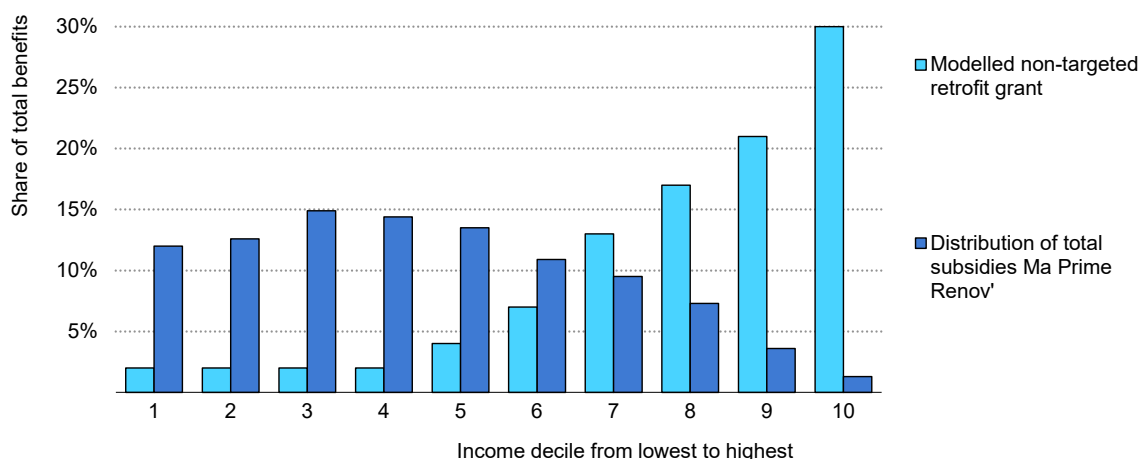
Countries have very different energy resources, existing energy infrastructure, investment landscapes, and available fiscal space, all of which significantly impact what kinds of interventions can be implemented. Likewise household income varies significantly and, without policy intervention, can determine who has access to clean energy technologies. Despite these varied circumstances, certain core strategies have proven effective in leading to more affordable outcomes. Key considerations include targeting specific policies to low-income populations and prioritising more vulnerable groups based on factors including age, gender and geographic location, selecting technologies that will be more broadly accessible to the population at large, and involving stakeholders in policy design.

Direct retrofit grants provide households with funding to cover some or all of the costs associated with implementing energy efficiency measures in buildings. The simplest grant covers a fixed percentage of the total costs for all applicants, with the rest covered by the applicant. In a non-targeted scheme, higher-income deciles tend to capture more of the incentive as they can more easily afford their share of the costs ([IEA, 2024b](#)). However, for lower-income families, the upfront investment required for a deep home retrofit can exceed a year's worth of income, potentially excluding them entirely. Several countries have adapted the design of retrofit grants to make them more accessible to low-income households.

In 2020, France introduced MaPrimeRénov', a consumer subsidy designed to cover a proportion of renovation costs based on multiple criteria, including

household income ([Ministere de l'Economie, des Finances et de l'Industrie, 2024](#)). The scheme was aimed at low-income groups and was intended to complement pre-existing retrofit grants, tax credits, and state loans.

Distribution of MaPrimeRénov' grant versus a modelled non-targeted retrofit grant



IEA. CC BY 4.0.

Note: Income deciles are based on available income at household level, including social benefits (INSEE definition).
Source: IEA (2024b), [Strategies for Affordable and Fair Transitions](#).

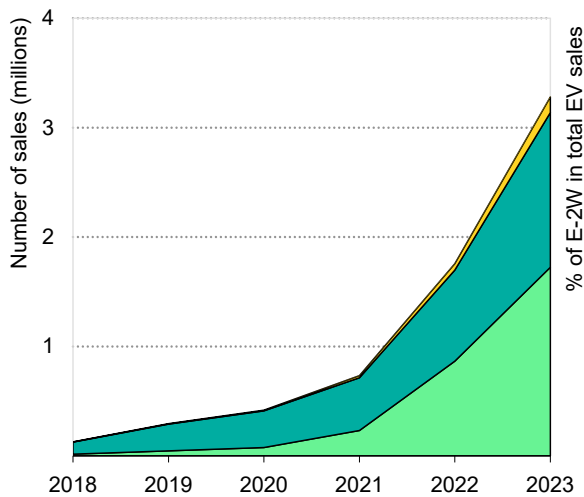
The scheme was revised in 2021 to ensure that applicants with the lowest incomes could receive up to 90% of their total renovation expenses, while those in the highest income category were limited to less than 40%. Between 2020 and 2022, the programme successfully prioritised low- and middle-income households, with nearly 70% of allocations going to those below the median income. Most applicants reported they would have not undertaken the renovations without the subsidy scheme. The impact of targeted retrofit grants is visible in other places. In Korea, for example, the government has supported nearly 660 000 vulnerable households and over 3 000 social welfare facilities since 2007 to improve the energy efficiency of their homes, including replacing heating and cooling system and improving insulation ([Korea Energy Foundation, 2024](#)). This has resulted in energy savings of almost 25% for low-income households and over USD 5 million annual energy bill savings.

