



Energy Justice POINTs: Policies to create a more sustainable & fairer future for all

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Summary

The transition to clean energy is one of the UK's five priority areas for COP26. Alongside the potential benefits from creating green energy jobs, transition to a net-zero energy system offers the potential for delivering broader social, political, and economic benefits (Hamilton and Akbar, 2010; Hepburn et al., 2020; Roy et al., 2018; Sovacool et al., 2020).

History shows us that socio-economic disruptions associated with transitions tend to amplify inequalities (Sovacool and Brisbois, 2019). It is likely that without intervention, these benefits, and the costs to deliver them, will not be evenly distributed across society, with negative impacts disproportionately affecting those in lower socio-economic and minority groups.

Against this backdrop there has been increasing recognition for the need for Energy Justice – to deliver a socially inclusive and equitable net-zero transition (Abram et al., 2020).

This growing awareness of the importance of energy justice has created the need for a framework or lens through which policy impact can be explored at the wider system level to help mitigate against unintended consequences.

Energy Justice POINTs (Policy Overview and Impacts for Net-zero Transitions) – see Figure 1 – provides a useful and usable framework to help decision makers explore the wide-reaching energy justice implications of their net-zero visions, strategies, and policies.

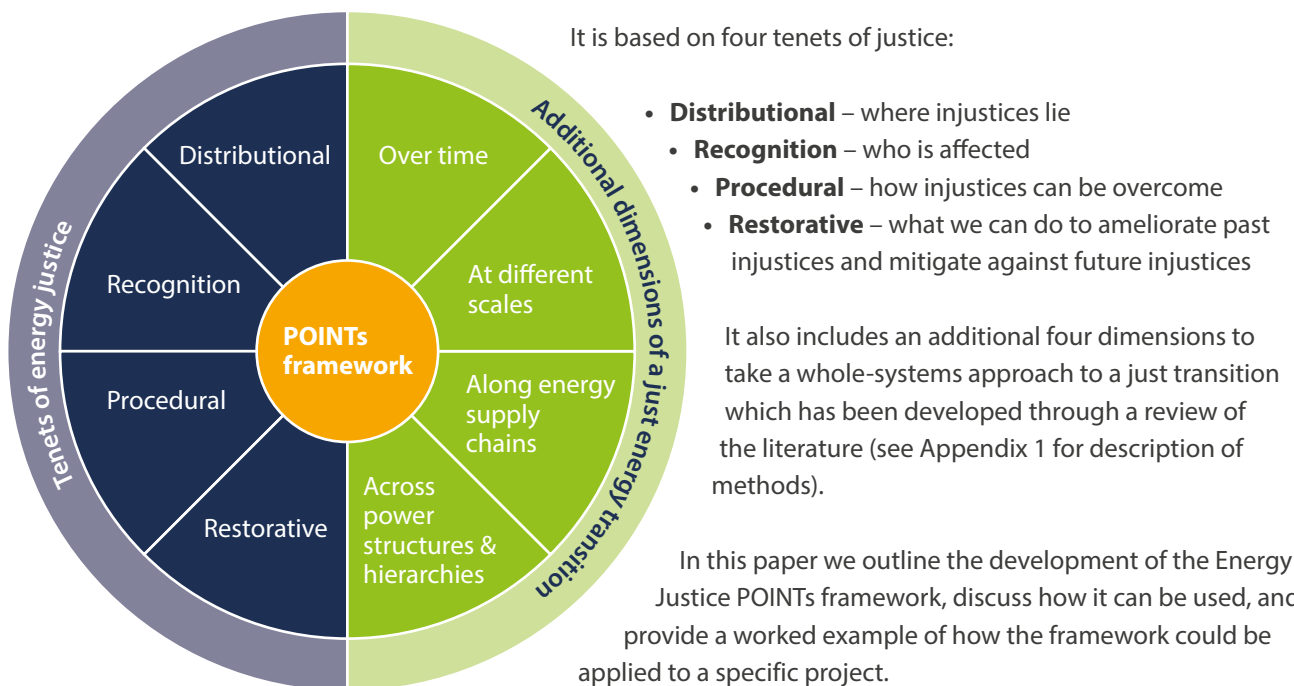


Figure 1: The Energy Justice POINTs framework

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Introduction

In the run up to COP26 countries around the world are revisiting their net-zero commitments and nationally determined contributions (NDCs) toward limiting the impacts of climate change. Recent weeks have seen revised commitments from Japan, South Korea and China, and the welcome return of the US to the Paris Agreement. Alongside this activity at the national level are commitments to deliver net-zero carbon emissions by 2050 from businesses, cities, regions and wider investors via the United Nations Framework Convention on Climate Change (UNFCCC) Race to Zero campaign, which now includes 454 cities, 23 regions, 1,397 businesses, 74 of the biggest investors, and 569 universities around the world.¹

The energy sector is a key area for action, and the transition to clean energy is one of the UK's five priority areas for COP26. This transition has the potential to impact a wide range of stakeholders across government, industry, business, communities, workers and members of the public, and across geographic scales and boundaries, industry sectors, and supply chains. Alongside the potential benefits from creating green energy jobs, transition to a net-zero energy system offers the potential for delivering broader social, political, and economic benefits (Hamilton and Akbar, 2010; Hepburn et al., 2020; Roy et al., 2018; Sovacool et al., 2020).

However, we are also faced with an era of unprecedented social and economic inequality (Lacey-Barnacle, 2020), and history shows us that socio-economic disruptions associated with transitions tend to amplify inequalities (Sovacool and Brisbois, 2019). It is likely that without intervention, these benefits, and the costs to deliver them, will not be evenly distributed across society, with negative impacts disproportionately affecting those in lower socio-economic and minority groups.

Against this backdrop there has been increasing recognition for the need to deliver a socially inclusive and equitable net-zero transition (Abram et al., 2020). There is a moral imperative to embed justice in the energy transition and underpin international agreements (see Box 1). Equally important, the transition to a net-zero future simply won't happen at the pace and scale commensurate with the commitments being made by national, sub-state, and non-state actors unless the values, needs, perspectives, and rights of the energy workforce and wider society are accounted for.

¹ Up-to-date statistics available from [UNFCCC](#).

Box 1: The international context of a just transition

Justice, and a Just Transition, are enshrined in international agreements. The 2030 Agenda for Sustainable Development (UN, 2015), adopted by all United Nations Member States in 2015, sets out 17 goals aimed at ending poverty, protecting the planet, and ensuring prosperity for all people in line with a just and equitable energy transition. In the same year the International Labor Organization (ILO, 2015) also set out 'Guidelines for a Just Transition' with clear indicators for international governments surrounding the 'greening of economies' in line with decent work, poverty eradication and environmental sustainability.

Three years later, during the COP24 meeting in 2018, the 'Just Transition' received particular emphasis, with the adoption of the "Solidarity and Just Transitions Silesia Declaration". A Just Transition takes into account the rights of the workforce, encourages the creation of decent work and quality jobs in sustainable economic sectors in accordance with nationally defined development priorities. It also sets out that the burden of climate action should not be borne unequally by one set of workers or communities or any one country, encapsulating a very geographical perspective on who is affected and where (Jenkins, 2019; Jenkins et al., 2020a).

