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# Justice in the transition to a low carbon economy

A working paper by the Cambridge Institute for Sustainability Leadership

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# 1. Introduction

Transitioning to a low carbon economy represents one of the most significant and urgent challenges facing society today. While the evidence base for this shift is ever more compelling and the technology to support it is rapidly emerging, there remains a pressing need to engage with the fairness of the social, economic and environmental impacts associated with the transition. The nature of the challenge may have some similarities with critical junctures of the past, but none of the past transitions faced intertwined social, technological, and ecological problems of the scale facing human kind in the early 21st century. There is an undeniable risk of inducing irreversible damage to the planetary environmental systems on which life depends.

A more explicit consideration of justice issues in the transition to a low carbon economy is increasingly called for by both governmental and civil society actors in national and international fora. The wide range of issues being considered in notions of a just transition include the asymmetric impacts of climate change on developed and developing countries and regions; fair distribution of costs and benefits of climate policy and employment/skills issues; differing vulnerabilities and capacities to address mitigation and adaptation; and attribution of responsibility for greenhouse gas emissions (both historic and into the future). With regard to justice in the overall process of transition there are also issues of transparency, participation and legitimacy in decision-making.

The transition will, of necessity, require the involvement and support of a diverse range of actors for whom both the outcome and the process of achieving a low carbon economy must be fair. The concept of justice takes a central place in the interactions among policymakers, businesses and civil society. In this report we consider how a justice approach could inform sustainability leaders in policy-making and business circles.

The rationale for a study on the implications of justice for the transition has grown out of *Rewiring the Economy*, which constitutes CISL's ten-year plan to lay the foundations for a sustainable economy. The plan is based on insights gathered over a quarter of a century working with business, government and finance leaders, describing a broad ambition that a sustainable economy should deliver health, education and equality of opportunity for all, alongside justice (CISL, 2015, p.5). Within this framework businesses are being encouraged to seek models of value creation that generate a fair social contribution within the natural boundaries of the planet.

Accordingly, enabling a just transition to a low carbon society (alongside leadership development and natural resource scarcity) is a key theme of future CISL activity. In this context, the subject of this paper is to:

- review the various conceptions of justice
- explore how it has been taken up in key international policy and business circles
- present well-known 'thinking tools' that may support decision-making towards more explicitly just transitions to a low carbon economy
- Conclude with some worked examples of how such approaches might usefully inform policy and corporate sustainability strategies.

## 2. The nature of justice in the transition context

Justice is a moral concept with the general notion that people should give and be given what is fair and well deserved. Thinkers from ancient times (Aristotle, Nichomachean Ethic, Book IV) have seen justice both as a principle to be embedded in all social institutions and as a desirable virtue in

individuals. The Enlightenment gave rise to Utilitarianism, perhaps the approach that is most familiar to a wider audience, focusing on the consequences of actions and arguing that the best action is that which maximises desirable outcomes (or utility). More recently the work of John Rawls including *A Theory of Justice* (1972) has been very influential and helped to stimulate wider study of justice and what it means in practice. Rawls considered what might constitute universally accepted just institutions and frameworks that would then deliver just outcomes. In doing so he highlighted concerns when a utilitarian (maximising benefit) approach is taken, advocating an approach that prioritises the most disadvantaged. Table 1 seeks to summarise the three main moral stances associated with notions of justice.

Rawls did not consider environmental concerns explicitly but more recent justice thinkers building on his work consider environmental sustainability to be critical. It is increasingly understood that there may be no social justice without environmental justice. Overall, the rights of non-human species and ecosystems, justice *across* generations, and justice at different spatial scales (ie globally, nationally and locally) have all come to the fore of this debate.

The work of Amartya Sen, including *The Idea of Justice* (2009), brings in a pragmatic approach looking at both outcomes and the process, and suggests a clearer ranking of options in complex situations where identification of a single, perfectly just solution is elusive. Sen has built on existing thinking to describe a capabilities based approach. Capabilities are about a person's opportunities to do and be what they choose – to fully function in lives of their choosing – without compromising the freedom of future generations to do the same.