In 2024, Canada announced the Canada Greener Homes Affordability Program ([Government of Canada, 2024a](#)). Launching in 2025-2026, this CAD 800 million programme aims to support Canadians with low to median incomes, including tenants, by reducing their monthly heating costs through energy efficiency and resiliency upgrades. Collaborating with provincial and territorial delivery partners, the programme will offer direct installation of home retrofits, managed by programme administrators at no cost to participants. This approach minimises

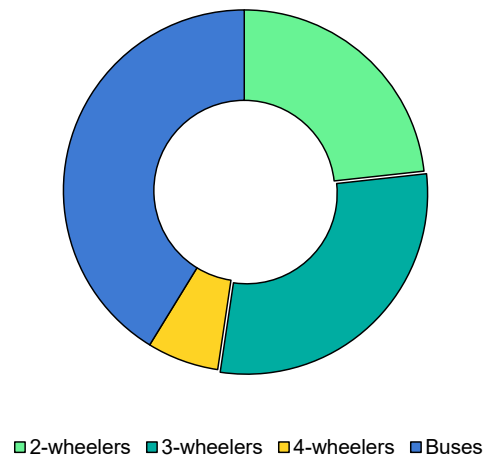
barriers for the target population, enhancing affordability while achieving greenhouse gas reductions and climate resilience².

Many consumers will not adopt clean energy technologies that require high upfront costs or technologies that aren't yet relevant or achievable for them. Focusing on technologies that are broadly accessible can help ensure the widest reach. For example, in emerging markets and developing economies (EMDEs), two- and three-wheel vehicles are often much more widely accessible modes of transport than cars. In India, the Faster Adoption and Manufacturing of Electric Vehicles (FAME) has provided financial support for the purchase of electric and hybrid vehicles ([Ministry of Heavy Industries, 2021](#)). This scheme also included a localisation rule which required the electric vehicles to be made in India, in turn stimulating domestic production of electric vehicles. While the scheme supported the purchase of electric three-wheelers, four-wheelers, and buses used for public and commercial transport, the only privately owned vehicles that were eligible for grant support were electric two-wheelers. FAME was designed to ensure that the most affordable vehicles received the majority of the allocated funding, and that a larger proportion of their purchase price was subsidised.

Sales of electric vehicles per category and share of electric 2-wheeler sales in total EV sales, India, 2018-2023



Share of funds allocated to EV categories, FAME II India, 2019-2024



IEA. CC BY 4.0

Source: IEA (2024b), [Strategies for Affordable and Fair Transitions](#)

² The programme features what can be referred to as a distinction-based component. A distinction-based approach means that the Province's work with First Nations, Métis, and Inuit people will be conducted in a manner that acknowledges the specific rights, interests, priorities and concerns of each, while respecting and acknowledging these distinct Peoples with unique cultures, histories, rights, laws, and governments ([British Colombia, 2024a](#); [British Colombia, 2024b](#)).

Sales data from electric vehicles in India show that the scheme has achieved its intended effect. In 2018, before the introduction of FAME II, a total of 129 000 electric vehicles were sold in India, with just 17 000 (13%) being electric two-wheelers. By 2023, total electric vehicle sales in India had increased to over 1.5 million, with more than half of these being electric two-wheelers.

Investments in public transport are another way policy makers can ensure benefits reach broader populations. In Germany, the government funded a special fixed-price ticket over the summer of 2022, making local public transport, including local and regional trains, affordable and widely accessible across the country. This exceptional measure was subsidised with EUR 2.5 billion by the Federal Government to improve affordability in the face of rising living costs caused by the global energy crisis ([The Federal Government](#), 2024). The ticket, priced at EUR 9, allowed anyone to travel within Germany using energy-efficient local public transport, which became more price-competitive compared to individual modes of transport. Although the measure was temporary, its significant uptake by lower-income groups demonstrates the extensive reach of public transport policies ([Rozynek](#), 2024). This ticket was followed in May 2023 by the “Deutschlandticket” at EUR 49 per month, subsidised with EUR 3 billion per year by the Federal Government.

While affordability is a priority across all countries, it will be a key issue in producer economies where fossil fuels represent a large part of government revenue. Policies will have to ensure that households can access affordable energy as clean energy transitions progress. In Iraq, the government has deployed various tools to incentivise solar uptake, in line with its objective to generate a third of its energy from renewable resources by 2030 ([The Arab Gulf States Institute in Washington](#), 2023). For example, it has introduced a scheme compensating households for surplus electricity generated, which has widened access to clean, affordable and reliable energy access for rural populations ([Hassan et. al.](#), 2024). In addition, it has allocated USD 750 million to provide near zero-interest loans for households and businesses adopting solar so that they can access cheaper and more reliable energy in the long-term ([Merd](#), 2023).

Innovative financing tools can play a key role in accelerating the adoption of renewable energy in producer countries and developing clean energy industries locally. In Kazakhstan’s Turkestan region, green bonds have been used to finance local small and medium enterprises implementing small-scale renewable energy projects on preferential terms ([UNDP Kazakhstan](#), 2022). These projects are progressively creating jobs and powering essential infrastructure including schools, greenhouses, factories and manufactories. This provides cheaper electricity for consumers and contributes to the socio-economic development of the region.

For industry, sustainable finance tools are critical to support clean energy transitions and achieve global climate goals. Policies like the EU Taxonomy Regulation provide a classification system for companies to identify, report, and invest in environmentally sustainable activities to ensure their operations contribute effectively to these objectives ([European Commission](#), 2024). Corporate and public green bonds initiatives also play a role in this effort by financing investments in projects that meet specific environmental and social criteria, driving sustainable energy solutions.