Engaging workers in a shifting industry

Changes in energy production and use toward net-zero could lead to the loss of 6 million jobs globally by 2030, while creating 24 million new jobs, compared to a 'business as usual' pathway (Gambhir et al., 2018). However, it's not just the number of jobs that is important to consider, but other factors. These include job availability, duration, and hours, as well as the quality of these jobs, described, for example, by pay, career progression opportunities, whether workers are employed or self-employed, and the presence of unions to represent workers in growing industries.

Workers in high carbon sectors would be willing to move to jobs outside the sector, or in the renewables sector, according to research (Robins, 2020). However, perceived injustices, anxiety over losing out, and lack of clarity around how their needs can be met can lead to pushback or backlash against decarbonisation. This was evident in some of the areas of the US that voted for Donald Trump (Healy and Barry, 2017) and also in the 2019 Australian elections that saw voters in the coal-producing state of Queensland rally against proposals to cut coal production over fear for their jobs and income (Johnson, 2020). Workers backlash was also evident in the 'Mouvement des Gilets jaunes' turbulence on the streets of France due to President Macron's rise in fuel duty (Abdelal, 2020) and the historic 1980s Miners Strikes in the UK (Foden et al., 2014). Workers must therefore be engaged in the transition in order to build socio-political support for the changes required as the world shifts toward a net-zero economy.

It is also important to recognise that not all regions will see net job creation. The Middle East and Africa will experience job losses if their economic structure stays in line with historical trends (Gambhir et al., 2018). In these regions, and others with prevailing fossil-fuel based industries, the shift away from coal could lead to increasing levels of poverty and unemployment, along with the loss of embedded local identity (Harrahill and Douglas, 2019).

Additionally, job losses in areas dependent on fossil-based industries of coal, oil and gas can lead to further job losses in other sectors such as retail and construction due to the general decline in local and regional economic vitality (Graff et al., 2018). Without the right policies and public investments, these regions – including the east coast of Scotland and the north east of England in the UK – could suffer disproportionately (Nicolle et al., 2020).

While powering past coal is clearly a key dimension of delivering net-zero, closure of mines can have significant widespread and long-lasting negative impacts on these regions. A study by Sheffield Hallam University in 2014 (Foden et al., 2014) on former coal mining areas across England, Scotland and Wales showed continued substantial unemployment and deprivation. Key statistics highlighted that:

- Across the coalfields as a whole, there are just 50 jobs for every 100 residents of working age. In South Wales there are just 41 for every 100.
- Coalfield residents in work are more likely to be employed in lower-grade or manual occupations, and the coalfield workforce is more likely to lack higher-grade qualifications.
- Ill health is widespread: In most of the coalfields, the proportion of residents reporting ill health or limitations on everyday activities is almost double the level in South East England.
- Deprivation is widespread: 43% of all neighbourhoods in the coalfields fall into the worst 30% in Britain, according to Indices of Deprivation.

To address this and help mitigate impacts on people and communities, ‘just transition’ movements are springing up internationally. These include:

- The Just Transition Centre established by the International Trade Union Confederation (ITUC) in 2016
- The Scottish Just Transition Commission established in 2019
- The Institute for Just Transition introduced by the Spanish Government in 2020

These initiatives bring together workers and their unions, communities, businesses and governments. They focus on optimising opportunities for industrial and economic activity to provide employment and development for workers and regions affected by low-carbon transition and exploring the need for early planning and long-term investment to capture the economic benefits of transition.

However, it is not simply a matter of creating new jobs, as job creation in itself does not necessarily ensure just outcomes (Abram et al., 2020). Governments need to take account of where these jobs will be located, who will be filling them, and whether there is adequate skills provision training for workers to undertake them. This includes equal access to education and targeted vocational training for lower skilled workers to ensure that the creation of ‘green’ jobs benefits the workers and regions most in need (Unsworth et al., 2020).

Beyond workers: addressing wider societal issues

The magnitude of reducing energy sector carbon emissions requires action across the whole of society (Bolwig et al., 2020). This means that public acceptance and support is a critical element in delivering net-zero (Heffron and McCauley, 2017).

Governments and companies need public commitment as they make difficult decisions surrounding how much to spend, how much cost to pass on to consumers and what kinds of policies and regulations to implement (Bayulgen and Benegal, 2019). Furthermore, a lack of social acceptance can increase costs, cause delays and unwanted distributional impacts (Bolwig et al., 2020).

The social acceptance of transition can be characterised in three areas: socio-political acceptance, community acceptance, and market acceptance (Bolwig et al., 2020):-

Socio-political acceptance means that new energy technologies are considered to be acceptable and useful by society and they are favourably represented by media, politics and national institutions (Bolwig et al., 2020). A lack of socio-political acceptance can lead to social backlash as shown in the 'Gilets Jaunes' movement in France (Tagliapietra et al., 2019) and the demonstrations in Santiago, Chile sparked by an increase in metro fares caused by the decision to power the rail network with renewable energy (Early, 2019).

Community acceptance covers the opinions of people living in the environment of specific energy projects, who therefore bear most of the direct external impacts. Community perceptions may also be shaped by past experiences and cultural heritage (Cuppen et al., 2020). Processes which engage local citizens and build trust in these energy projects can contribute towards gaining community acceptance; a lack of such processes can contribute to local conflicts surrounding projects (Bolwig et al., 2020).

Market acceptance relates to consumer costs and a perceived fair distribution of financial benefits between producers and customers. A recent Welsh study (Becker et al., 2019) uncovered 'pervasive distrust' in the energy sector caused by a perceived lack of transparency in reporting company profits and perceived collusion between energy companies, government and the regulator leading to unfair profiteering by energy companies. This was echoed in a study in Cornwall (Bray and Woodman, 2020) which also uncovered public distrust in energy company profiteering.

It is worth noting that social acceptance or lack thereof often hinges on perception rather than fact, and may in fact constitute misperception. Individuals or companies may attempt to do the right things but if the public perception of the industry or technology is negative, or hinges on deeply rooted concerns related to trust and integrity, it becomes a challenge to make progress in the desired direction. In addition, the current transition to net-zero is happening against the backdrop of uneven distributional impacts of past transitions that have already undermined public trust. This is particularly true in the UK where social inequality and regional disparities have worsened since the Austerity agenda, introduced in 2010, drastically cut public expenditure for services such as education, health and welfare provision (Lacey-Barnacle, 2020).