5. How to ensure clean energy policies maximise socio-economic benefits?

Key message: Clean energy policies can create broader socio-economic benefits beyond the energy sector, including better health or new sources of income for households. When policies are designed with this in mind, they can also contribute to addressing existing inequalities.

Clean energy policies can provide a wide array of benefits including expanding access to basic energy services that power light, heating and cooling devices or internet, better health through improved air quality, lower energy prices and job creation and can also help address impacts of climate change. In small island developing states like the Maldives which rely heavily on the import of diesel and other fossil fuels to meet their energy needs, the deployment of renewable energy can help build resilience to external shocks while lowering utility bills for consumers, powering essential infrastructure such as hospitals and schools, and creating jobs ([Raiser et. al](#), 2023). Clean energy can also help address water scarcity. In Iraq, for example, solar-powered pumping stations are helping isolated communities without reliable or affordable access to the grid to secure water at a cost up to 70% lower than if powered by diesel ([Welthungerhilfe](#), 2022).

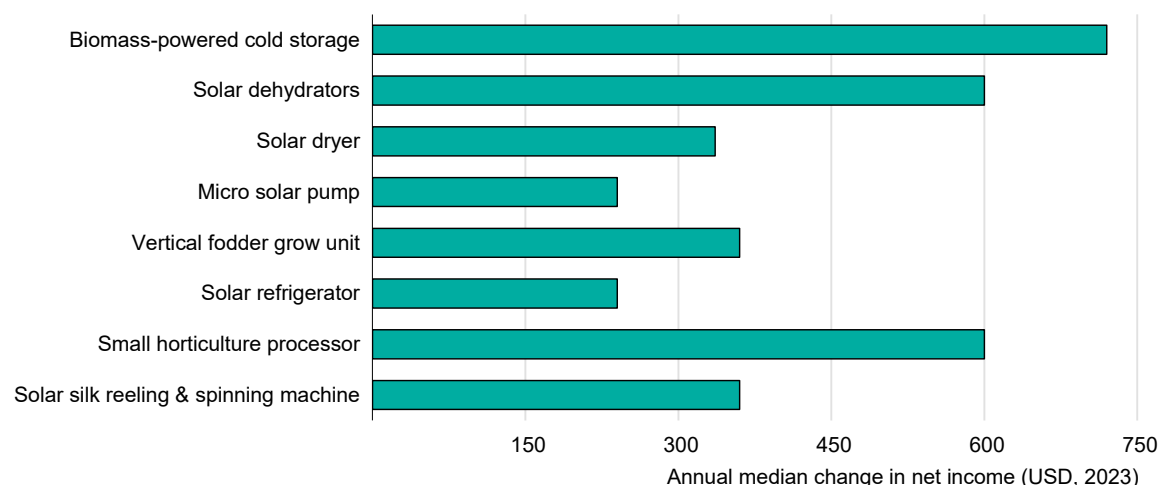
Designing policies to benefit specific segments of the population can enhance the impact of energy policy and align it with broader socio-economic goals. For example, in Greece where 70% of 18 to 34-year-old adults live in their parental homes, the Save and Renovate programme offers low to zero interest rate loans to encourage homeownership and incentivise energy efficiency renovations, reducing bills for young people ([Hellenic Republic Government](#), 2024). The Colombian programme, La Rolita, aims to improve both electric transport mobility and gender equality by deploying all-electric public buses and hiring women for 60% of the driving positions, in a sector where women globally hold only 20% of jobs ([UN Environment Programme](#), 2024).

The Solar Ear is a social business that manufactures affordable solar-powered rechargeable hearing aids in over 40 countries including Brazil, Botswana and the People's Republic of China ([Solar Ear](#), 2024). The company also contributes to empowering people with hearing impairments by employing and delivering

technical training to deaf people who make the devices, as well as education and awareness training spanning from sexual health to administrative processes like opening a bank account.

Targeted programmes like Powering Livelihoods in India, show that fostering local economic development can lead to increased productivity and employment, higher incomes or savings, and improved gender and other welfare outcomes ([Powering Livelihoods](#), 2024). This programme focuses on promoting the commercial scaling-up of affordable clean energy through capacity-building support for local enterprises. It has enabled the deployment of around 13 000 clean technologies by nearly 20 000 people in rural communities. Over three years, the programme has more than doubled the annual revenue of the participating enterprises and attracted approximately USD 7 million in follow-on capital from investors.

Median increase in net annual income for users of decentralised renewable energy measured through the Powering Livelihoods programme in India, June 2020-December 2022



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Note: Net income increase is dependent on productivity (output), additional revenue streams, savings on fuel/electricity, input costs and loan repayment. This case study was developed with the inputs of CEEW (2023).

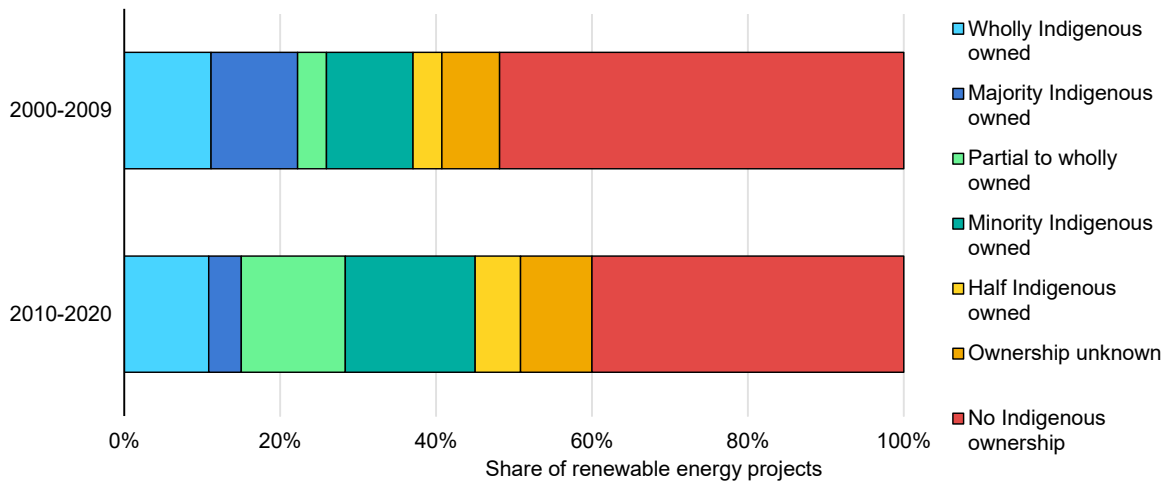
Source: IEA (2024b), [Strategies for Affordable and Fair Transitions](#).

Data on the socio-economic impact for end users show that the usage of clean energy technologies also led to positive social impacts, such as higher self-confidence and skills development.

Designing energy policies in alignment with broader socio-economic outcomes can help create structural change and address inequalities present in today’s energy systems. This is especially true for communities that have historically been at the margins of energy systems. In recent years, some provincial and territorial governments in Canada have prioritised renewable energy procurement with Indigenous participation in response to the history of large-

scale energy development on Indigenous land. In 2022, First Nations, Métis, and Inuit entities were partners or beneficiaries in nearly 20% of Canada’s existing electricity-generating infrastructure, most of which produces renewable energy ([Canada Energy Regulator, 2023](#)). Between 2009 and 2020, the number of clean energy projects on traditional Indigenous territory or reserve lands at least quadrupled, while Indigenous ownership of these projects increased from 41% to 51%. Indigenous participation in renewable energy development and ownership not only provides cleaner, more affordable, and reliable energy but also offers agency, revenue, and new job opportunities for Indigenous Nations and Peoples.

Renewable energy projects by share of Indigenous ownership in Canada



IEA. CC BY 4.0.

Source: [Canada Energy Regulator](#) (2024), “Market Snapshot: Indigenous Ownership of Canadian Renewable Energy Projects is Growing.”

In addition to extending the benefits of clean energy technology deployment to historically marginalised communities, policy designs that expand ownership and considers Indigenous Nations and Peoples as equity partners help redress existing dynamics and build the capacity of all actors to become agents and beneficiaries of clean energy transitions. For example, Canada has developed the National Benefits Sharing Framework and launched the Indigenous Loan Guarantee programme to increase opportunities for Indigenous equity ownership in clean energy projects by addressing the lack of access to affordable capital ([Canada Development Investment Corporation, 2024](#)). In addition, the Canadian Clean Energy for Rural and Remote Communities programme aims to reduce diesel use for heat and power by funding clean energy projects, prioritising Indigenous-led and Indigenous-driven solutions ([Government of Canada, 2024b](#)). With over 180 projects implemented to date, these initiatives have multiple co-benefits including clean energy job creation, revenue generation, and capacity building for Indigenous expertise and leadership in renewable energy technologies.

6. How can policy design determine the fair distribution of benefits and costs?

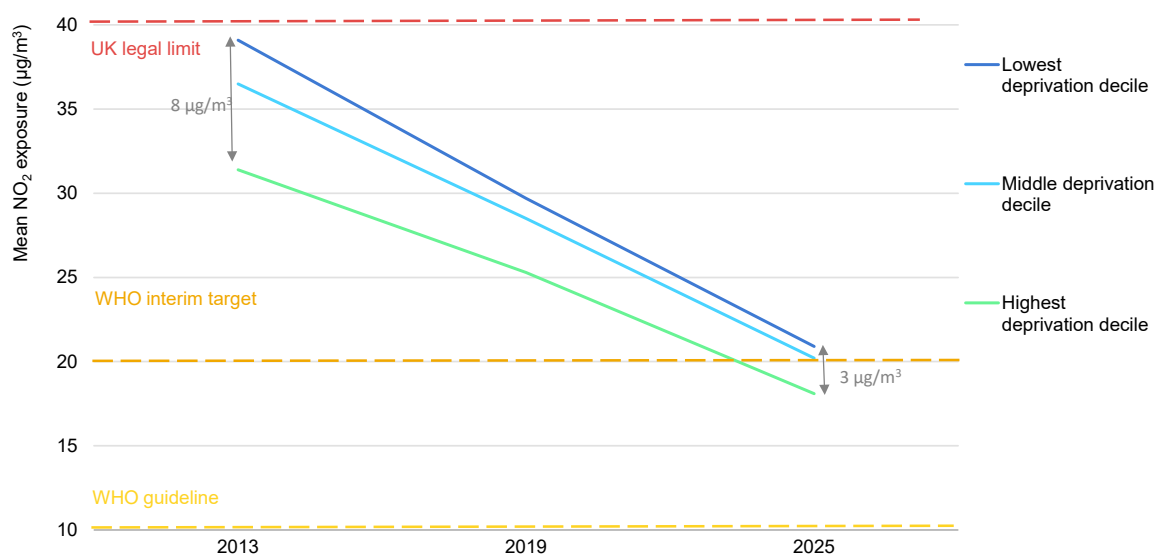
Key message: Identifying and monitoring the impact of policies on different groups is essential to adjusting policy design and creating complementary policies that ensure benefits are fairly distributed.