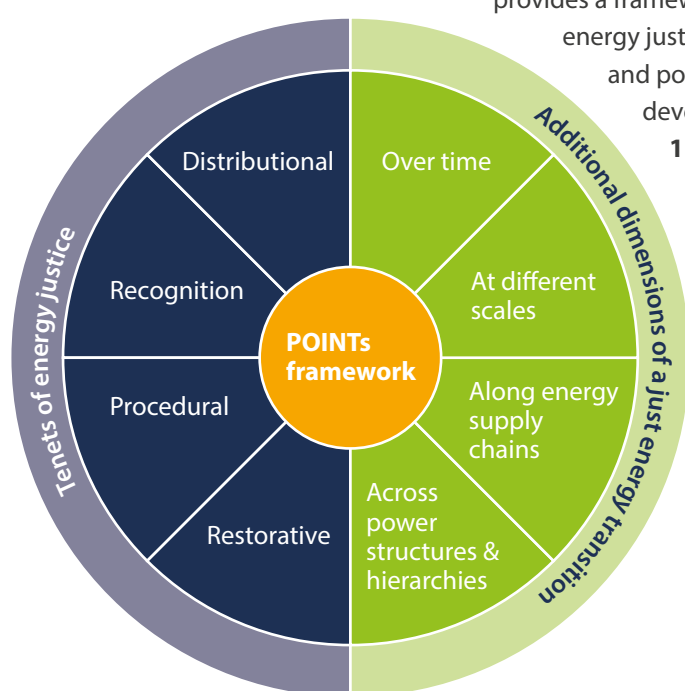
However, while deprived communities may not be primarily concerned with lowering their carbon emissions, opportunities to reframe low carbon transitions as supporting economic development and local regeneration can appeal to deprived areas (Lacey-Barnacle, 2020).

This is exemplified in Indianapolis through the '[Thrive Indianapolis](#)' plan, which outlines the city's aims to reduce emissions to net zero by 2050 whilst also increasing community resilience and reducing social inequalities. To do this, they use a co-benefits approach that treats reduction in greenhouse gas emissions as just one of many beneficial outcomes of the actions they are implementing to achieve their overall goal to build a thriving, sustainable and resilient city.

Embedding energy justice in net-zero transitions

It is clear that the energy transition to net-zero needs to be socially inclusive and equitable. While a number of policy tools can help support this approach (Abram et al., 2020) there is the need for a wider framework or lens through which policy impact can be explored at the wider system level to help mitigate against unintended consequences.

Energy Justice POINTs (Policy Overview and Impacts for Net-zero Transitions) – see **Figure 1** – provides a framework to help decision makers explore the wide-reaching energy justice implications of their net-zero visions, strategies, and policies. It takes a whole-systems approach and has been developed through a review of the literature (see **Appendix 1** for description of methods).



The goal of this work is to create a useful and usable framework for policy makers and practitioners to examine the energy justice implications of policies or strategies to deliver net-zero. It takes inspiration from [The Energy Justice Workbook](#) developed by Shalanda Baker, Subin DeVar and Shiva Prakash at the Initiative for Energy Justice, and extends the ideas developed by the workbook to build on the wider substantial body of energy justice literature.

Figure 1: The Energy Justice POINTs framework

The following sections outline the development of the Energy Justice POINTs framework, discuss how it can be used, and provide a worked example of how the framework could be applied to a specific project.

The four tenets of energy justice

Energy justice is a term that's been widely used in social science research literature as well as public policy literature in the context of global decarbonisation, climate change mitigation and the transition to a green economy (Healy and Barry, 2017). Many scholars refer to the 'three tenets of energy justice' to describe the three underlying principles of distributional,² recognition and procedural justice:

Distributional justice

There are two interlinked aspects to distributional justice. The first is location, relating to the fact that energy infrastructure can be unevenly distributed spatially. This can be due to operational reasons (for example because wind turbines needing to be sited in locations where they will have the best output) but it can also relate to socioeconomic factors. For instance polluting forms of energy production can often be situated within areas of social deprivation (McCauley et al., 2019). Additionally, low carbon domestic technologies (such as solar PV, batteries, EVs, heat pumps and smart appliances) are often only available to those who can afford to purchase them. This leads to the second aspect of distributional justice: the benefits and impacts of energy system transformation can also be unequally distributed between people and communities. Distributional justice therefore seeks a more even sharing of these benefits and impacts across society, regardless of income, race, gender etc. to reduce inequalities (Jenkins et al., 2016).

Questions to ask when considering distributional justice include:

- **What are the primary benefits? Are there any second order benefits?** For example, policies supporting greenhouse gas emission reductions in cities could have health benefits due to reduced air pollution; economic benefits due to reduced hospitalisation; and wider social and environmental benefits due to reductions in carbon emissions in line with targets for climate action.
- **Who are the intended beneficiaries?** This could focus on particular groups defined by geography (e.g., those in a particular region), or socio-demographics (e.g., those living in social housing, those who travel on public transport, those in fuel poverty etc.).
- **Are there structural reasons why certain groups may be unintentionally excluded or marginalised?** For example, gender-neutral policies could have gendered impacts due to unaccounted for differences in working or travel patterns by men and women.
- **What are the costs (economic and beyond), who is bearing them, and how are these costs distributed?** Explore potential unintended consequences that may result in additional unforeseen impacts, including financial consequences for future generations.

² Sometimes referred to as distributive justice. Distributive justice is used more commonly in environmental justice literature, with distributional justice used more commonly in energy justice literature (Jenkins et al., 2020b)

Recognition justice

This refers to the inclusion and fair representation of all stakeholders. It recognises that not all members of society are equally valued in current socio-cultural, economic and political arrangements, and that climate change and transitional policies could threaten to exacerbate these existing inequalities (Abram et al., 2020). Recognition justice therefore seeks to identify people and cultures who could be, or who have previously been, misrepresented, disadvantaged or exploited through energy system processes (McCauley et al., 2019).

It advocates for the fair treatment of all people, regardless of social, economic, cultural, ethnic, racial and gender differences.

Questions to ask when considering recognition justice include:

- **Who does this policy serve? Is it based on the dominant cultural groups (often aligned with white male identity) or are different groups explicitly considered?**
- **Are there any groups of people who are either not recognised or misrepresented in the future scenario/society this policy aims to deliver?** This could be unintentional due to replication of historical bias in how different groups of people with different identities are accounted for.
- **Does the policy value all members of society in an explicit rather than an assumed way?** Implicit recognition can suffer from hidden forms of bias, so it's important to articulate how the policy ensures that all members of society are valued and treated fairly.
- **How does the policy level the playing field for access to energy services or benefits for those people who may suffer injustice in the current system?**

Procedural justice

This refers to how different stakeholders are involved in decision-making processes and calls for equitable procedures that engage all stakeholders in a non-discriminatory way. It therefore aligns both distributional justice and recognition justice by giving people fair representation through appropriate and fair decision-making channels.

Questions to ask when considering procedural justice include:

- **What channels have been employed to provide stakeholders with input to decision making processes? Are these channels appropriate for all stakeholders? Have a range of channels been implemented to increase participation?** For instance online consultations may be inappropriate for older people while 'roundtables' may be inaccessible to those who work during the day or have caring responsibilities.
- **Which stakeholders have been actively engaged? Are there biases toward particular groups due to the engagement channels used?**
- **Are there any groups who have been systematically (if unintentionally) shut out due to the processes implemented?**
- **How has stakeholder input been accounted for in the decision-making processes and resultant policies? Are some voices given priority for deliberate or unintentional reasons? Is this bias (if deliberate) transparent? If unintentional, what action can be taken to remove the bias?**

Restorative justice

Recently, a fourth tenet has gained traction, which is the concept of ‘**restorative justice**’. Restorative justice is based on the legal theory of criminal justice which calls for a process of remediation in response to past injustices. Restorative justice therefore aims to redress the past harm done to people, society or nature and can assist in pinpointing where prevention needs to occur (Heffron and McCauley, 2017).