Policies that promote clean energy technologies need to be designed recognising that different groups across societies experience the costs and benefits of policies differently. In São Paulo, for example, a long-standing licence rotation law seeks to address traffic congestion by mandating alternate-day travel for vehicles based on numbered plates ([Cidade de Sao Paulo](#), 2024). EVs were recently exempted from this policy, allowing owners to drive every day. While intended to encourage uptake of electric vehicles, the policy naturally favours those who can afford EVs, and may also cause further congestion by having more cars on the roads. Thus, there is a risk that the costs of the policy are felt by everyone, but only certain segments of the population experience the benefits.

Implementation of low emission zones can provide interesting case studies on distributional effects ([Aether](#), 2023). Data show that households in lower-income areas can be disproportionately negatively impacted by air pollution. Car ownership is also unevenly distributed, with households in high-pollution areas less likely to own cars than those in less polluted areas.

Low emission zones and complementary transport policies can reduce air pollution and social disparities if designed with local factors in mind. In London, analysis of air pollution exposure over time indicates reductions in disparity between the highest and lowest income groups', with lower-income deciles experiencing more health benefits.

Air pollution exposure of London households by deprivation decile



IEA. CC BY 4.0.

Source: IEA Analysis based on data from [Aether](#) (2023).

However, low emission zones may risk generating disproportionate costs, especially when they impose fees on non-compliant commuters. These costs may particularly impact those lower-income households who rely on cars, rather than public transportation, as they are more likely to own older, more polluting vehicles. To address affordability concerns, policy makers in London have introduced car scrappage schemes that give money back for old vehicles. However, for lower-income groups, replacing a vehicle requires a greater budget proportion than for higher income groups. While low emission zones can be very effective in reducing air pollution, carefully tailored design is necessary to address distributional effects, such as the additional supports provided in the case of London.

Across clean energy policy design and implementation, monitoring distributional effects of clean energy policies and crafting complimentary policies, when necessary, can help to ensure fairer outcomes and ultimately more support for transitions.

The private sector, in collaboration with government, has a role to play in ensuring that benefits of clean energy project development accrue to local communities and foster social acceptance. In Spain, the government is using competitive tendering processes to award grid access capacity to renewable energy projects that maximise socioeconomic benefits locally in the Andorra region including through job creation, skills development or self-consumption ([Agencia Estatal Boletín Oficial del Estado](#), 2021). The selected project is set to bring more jobs than the coal power plant did in the same area.

Carbon taxation can be an effective tool to reduce carbon emissions by imposing a tax on the quantity of greenhouse gases emitted by a producer or on emission-intensive goods, including natural gas, coal and oil products and related services ([IEA, 2024b](#)). Due to the direct impact on price, carbon taxes have strong distributional implications and the way they are designed greatly determines whether they lead to fairer outcomes and for whom. When carbon taxes are imposed on goods that directly pass the cost of emissions onto consumers, the price increase can disproportionately burden lower-income households. This is especially true when carbon taxes target commonly used goods and services such as gasoline or when taxes lead to higher electricity bills for certain households.

One way to mitigate against these impacts on households is to invest revenue from carbon taxes to relieve fiscal burdens in other ways. In South Africa, carbon revenues were geared toward reducing or stabilising existing taxes and funding tax incentives, including to increase energy efficiency, electricity programmes and public transport improvements ([Institute for Climate Economics, 2024](#)). Governments can also choose to earmark the revenue they derive from carbon taxes to fund targeted programmes supporting lower-income households. For example, Ireland has allocated nearly 50% of its 2024 revenues from carbon taxes to fund energy efficiency retrofits and upgrades ([Government of Ireland, 2024](#)).

Over last 15 years, revenue from carbon taxes has more than tripled ([IEA, 2024b](#)). In 2022, over 40% of those revenues were earmarked for specific uses or allocated through direct transfers while the majority contributed to reinforcing the general budget, with a smaller portion (5%) resulting in tax cuts. There is significant potential for carbon revenue to provide further targeted support for the lowest income deciles in the coming decade. By 2035, the IEA estimates that total revenue from carbon pricing mechanisms will grow fivefold from today, generating USD 220 billion if carbon taxes are combined with emission-trading-systems (ETS). ETS, which cap emissions for producers and allow them to trade emission allowances, accounted for around 70% of carbon pricing revenue in 2022. Assuming income distribution in advanced economies remains unchanged through 2035, carbon revenues from the transport and buildings sectors could cover nearly all of the household clean energy investments required by the two lowest income deciles.

Carbon taxes and ETS hold significant potential in terms of financing mechanisms, but any given context will require extensive stakeholder consultations. While revenue recycling can help mitigate financial burdens, policies that generate revenue but allow polluting industries to continue operating in communities may perpetuate existing inequities. To realise the full potential of

carbon taxation in delivering fair transitions, robust stakeholder processes that fully address the needs of affected communities are essential.

Clean energy investment today remains concentrated in the world's largest economies. While this is not the focus of this paper, climate finance plays a very important role in achieving clean energy transition. In particular, multilateral development banks and international agreements such as the Just Energy Transition Partnerships (JETPs), which support specific countries in transitioning out of coal, are key to redirecting finance flows from countries with more resources toward those with fewer resources, which are often most vulnerable to the impacts of climate change ([International Institute for Sustainable Development](#), 2022). To meet the Paris Agreement goals, the IEA estimates that annual clean energy investments from public and private sector in EMDEs needs to more than triple from USD 770 billion in 2022 to USD 2.2-2.8 trillion per year by the early 2030s and remain around these levels until 2050 ([IEA & IFC](#), 2023). The new NDC cycle offers the chance to set ambitious climate and energy targets until 2035 with strong signals for potential investors to support a just and sustainable energy transition.

Identifying communities that have historically borne the largest environmental and health costs from industrial activity is key to ensuring they receive adequate and targeted support. This includes Indigenous Nations and Peoples whose land and water has been taken for economic development, workers and residents in communities near polluting sites who have suffered disproportionate health burdens, and low-income and marginalised communities, including some racial minorities, who have historically been victims of toxic waste dumping and are often disproportionately impacted by pollution. Policymaking that actively recognises these imbalances and designs for the fair distribution of benefits and costs is key to preventing further harm and achieving successful transitions. The design of policies and projects, from initial planning to decommissioning, can significantly influence outcomes for these populations, who often reside in economically disadvantaged areas.

7. How to put meaningful participation of all stakeholders at the heart of clean energy transitions?

Key message: The active participation of all stakeholders in clean energy policy design is key to the long-term acceptability of transitions and their effective implementation.

When a wide range of constituencies with different viewpoints – for example local and marginalised communities, industry and labour representatives, Indigenous Nations and Peoples, youth and consumers – are actively engaged, represented and supported with options for partnership and ownership on clean energy projects, policies are more likely to have public support and create solutions that are equitable, inclusive, and supported locally. The process of policy design can provide meaningful opportunities for wide participation through distinct social dialogue processes including collective bargaining or stakeholder consultations. Continuous social dialogue and effective consultation processes ensure stakeholders are given genuine opportunities to influence policy outcomes, take leadership positions in clean energy projects, and to participate in designing plans they will be affected by. Various avenues are available for governments and the private sector to meaningfully engage with stakeholders, as established in the longstanding Aarhus Convention, which grants the public the right to access information, participate in decision-making and challenge public decisions that have an environmental impact ([UNECE](#), 2024).

Consultation processes require transparency and accessibility to be effective and for their outcomes to be perceived as fair. Consultations should remove barriers to participation and entail clear communication of objectives, timelines, and how the consultation's results will be used. Most importantly, effective consultations should not occur as a one-off event but as an ongoing process throughout the policy design, implementation, and monitoring phases. Feedback mechanisms should be adaptable and should keep continued engagement with stakeholders to maintain trust while ensuring policy outcomes remain relevant and effective over time and allow for continued improvement of policies. In Scotland, for example, community benefit frameworks from onshore renewable energy developments include a cyclical feedback process in which local

communities are given an opportunity to express their needs and concerns, leading to policy adjustments that better meet local priorities ([The Scottish Government](#), 2019).

By engaging with key stakeholders, including trades unions, communities and industry representatives, governments can develop comprehensive transition agreements that assess socio-economic impacts in affected territories and offer skills development programmes, social protection, and support to local industries. In countries that have taken this approach, these collaborative efforts have led to more effective transitions. In Spain, for example, new major industrial projects have mobilised more than EUR 7 billion in affected areas, resulting in fewer socio-economic disruptions and higher levels of public support for the shift to a clean energy system ([Instituto Para La Transición Justa](#), 2023). In Poland, the Council of Social Dialogue plays an important role in helping to ensure a fair and affordable energy transformation, that provides effective support for low-income and most affected groups ([Service of the Republic of Poland](#), 2024a). Similar bodies have facilitated the conclusion of social agreements between the government and trade unions to phase-out hard coal by 2049 and provide social protection measures for workers including early leave where workers may receive 80% of their salary, employment guarantees in other operating mines and a one-time retraining opportunity ([IEA](#), 2023g).

Canada has established an engagement framework to ensure that all Canadians can contribute to the government's work to support sustainable job creation in the move to a low-carbon economy. This includes the establishment of the Sustainable Jobs Partnership Council, comprising members from labour, industry, Indigenous peoples, and other key stakeholders, which will provide independent advice on measures to support workers and communities ([Government of Canada](#), 2024c). The Sustainable Jobs Secretariat will conduct ongoing engagement and serve as a source of information on federal programs, funding, and services related to sustainable jobs.

Establishing citizens' assemblies and formal youth engagement processes help engage ordinary citizens and younger generations in decision making. Citizen's assemblies are designed to reflect the diverse perspectives of the population, ensuring that these viewpoints are considered in decision-making processes. These assemblies can build trust and support over time, leading to more robust and widely accepted policies by providing a platform for deliberation and consensus-building on key policy issues on clean energy transitions.