Questions to ask when considering restorative justice include:

- **Which stakeholders or parts of society experience injustice in current policy or practice arrangements? Why is this the case? Are there underlying issues (e.g., social, political, economic etc.) that have created this past injustice?**
- **How might these groups be affected by new policies in terms of process and outcomes? Through what mechanisms is past injustice being addressed?**
- **Have these groups been engaged in this restorative process?**
- **Can this policy/ proposal alleviate previous landscape degradation or community erosion?**
- **Could the new policy create future unintended consequences?**

While these four tenets are inextricably entwined, the distinction between them is helpful for considering **where** injustices lie (*distributional*), **who** is affected (*recognition*), **how** injustices can be overcome (*procedural*) and **what** we can do to ameliorate past injustices and mitigate against future injustices (*restorative*) (adapted from Jenkins et al., 2016).

In addressing these questions it's important to account for embedded systematic cultural and historical bias that dominates the prevailing view of the world. Therefore, it is important to account for the perspectives from a range of stakeholders, especially those from under-represented and marginalised groups. In examining the energy justice impacts of policies and strategies these stakeholders may introduce perspectives that could otherwise remain unseen and lead to unintentional replication of injustices despite the good will of those seeking to drive positive change.

We therefore recommend that these questions are not answered by one person or individual stakeholder group alone, but are reviewed by a collective inclusive of diverse perspectives and backgrounds.

Justice beyond the four tenets

In addition to these four tenets of energy justice, it is worth considering how they manifest in energy system transitions. An examination of how energy justice is discussed in the literature helps explore the tensions, synergies and trade-offs between different perspectives and disciplinary approaches to examining justice (Jenkins et al., 2020b). This has led to the identification of four further dimensions of energy justice which are outlined in detail in the following sections:

1. At different geographic scales
2. Across power structures and hierarchies
3. Along energy supply chains
4. Over time

Bringing these four dimensions together with the four tenets of energy justice provides a framework for exploring how energy justice can be embedded into policies and practices for delivering net-zero.

At different geographic scales

As noted in the introduction, the energy transition to net-zero will play out differently in different parts of the world. There is no single transition pathway for countries and regions to take; energy justice considerations and outcomes will look different in different parts of the world. For example, some countries will be moving away from a dependence on fossil fuel extraction which underpins their economy, while others will be seeking to develop clean energy infrastructure. Furthermore, political processes, governance and participatory structures will also vary from country to country, and within countries. In this context it is important to recognise that there is no 'one size fits all' approach to energy justice.

Within countries there will also be variation in where, how and by whom energy transition is felt, with the frontline communities more immediately affected by change experiencing impacts more strongly (Graff et al., 2018).

This could be through a shift away from traditional industries such as coal mining leading to job losses in the region or through the emergence of new renewable energy and low-carbon technologies or infrastructure established within their communities and landscapes (e.g., wind farms, nuclear power plants). This variation has resulted in diversification of the energy sector, with a range of stakeholders at different scales, including households, communities, regions, as well as new – often smaller – businesses, joining the larger incumbent industry in different aspects of energy provision.

Scale is also an important factor in considering how climate action and energy system transition is being delivered in planning for local areas. In the UK, Local Governments are emerging as key stakeholders: declaring climate emergencies, setting net-zero targets for their regions, and developing place-based strategies through which net-zero can be delivered (Howarth et al., 2021). However, a national framework to co-ordinate this action is lacking, leaving local authorities to making decisions independently, which could be at tension with wider national ambition. This has been exemplified in the proposed coal mine in Cumbria (Willis, 2020), with local priorities around jobs in tension with national targets for carbon emission reductions that have not been devolved to localities or regions. Further challenges exist due to regional differences in capacity and resource to deliver change. Following a decade of budget cuts, and with climate and energy remaining non-statutory responsibilities, different local authorities are limited in how well they are able to deliver climate action. This raises risks that those areas with fewer resources that are focused on attending to other challenges such as housing, poverty and education are left behind in the net-zero transition. As a result we need to go beyond considering justice at a single scale – at the national level – or how it is distributed across whole populations -between individual households or workers – and instead we need to explore how justice can be embedded across different scales.

Questions to ask when considering the geographic scales across which energy justice can be embedded, include:

- **What are the opportunities for reducing regional disparities (Levelling Up)?**
- **Could the policies / practices have adverse effects on those outside of the community of interest? What can be done to mitigate against this?**
- **What are the opportunities for reducing socioeconomic disparities within communities?**
- **Is place-based decision making taking into account all available evidence?**

Across power structure and hierarchies

A just energy transition is not simply a technological or a sociotechnical matter; it can be described as a deeply political struggle since it is characterized by issues of power; distribution of, and access to, resources; political economy, and so on (Healy & Barry, 2017). Operationalising energy justice means positioning energy justice within the wider ambitions, values and decision making frameworks of those with the power to implement it, making sure to consider not only those groups who would benefit directly from embedding justice in energy transitions, but also those who are responsible, capable and accountable for delivering it (Jenkins et al., 2017, 2020a).

Powerful 'elites' have a pivotal role to play in energy transition, particularly in modern energy systems where resources have traditionally tended towards centralised control by states, and national and multinational energy companies (Sovacool and Brisbois, 2019). Indeed, elite power can operate at multiple scales – from local actors to transnational powers – in order to dispute and oppose climate change narratives and transitions (Sovacool et al., 2019a).

This means that energy transition processes and pathways can become intertwined with processes of inequality, exclusion, and injustice if due attention isn't awarded to the power of elites to resist, slow or shape low carbon transitions (Sovacool and Brisbois, 2019). This is exemplified by a study of Queensland (Australia), which illustrated how incumbent utility providers presented key threats for embedding justice in the region's energy transition through communicating a strong "environment versus jobs" narrative in order to maintain their position (Goddard and Farrelly, 2018). Goddard & Farrelly suggest that a long-term vision combined with a managed approach to energy transition has the potential to overcome incumbent influences and potential lock-in to existing hierarchical structures. In addition, building strong actor networks within affected communities can encourage bipartisan support and mitigate possible distributional impacts.

There is also the potential to engage with powerful elites in driving positive and pervasive change, for example, by embedding or aligning energy justice approaches with pre-existing political and economic systems (Jenkins et al., 2020b). For example, by quantifying energy justice to assess how different countries perform (Heffron et al., 2018), developing energy justice checklists for key decision makers (Sidortsov and Sovacool, 2015), or economising energy justice through the introduction of equitable tariffs to help enact regulations that promote higher levels of energy justice (Alvial-Palavicino and Ureta, 2017).

Powerful elites do have a role to play in energy transitions, given their inherent self-interest. It is therefore important to drive consensus building across a wide range of stakeholders, including governments, donors, public and transnational actors, to ensure consistent long-term vision and policies that embed energy justice in decision-making frameworks. It's equally important to create space for new actors and business models aligned with energy justice principles, as well as provide opportunities for wide scale public buy-in for driving forward a momentum for change that can counteract elite voices and leverage their interests to align with energy justice processes and outcomes (Ford and Hardy, 2020; Goddard and Farrelly, 2018).