In 2017, the Citizens' Assembly of Ireland, for which 99 citizens were randomly selected to deliberate on climate action, resulted in a series of ambitious recommendations on the deployment of renewable energy and energy efficiency ([The Citizen's Assembly](#), 2024). The resulting recommendations were given

meaningful consideration by parliament and later adopted into policies by the government. This model of direct citizen engagement has been praised for its ability to generate informed, balanced, and publicly supported policy recommendations.

While skills training, capacity building, and tailored education programmes are key to ensuring youth participation in clean energy transitions, it is equally important to ensure processes are in place to formally input their perspective into decision-making on climate action. In Denmark, the Youth Climate Council is responsible for collecting insights from young people nationwide and formulating concrete policy recommendations to the Minister of Climate, Energy and Utilities ([IEA](#), 2023h). These recommendations are integrated into the policy-making process, providing young people with a direct channel to influence decision-making. Other processes can include informal youth advisory panels or online platforms and forums that can engage young people in dialogues on clean energy policies.

Fostering participatory models, such as community-based energy projects and awareness campaigns, empowers citizens to become active agents of their local clean energy transitions. Community ownership models, such as renewable energy cooperatives, have been shown to significantly enhance public acceptance of clean energy projects, to create new local economic opportunities, and to provide access to affordable energy. Colombia is pioneering the first regulation on energy communities in Latin America, which outlines the types of legal representation these associations can have, the objectives of energy communities, the activities they can perform, and their right to government financing ([Ramírez-Tovar et. al](#), 2023).

Cities are in a unique position to build trust with their communities and ensure they perceive the benefits of clean energy transitions. In Lisbon, plans to implement a Social Solar Tariff would transfer financial benefits of municipally-owned solar plants to low-income residents ([C40 Cities](#), 2024). This project aims to actively engage the most vulnerable households in the formation of energy communities, ensuring they experience economic and social benefits from the adoption of clean energy.

Engaging consumers as active participants of transitions is key to empower them and accelerate the support for deployment of clean energy technologies. In Poland, a programme aiming to improve households' heating standards provided partial financial support to consumers buying heat pumps with a certified level of efficiency ([Service of the Republic of Poland](#), 2024b ; [Małopolska in a healthy atmosphere](#), 2024). To ensure effective deployment, local authorities in the Małopolska region established a group of eco-advisers to help answer residents' questions including on green technologies, renewable energy systems, heating

standards or renovation choices ([Małopolska in a healthy atmosphere](#), 2024b). They also help residents to read and understand their energy bills and advise them on the tariffs or providers that could better serve their needs. This type of approach helps ensure that the clean energy technologies being rolled out are adapted to and understood by their users.

The private sector, particularly micro, small, and medium-sized enterprises (MSMEs), which represent 90% of businesses globally, is a key partner in developing and implementing effective clean energy transition policies ([ILO](#), 2019b). It is important for governments to establish clear and detailed long-term energy transition plans, which explicitly align industrial and climate policies. This alignment helps stimulate and de-risk private investment in clean energy sectors, supporting job creation and economic development. By partnering with businesses, governments can identify current gaps and challenges, ensuring that transition policies are evidence-based and informed by high-quality data. For example, in 2019, the Danish government increased business participation in transition planning by consulting with 14 business cluster groups, which provided 455 recommendations ([The Danish Government's Climate Partnerships](#), 2024). So far, 80% of these recommendations have been implemented, highlighting the potential for businesses to drive clean energy transitions through active engagement and collaboration.

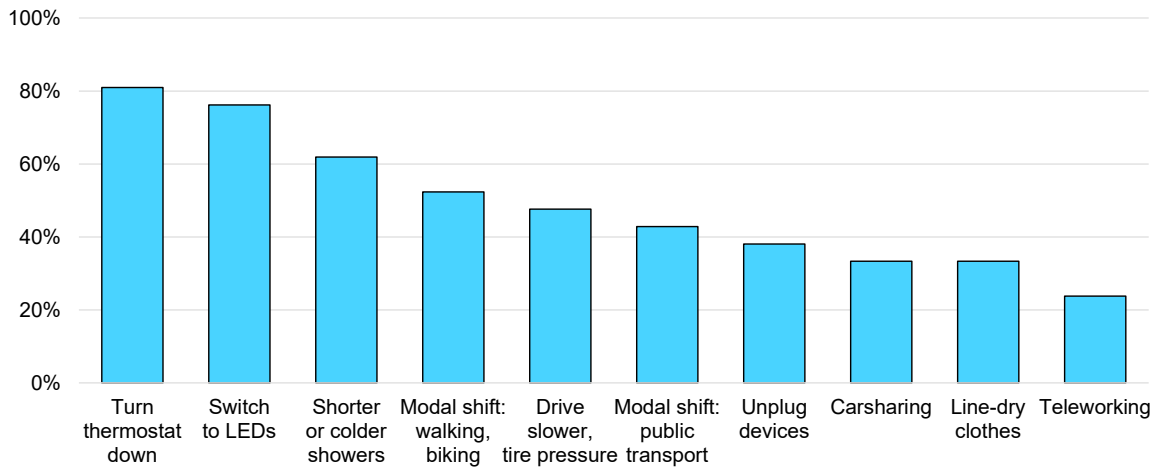
Ensuring that companies invest in communities where they develop renewable energy infrastructure is also crucial to gaining public acceptance. For instance, in the Spanish municipality of Higuera, local corporations involved with the country's third largest wind park have contributed to socio-economic development by investing in social centres, sports facilities and a nursery school ([Asociación Empresarial Eólica](#), 2022). This has not only fostered community support but also created job opportunities for young workers who choose to stay in the town. However, while there are best practices of effective social dialogue involving government, employers and workers, the World Benchmarking Alliance's Just Transition Assessment 2021 found that only 15 out of 180 major international companies across oil and gas, electric utilities, and automotive sectors effectively consulted with those most impacted in their transition plans ([World Benchmarking Alliance](#), 2021).