Implementing a more democratic approach to decision making can help build trust, increase perceptions of fairness, and improve levels of “buy in” from different stakeholder groups to a degree that can overcome the presence of negative impacts (Becker et al., 2019; Haggett, 2009; Wolsink, 2007).

Local, community and civic stakeholders are becoming increasingly important and engaged with energy transitions. This is due in part to the scale and distributed nature of renewable generation technologies, many of which can be incorporated into households such as solar PV, heat pumps, battery storage, EVs etc. This brings the new energy system much closer to people and the communities in which they live, thus enabling individuals, cooperatives and small companies to invest in owning and operating energy infrastructure themselves.

Additionally, with the increase in privately or community owned ‘behind the meter’³ technologies, located in people’s homes and businesses, these are not subject to traditional energy utility regulation (Tagliapietra et al., 2019) enabling people to take autonomy. Therefore, as many new processes are being operated and delivered by individuals and cooperatives themselves (rather than being delivered by hierarchical traditional energy industries and financing regimes) these point to the need for a new energy democracy in which people can participate.

A study of 46 community energy organisations across Europe (including cooperatives, social enterprises, energy communities and not-for-profit organisations) found that their identities were deeply rooted in human-centric values and goals (Campos and Marín-González, 2020). These organisations had an inherent conviction that rather than having large foreign company “oligarchies” service local communities, renewables opened the door to a new energy paradigm, where energy is safer and fairer. Campos and Marin-Gonzalez therefore argue that the current energy transition should result in a reconfiguration of what energy is, from a commodity excluding some people and reifying prevalent hierarchies, to an essential and vital good.

It is of course excellent news that more participatory processes are being developed and communities are being afforded opportunities to embed energy justice principles into both local and national decision-making. However, some processes are still hampering community participation. One example is the loss of the feed in tariff in the UK as of April 2019. It was predicted that this would severely undermine the financial viability of new community projects going forward (Regen, 2018) but was cut by the Government despite the fact that 90% of respondents to the Government’s consultation of this said they were opposed to its loss (BEIS, 2018).

3 Domestic onsite generation technologies are commonly known as ‘behind the meter’ technologies as they are situated on the energy user’s side of the meter and can affect the amount of imported (metered) electricity used by the customer.

In addition, some communities may be less well equipped to engage in, or resource, community-led projects. We therefore need to connect local 'bottom up' approaches with national level action to ensure energy justice is appropriately embedded in decision-making processes across the political spectrum.

Questions to ask when considering how energy justice interplays with politics, power, and decision making hierarchies include:

- **How are stakeholders from citizens and communities to large organisations and elites influencing policy, research, and data? What strategies are in place to ensure that no one voice has undue influence?**
- **How might the proposed policy/strategy impact this diversity of stakeholders? Might there be negative impacts to incumbents that needs to be managed?**
- **What are the opportunities for greater inclusivity in decision-making / ownership / local trading & business models? How will the policy/strategy diversify power structures?**
- **How are different values held by different actors accounted for and how are trade-offs made? And how are decisions being held to account by and for these stakeholder groups? And how are these processes being legitimised?**

Justice along supply chains

It is too simple to view the energy system only through the lens of the end-users who could reap multiple benefits from renewable and low carbon technologies in their household, workplace or local community, such as lower energy bills, energy efficiency, warmth etc., or through the lens of local environmental benefits such as improved air quality. We must also take into account the range of impacts caused across the whole lifecycle, many of which can take place hundreds, if not thousands, of miles away from the end-user.

The technology life cycle consists of extraction; production; operation and supply; consumption and waste management (Heffron and McCauley, 2017). Global justice considers energy justice across the whole technology lifecycle, including the supply chains that are embedded within that lifecycle. Global justice therefore considers how the costs of extraction, consumption and eventual disposal of fossil fuel wastes are unevenly distributed across different populations around the world (Healy and Barry, 2017).

Sovacool identifies many global issues of injustice within these lifecycles, including:

- the manual extraction of cobalt to be used in EV batteries in the Democratic Republic of the Congo by women and children working in unsafe and unsanitary conditions;
- contaminated water supplies in France from nuclear incidents that have destroyed indigenous vineyards;
- the loss of approximately 64,000 jobs in solar PV manufacture in Germany due to subsidised Chinese manufacturing; and
- the export of nearly half of the UK's e-waste to a single scrapyards in Ghana (the equivalent of 250 shipping containers of e-waste arriving every month (Sovacool et al., 2019a).

Therefore if a Just Transition entails “creating environmentally sustainable economies and societies for all” (ILO, 2015) countries should not be able to offset their carbon emissions and technological waste overseas without accounting for it within their own carbon budgets.

Questions to ask when considering energy justice across global supply chains include:

- **What are the whole lifecycle implications and impacts?**
- **What impacts might be felt by businesses or communities along the supply chain? Might there be negative unintended consequences?**
- **How are businesses and communities along the supply chain being engaged? Are they being exploited or is there a way to give them voice?**
- **How can social inequities along the supply chain be mitigated, for example, by altering procurement frameworks to account for fair trade / environmental degradation, and embed this within existing frameworks?**

Energy transitions and justice over time

Energy transitions don’t happen overnight; they can take decades or generations, even for relatively wealthy, small, and committed countries (Gambhir et al., 2018; Sovacool, 2017). Given the need to deliver net-zero by 2050 at the latest, this means action is required now. This is especially pertinent when we consider that it can take up to several decades for different technologies to move through from research and development to production, to market and end-user take-up (Gross et al., 2018). The cost curves associated with new technologies may change over time with costs decreasing as production and performance increases. There may be changes in benefits associated with diminishing returns on investment as deployment increases. In addition, investments made today may take time to deliver returns, or may be dependent on changes to other parts of the energy system. Therefore, the links between the cost of transition and the benefits that will accrue is not straightforward.

There is also a time dimension involved in when to commence the closedown of existing fossil-fuel based industries and start to transition these towards future opportunities. For instance, it is better to engage and act early while those industries are still viable, rather than reacting later once they may have gone into liquidation or do not have the finances available to invest in a smooth transition which also supports their existing workforce, for example, through skills training.

Gambhir et al., state that this means implementing ‘proactive’ rather than reactive policies:

“Reactive policies are aimed at helping workers in sectors negatively impacted by a low-carbon transition and include income support, retraining and career support, job transfers which help displaced workers into new jobs, pension bridging and workforce transition plans. Proactive policies are aimed at maximising the long-term benefits of the transition and include labour market modelling to identify sectors where skills are needed, targeted skills training, industrial transition support to help firms shift from high to low carbon activities, and geographically targeted public spending to help vulnerable regions.” (Gambhir et al., 2018)

Implementing proactive policies can also reduce the likelihood of future harm, for example, through implementing transition frameworks for workers in polluting industries (Abram et al., 2020) or through deliberately considering the effects of current decisions on future generations. As Muttitt notes:

“leaving things until carbon budgets are mostly exhausted would result in disruptive change that would be sudden, costly, and painful. By starting now, the transition can be managed efficiently and fairly, to the maximum benefit of everyone involved.”
(Muttitt, 2016)

Sovacool et al (Sovacool et al., 2019b) drawing from earlier research (Sovacool et al., 2017; Delina and Sovacool, 2018), discuss 10 energy justice principles for decision-makers. Two of these principles relate to intragenerational equity (all people have energy rights) and intergenerational equity (future generations also have a right to enjoy life undisturbed by the damage caused today).