Awareness and behaviour campaigns can empower citizens through communication and education, enabling them to actively contribute to energy transitions and benefit from the process, fostering a sense of ownership. In 2022, the IEA collaborated with the European Commission on the 'Playing My Part' campaign, encouraging European citizens to reduce their reliance on energy from the Russian Federation, support Ukraine, and accelerate Europe's clean energy transition ([IEA](#), 2022a). Evidence from several awareness campaigns

indicates that informed and engaged communities are more likely to adopt energy-efficient practices and support clean energy policies (IEA, 2022b).

In Korea, several initiatives to promote carbon neutrality and behavioural change have seen uptake by younger generations, who are helping create video content and sharing it on social media to educate the public on adopting carbon neutral habits. An innovative carbon neutrality point system grants consumers cash or voucher incentives depending on how many electricity, water and gas savings they are able to make in houses and commercial buildings (Korea Environment Corporation, 2024). The programme has been highly successful, with over 2.2 million participants registered in December 2023.

Most frequently mentioned tips in energy-saving campaigns, 2022-2023



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Source: IEA (2023i), [Energy Efficiency](#).

Annexes

Annex 1 – Commission members

The Global Commission on People-Centred Clean Energy Transitions: Designing for Fairness is convened by the Executive Director of the IEA, Dr Fatih Birol. Members include:

- **Alexandre Silveira de Oliveira**, Minister of Mines and Energy, Brazil (Co-Chair)
- **Teresa Ribera**, Deputy Prime Minister and Minister of Ecological Transition and Demographic Challenge, Spain (Co-Chair)
- **Arifin Tasrif**, Minister for Energy & Mineral Resources, Indonesia
- **Ayisha Siddiqa**, Youth Climate Advisor to UN Secretary General
- **Chief Sharleen Gale**, Chair, First Nations Major Projects Coalition
- **Dan Jorgensen**, Minister for Climate, Energy and Utilities, Denmark
- **Diego Pardow Lorenzo**, Minister of Energy, Chile
- **Fareed Yasseen**, Special Climate Envoy of the Republic of Iraq
- **Gilbert F. Hounbo**, Director General, International Labour Organization (ILO)
- **Hadiza Abdulmumini**, Global Focal Point, SDG7 Youth Constituency
- **Helena Leurent**, Director General, Consumers International
- **Jean-Pierre Clamadiou**, Chairman of the Board of Directors, ENGIE
- **Jennifer Morgan**, State Secretary and Special Envoy for International Climate Action, Germany
- **John W. H. Denton AO**, Secretary General, International Chamber of Commerce
- **Jonathan Wilkinson**, Minister of Natural Resources, Canada
- **Laurence Tubiana**, Chief Executive Officer, European Climate Foundation
- **Luc Triangle**, General Secretary, International Trade Union Confederation
- **Maria da Graça Carvalho**, Minister for Environment and Energy, Portugal
- **Nkeiruka Onyejeocha**, Minister of Labour and Employment, Nigeria
- **Omar Andrés Camacho**, Minister of Mines and Energy, Colombia
- **Paulina Hennig-Kloska**, Minister of Climate and Environment, Poland
- **Sang-hyup Kim**, Co-Chairperson, Presidential Commission on Carbon Neutrality and Green Growth, Korea
- **Selwin Hart**, Special Adviser to the Secretary-General on Climate Action and Just Transition, United Nations

- **Sheila Oparaocha**, Director, International Network on Gender and Sustainable Energy (ENERGIA)
- **Yvonne Aki-Sawyerr**, Mayor of Freetown; Co-Chair, C40 Cities
- **Zingiswa Losi**, President, Congress of South African Trade Unions (COSATU)
- **Zulfiya Suleimenova**, Special Representative of the President of Kazakhstan on International Environmental Cooperation, Kazakhstan

Annex 2 – Recommendations from the 2021 Global Commission on People-Centred Clean Energy Transitions

Decent Jobs and Worker Protection

1. Design transitions to maximise the creation of decent jobs.
2. Develop tailored government support for communities and workers as well as a focus on skills and training.
3. Use social dialogue, robust stakeholder engagement and policy co-ordination to deliver better outcomes.

Social and Economic Development

1. Ensure that policies enhance social and economic development and improve quality of life for all.
2. Prioritise universal clean energy access and the elimination of energy poverty.
3. Maintain and enhance energy security, affordability and resilience.

Equity, Social Inclusion and Fairness

1. Incorporate gender, equality and social inclusion considerations in all policies.
2. Ensure fair distribution of clean energy benefits and avoid the risk of disproportionate negative impacts on vulnerable populations.
3. Integrate the voices of younger generations in decision making.

People as Active Participants

1. Involve the public through participation and communication.
2. Use insights from behavioural science to design effective behaviour change policies Integrate the voices of younger generations in decision making.
3. Enhance impact through international collaboration and exchange of best practice.

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