The latter is reminiscent of the First Nation’s 7th Generation principle, which, based on an ancient Haudenosaunee philosophy, highlights that whenever a new policy or proposal is considered, decision-makers should carefully appraise its impact seven generations into the future, with regard to the health and social welfare of these future generations.

While in the UK our planning frameworks rarely reach as far as considering seven generations into the future, there are examples of long-term thinking in the Government’s 2050 net-zero target, Local Authority Climate Energy Plans and Local Development Frameworks (which normally include at least a 20-year vision of what a local area wishes to achieve) etc. However, long-term planning should not mean ‘kicking the difficult decisions further down the road’. Action should be taken today to secure benefits for future generations.

Questions to ask when considering the temporal elements of energy justice include:

- **Is the policy / practice proactive in seeking long-term benefits?**
- **Who / what could be adversely impacted by the policy / practice over time and how?**
- **Will the policies / practices adversely impact future generations?** For instance through cost burdens; erosion of landscape or lock-in to a particular trajectory (e.g. hydrogen boilers)?
- **What measures could be put in place to mitigate against future generations being unfairly burdened by policies and decisions taken today?**



Using the Energy Justice POINTs framework

Bringing the four tenets of energy justice together with the four dimensions of energy justice emerging from the literature provides a framework for considering how different components of energy justice might be embedded into net-zero energy transitions. This focus on social equity can help put people into the heart of policy making and decision-making frameworks, alongside the more traditional focus on economic, climate, and environmental impact.

The Energy Justice POINTs framework and associated questions can help decision makers explore the wide-reaching energy justice implications of their net-zero visions, strategies, and policies. This is just as important for reactive policies that look to address past and present injustices, as it is for proactive ones trying to get ahead of the curve and deliver a just transition into the future. This could have benefits for a wide range of stakeholders, for instance by reducing regional economic disparities through targeted provision of jobs and training initiatives. It's therefore important to design policies not just for the current system, but proactively for the future system that reflect on the questions of who wins/loses, how, why, and when, across time, geography, supply chains, and decision-making hierarchies. We have provided a guide for using the framework through a worked example of a specific project which took place in Cornwall, the Cornwall Local Energy Market (LEM) project. Background context on the Cornwall LEM project is provided in Box 2 below to aid understanding.

Box 2: The Cornwall Local Energy Market

The Cornwall Local Energy Market was a four year trial (2016-2020) jointly funded by the European Regional Development Fund and Centrica. The aim of the trial was to unlock network capacity through intelligent management of supply and demand in constrained areas of the distribution network in Cornwall. This was achieved by installing a range of renewable and storage devices in homes and businesses and setting up an online trading platform to allow Western Power Distribution (WPD) who are the Distribution Network Operator (DNO) for Cornwall, along with National Grid, to purchase flexibility services from project participants.

The Cornwall LEM recruited participants from across Cornwall to take part in the trial; these included industrial & commercial customers, SMEs, and one hundred households. The households received solar panels, smart batteries and monitoring equipment through the project; enabling them to act as a 'Virtual Power Plant', the largest of its kind at the time in the UK. The energy they produced was aggregated and controlled remotely to provide a single block of power in trading events. In addition, the project installed a range of devices to 87 businesses; including solar, wind, storage and CHP technologies, as well as energy monitoring devices and training opportunities to enable these participants to also trade on the platform.

All text taken from Future Prospects for Local Energy Markets: Lessons from the Cornwall LEM (Bray et al., 2020)

POINTS Framework – worked example

	Distribution	
1	<p>What are the primary benefits? Are there any second order benefits? For example, policies supporting greenhouse gas emissions reductions in cities could have health benefits due to reduced air pollution; economic benefits due to reduced hospitalisation; and wider social and environmental benefits due to reductions in carbon emissions in line with targets for climate action.</p>	<p>Design and rollout of an online trading platform in conjunction with the installation of renewable and low carbon technologies at 100 households and approx. 100 business premises.</p> <p>This leads to:</p> <p>Reduction in carbon, lowering of energy bills for participants, ability to trade (earn revenue) for participants, unlocking of network congestion through market mechanisms.</p>
2	<p>Who are the intended beneficiaries? This could focus on particular groups defined by geography (e.g., those in a particular region), or socio-demographics (e.g., those living in social housing, those who travel on public transport, those in fuel poverty etc.).</p>	<p>LEM participants (had to be resident in Cornwall).</p> <p>WPD (through enabling better management of distribution network / unlocking network constraints).</p> <p>WPD and National Grid through trialling procurement of different market mechanisms.</p> <p>Ofgem & BEIS through better understanding of policy mechanisms.</p> <p>General population through lowering of greenhouse gas emissions.</p>
3	<p>Are there structural reasons why certain groups may be unintentionally excluded or marginalised? For example, gender-neutral policies could have gendered impacts due to unaccounted for differences in working or travel patterns by men and women.</p>	<p>Project specifically targeted at Cornwall; therefore only available to Cornish residents & businesses.</p> <p>Householders had to be home owners, therefore excluded other forms of housing tenure.</p>
4	<p>What are the costs (economic and beyond), who is bearing them, and how are these costs distributed? Explore potential unintended consequences that may result in additional unforeseen impacts, including financial consequences for future generations.</p>	<p>Financial costs were covered by EU funding (European Regional Development Fund) and Centrica plc.</p> <p>The project financially benefitted the LEM participants, but it also put them at an advantage to other Cornish residents and businesses who were unable to join the LEM trial and therefore also benefit from any potential returns from market trading, reduced electricity costs and the installation of free equipment.</p>

Recognition		
5	Who does this policy serve? Is it based on the dominant cultural groups (often aligned with white male identity) or are different groups explicitly considered?	Cornish home owners and business owners. Centrica plc through learning by doing. WPD and National Grid through learning by doing.
6	Are there any groups of people who are either not recognised or misrepresented in the future scenario/ society this policy aims to deliver? This could be unintentional due to replication of historical bias in how different groups of people with different identities are accounted for.	This was a specific time bound trial, therefore it worked with a narrow category of participants. However within the parameters of the project there was attempt made to include a representative percentage of the Cornish population by age, income, household size and location for the householder trial. Some businesses weren't able to proceed with the trial due to their location on the distribution network (e.g. weren't able to obtain an export connection).
7	Does the policy value all members of society in an explicit rather than an assumed way? Implicit recognition can suffer from hidden forms of bias, so it's important to articulate how the policy ensures that all members of society are valued and treated fairly.	As Q6
8	How does the policy level the playing field in terms of access to energy services or benefits for those people who may suffer injustice in the current system?	Can be argued that it only served those who already had economic means (e.g. home owners / business owners).

Procedural		
9	What channels have been employed to provide stakeholders with input to decision-making processes? Are these channels appropriate for all stakeholders? Have a range of channels been implemented to increase participation? For instance online consultations may be inappropriate for older people, while 'roundtables' may be inaccessible to those who work during the day or have caring responsibilities.	This was a limited trial and it had more initial applicants than the trial could cater for, so participant recruitment of the project wasn't an issue. However, if the project were to be rolled out to a wider audience then more consideration should be given to methods of recruitment to ensure fairness.

Procedural		
10	Which stakeholders have been actively engaged? Are there biases toward particular groups due to the engagement channels used?	The project included a householder stream and a business stream. Business participants had ongoing engagement through a series of seminars aimed at increasing their knowledge of energy trading. Householder participants were engaged through a one-off seminar towards the end of the project. Participants were also able to provide feedback via surveys and interviews and all participants had a dedicated contact person on the project for any queries / concerns.
11	Are there any groups who have been systematically (if unintentionally) shut out due to the processes implemented?	All participants were engaged throughout the project. Any Cornish businesses could attend the seminar series whether they were project participants or not. However, only householders participating in the project could attend the householder seminar. In addition, the end of project dissemination event was open to anyone to attend.
12	How has stakeholder input been accounted for in the decision-making processes and resultant policies? Are some voices given priority for deliberate or unintentional reasons? Is this bias (if deliberate) transparent? If unintentional, what action can be taken to remove the bias?	The UoE were independent project partners who conducted surveys with all the householder and business participants and held interviews with a cross sample of these. These findings were included in the overall project findings. However as this was a time-bound project, the findings were aimed more at informing future policies and procedures rather than the project itself.

Restorative		
13	Which stakeholders or parts of society experience injustice in current policy or practice arrangements? Why is this the case? Are there underlying issues (e.g., social, political, economic etc.) that have created this past injustice?	Due to the LEM being a time-bound trial with specific participant requirements for recruitment, this effectively excluded anyone who didn't meet these requirements.
14	How might these groups be affected by new policies in process and outcomes? Through what mechanisms is past injustice being addressed?	If the LEM were to be rolled out as an ongoing project then mechanisms should be used to engage with, and recruit from, a wider participant pool.
15	Have these groups been engaged in this restorative process?	Not known.

Restorative		
16	Can this policy/ proposal alleviate previous landscape degradation or community erosion?	If this project were to be rolled out across Cornwall then there could be multiple community benefits – these benefits would depend on a range of factors such as who was running the project, what business models were utilised, how the project was financed, and how any profits were recycled / shared.
17	Could the new policy create future unintended consequences?	If this project were to be rolled out it could disadvantage those who cannot participate due to them not being able to trade or benefit from reduced electricity costs. Therefore consideration needs to be made regarding who could / should participate, and what measures could be implemented to assist those who cannot participate.

Geographic scales		
18	What are the opportunities for reducing regional disparities (Levelling Up)?	This project was based in Cornwall which is recognised in the Index of Multiple Deprivation as having 17 neighbourhoods in the 10% most deprived areas in England. The LEM model could help alleviate deprivation in Cornwall through local energy trading and supply, local ownership of technologies, keeping energy spend within the area, local job creation etc.
19	Could the policies / practices have adverse affects on those outside of the community of interest? What can be done to mitigate against this?	As Q17
20	What are the opportunities for reducing socioeconomic disparities within communities?	As Q18
21	Is place based decision making taking into account all available evidence?	If this project were to be rolled out further then full cooperation of the LA would be required to ensure that this was administered fairly and in accordance with the LA evidence base and development plans.

Politics, power, decision making hierarchies		
22	How are stakeholders from citizens and communities to large organisations and elites influencing policy, research, and data? What strategies are in place to ensure that no one voice has undue influence?	The research was primarily undertaken for Centrica, WPD, National Grid, BEIS and Ofgem to discover how new local market solutions could work in practice. UoE also undertook independent research with project participants to understand what benefits or impacts the project had on them and their thoughts about how they envisaged the project could be extended to benefit the wider community.
23	How might the proposed policy/strategy impact this diversity of stakeholders? Might there be negative impacts to incumbents that needs to be managed?	If the LEM were to be rolled out nationally it would create new business models which would impact on traditional energy suppliers. Suppliers are however aware that they need to be forward thinking in how markets could change over the next few years.
24	What are the opportunities for greater inclusivity in decision-making / ownership / local trading & business models? How will the policy/strategy diversify power structures?	If the LEM was to be rolled out further it could create a much more democratic model of electricity trading than at present due to, for example, private ownership of technologies; trading via local platforms; community involvement in the siting of community owned renewable infrastructure; distribution of profits; local electricity pricing etc.
25	How are different values held by different actors accounted for and how are trade-offs made? And how are decisions being held to account by and for these stakeholder groups? And how are these processes being legitimised?	This was a trial project and therefore was bounded by the scope of the trial and the expectations of the trial partners. However participants were enabled to give feedback on their own experiences in order to help shape any future decision-making.
Global supply chains		
26	What are the whole lifecycle implications and impacts?	Participants were gifted renewable and low carbon technologies which were purchased by Centrica. Participants had no say in the type or manufacturer of technologies and the lifecycle implications are unknown. However thought should be given to the disposal of this equipment at the end of its life span (if not already done so).

Global supply chains		
27	What impacts might be felt by businesses or communities along the supply chain? Might there be negative unintended consequences?	Global impacts of the technology production are unknown. However, if the LEM concept were to be introduced at scale this would impact on the business models of energy providers and transmission and distribution operators. However, these actors are aware that their existing business models are under threat and will need to be adapted in order to reach net zero.
28	How are businesses and communities along the supply chain being engaged? Are they being exploited or is there a way to give them voice?	Not known.
29	How can social inequities along the supply chain be mitigated, for example, by altering procurement frameworks to account for fair trade / environmental degradation, and embed this within existing frameworks?	If the LEM were to be continued further, assessment of procurement should be taken to ensure that technologies have been fairly sourced and produced. Likewise with the removal and disposal of end-of-life waste materials.
Temporal aspects		
30	Is the policy / practice proactive in seeking long-term benefits?	This was a specific time-limited trial. However the reason for the trial was to show how a local market could provide long-term environmental and social benefits rather than a 'business as usual' scenario.
31	Who / what could be adversely impacted by the policy / practice over time and how?	Anyone unable to participate e.g. through finances, position on network, housing tenure etc. Therefore further solutions to addressing participation would need to be considered in any future rollout of a LEM.
32	Will the policies / practices adversely impact future generations? For instance through cost burdens; erosion of landscape or lock-in to a particular trajectory (e.g. hydrogen boilers)?	If the LEM were to be rolled out then it could lead to a decentralised, electricity-focussed energy system. It could also lead to one local monopoly LEM facilitator/owner. Care needs to be given to who that owner should be and what impacts that could have on consumer choice.
33	What measures could be put in place to mitigate against future generations being unfairly burdened by policies and decisions taken today?	One of the biggest hurdles to be overcome is in financing a LEM to enable participants to benefit from renewable and low carbon technologies. This cost burden shouldn't be borne by future generations.

NOTE: All analysis given in the table is derived from published work on the Cornwall LEM project (Bray et al., 2020, 2018; Bray and Woodman, 2020a, 2020b) and may not represent the views of all the original authors or Centrica plc.

Appendix 1: Methods

This appendix details the methodology employed in the current study, which underpins the findings and insights presented in the main report. The research is based on a rapid realist review of the abundant literature published in peer-reviewed journals regarding justice and social equity in energy transitions; the role of technologies in net-zero energy transitions; and the potential economic and prosperity benefits of a net-zero transition.

Approach

This process of reviewing literature is similar to the process of primary research but at a higher or 'meta' level. Primary research goes and collects data from research participants. Systematic reviews use these primary studies as their sample. A systematic synthesis uses the results of the primary research studies to answer the research review question(s).

A realist review is one that attempts to include and describe complexity of interventions, in terms of not only what works, but how and for whom, under what circumstances. A rapid realist review then, is one that is faster to deliver than the traditional realist systematic review, in order to respond to policy issues that are emerging and time sensitive. The limits a rapid review may be applied to achieve this can be the number of sources searched, or the types or quality of evidence, or rapid quality assessments, but is explicit in what way trade-offs, if any, are made between an exhaustive and comprehensive review to a timely and useful systematic review.

Taking these aspects together, we applied an "agile" systematic review method, one that responds to and identifies review priorities, is iterative and reflective, includes consideration of complicated and complex aspects of interventions, and develops, tests and refines theory on how an intervention does or could work.

Rapid Realist Review Search strategy

The literature review was conducted through an online search in Scopus using defined search terms connected to the subject of the review to identify relevant peer-reviewed journal articles. We used different search terms in combination (adding, altering or removing terms where necessary) to arrive at a list of documents which was sufficiently broad and manageable given the constraints of a rapid review. Searches terms included:

- Energy justice
- Justice in energy transitions
- Social equity in energy transitions
- Benefits/Impacts of net-zero energy
- Benefits/Impacts of renewable energy

- Benefits/Impacts of decarbonisation
 - Benefits/Impacts of energy systems
 - Benefits/Impacts of energy transition
-

Screening process: applying inclusion and exclusion criteria

All papers found through the online search were screened for relevance to the study by two researchers until high levels of agreement were reached. Inclusion and exclusion criteria was first applied to titles and abstracts where available. Where the title and abstract provide insufficient information to be certain, the full paper was assessed and the inclusion and exclusion criteria reapplied. Those that did not meet these criteria were excluded from the study, although have been counted as excluded under the initial search term for completeness. All included studies were added to Zotero (a reference management database) and held under the initial search term and any duplicate articles discounted from the final total.

Inclusion criteria

All documents were assessed for inclusion based on the following criteria:

- Published in English
- Substantive description of perceived just / unjust outcomes that can arise from energy transition
- Studies with a focus on energy were prioritised for inclusion, with studies in other areas included on the basis of theoretical and practical relevance to justice outcomes
- Study had to present clear methods for their research

Exclusion criteria

Since the scope of this review was concerned with the delivery of a just net-zero energy transition, we excluded documents which met at least one of the following exclusion criteria:

- Were not applicable to a net-zero energy approach
- No relevant just / unjust outcome was identified
- Documents based on technical calculations rather than concepts

Following application of the inclusion / exclusion criteria, a total of 122 studies were included for analysis (see Figure 2).

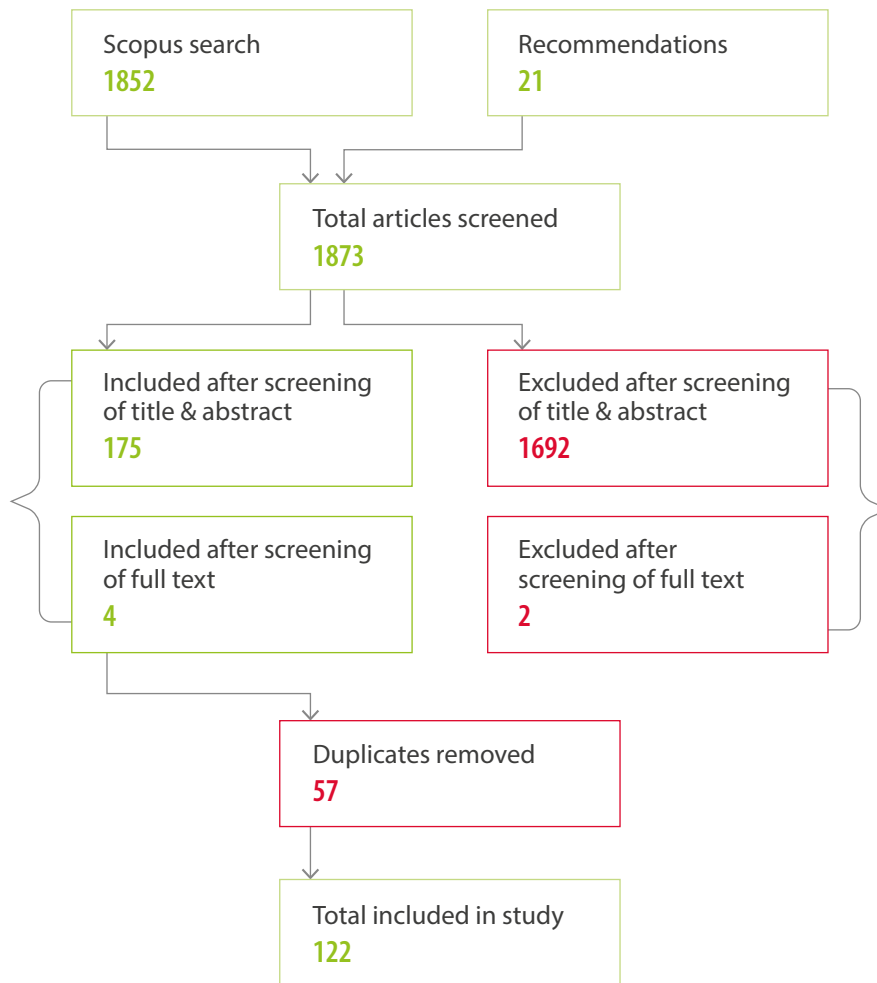


Figure 2: Studies remaining after search, screening, and inclusion/exclusion processes

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About ALIGN

Project ALIGN (ALigning Impacts for Getting to Net-zero) is one of four unique Fellowships, funded by UKRI, to support engagement with the international climate negotiations in the run up to the 26th Conference of the Parties of the UN Framework Convention on Climate Change (COP26) through the provision, synthesis, translation and interpretation of scientific evidence.

ALIGN aims to provide evidence around the multiple benefits of a just net-zero energy transition (JNT). Appropriate climate change actions offer the potential for delivering multiple benefits, e.g. post-pandemic economic recovery, advancing UN sustainable development goals. There is an opportunity for countries to leverage economic and social gains in net-zero transitions, enhancing political currency and social legitimacy. However, without a comprehensive approach or framework for considering the multiple benefits or impacts of transition, existing injustices could be amplified, and new vulnerabilities created in the wider economy.

This programme of work is innovative in bringing together insights and evidence from areas traditionally siloed, aligning the case for a just transition with financial, environmental, and other outcomes, and feeding into wider decision-making frameworks (e.g. at UNFCCC level). It builds on aligned work, and focuses on Glasgow and Scotland as exemplars for delivering a socially just net-zero transition, while providing frameworks and evidence to make the case for the multiple benefits (e.g. resilience, prosperity, health, etc.) of a just net-zero transition in other countries, accelerating COP 26 outcomes.