**Table 1. Moral principles associated with justice**

Moral Principle	Meaning
Utility	Decisions are made according to maximum overall utility, regardless of costs and disadvantages to some
Equality	Every person should be treated equally, therefore decisions benefit everyone in the same measure, regardless of their original situation
Equity	Decisions should favour the most disadvantaged in order to secure a more equal outcome in the end

Regardless of the moral approach chosen, four mutually reinforcing dimensions of justice may be distinguished: *equitable distribution*, *full recognition*, *equal participation in decision procedures* and *equal capabilities*. In all of these, the extent to which justice is present can be assessed in terms of process and outcome. For example, equal participation without noticeable consequences in the resulting decisions and their outcomes may not be considered just.

The *distributional* dimension of justice is first and foremost about equity in the distribution of benefits, such as resources, opportunities and freedoms; as well as costs, risks and limits to freedom (Brighouse, 2004). Proponents of the *recognition* dimension of justice argue that we must also clarify the processes at the root of maldistribution, and ensure that social customs and generally accepted thinking does not normalise inequity. The *procedural* dimension of justice focuses on the political process of participation in problem framing, decision-making and outcome assessment. A fourth dimension of justice is that of *capabilities* proposed by Sen; this may be explained in practice by referring to a simple metaphor. There is no use in generously being offered a bicycle if we don't know how to cycle and therefore cannot choose to cycle. These dimensions of justice are mutually reinforcing; overlooking one compromises progress in the others.



The transition to sustainability and to a low carbon economy presents us with the challenge of addressing intergenerational issues, both historical and future, made increasingly explicit, for example, in climate change adaptation and mitigation debates. These challenges are also global, and confront international, national and local leaders across the world seeking to ensure that sustainable technological solutions, institutional settings and social practices promote fair processes and ultimately more equitable outcomes. As such, these are two cross-cutting dimensions of justice: space and time. Table 2 aims to characterise the six dimensions of justice. [Click to see the table in large format.](#)

	Equitable Distribution	Recognition (eg of needs and rights)	Equal Participation	Equal Capabilities (Proposed by Amartya Sen)
<b>Definition</b>	<b>Equity in the distribution of both goods (benefits) and 'bads' (costs)</b>  Idealised non-biased distribution behind "veil" - ignoring calculations of possible outcomes according to own strengths and weaknesses	<b>Psychological dimension</b> -freedom from physical threat; equal political rights; respect for one's culture  <b>Social status dimension</b> – respect; absence of cultural domination or socially accepted denigration	<b>Equal participation in a political process</b> required to address both unequal distribution and misrecognition  Underpinned by objective conditions: resources underpin an actor's <b>independent voice</b> and subjective conditions: cultural and social norms influence equal opportunity to hold <b>social esteem</b>	Equal opportunities to do and be what one chooses - <b>to fully 'function'</b> in a given society  Anything that precludes <b>choice of 'functionings'</b> is unjust
<b>Example</b>	Siblings pre-divide inheritance in lots of equal value; lot chosen through lucky draw seems fair to all	Manifests itself directly in relationships between individuals as well as in social norms influencing individual perceptions about what it is normal and accepted	Equal stakeholder participation leads to better natural resource conservation outcomes (E. Ostrom)  Lack of participation with large impacts on the livelihoods of rural communities, and to further marginalise those with lowest social status	If chosen, functioning is being able to access clean water, enough food and keeping warm  Then... respective capabilities to be distributed must include – access to water and food, adequate clothing and energy access
<b>Shortcoming</b>	<b>Does not address factors causing inequality</b>  <b>Idealised process</b> is impossible to put into practice in most decision-making processes.	Only fully achieved through changes in <b>social norms</b> that no one actor can control (collective effort needed)	Need to pay <b>attention to how representative and legitimate included stakeholders are</b> , and to power relations within communities. Cannot assume coherence of views and interests	Capabilities not listed  Individuals and communities need to list the functionings and capabilities of their choice <b>in their social and environmental context</b>
<b>Across time (inter-generational)</b>	Climate Justice and the inter-generational issue - <b>moral duties owed by the current generation to future people;</b>	<b>Recognising duties to protect at least the basic rights of children and those as yet unborn</b> to health and subsistence; and potentially their access to an equal quality of environmental system	Adequate involvement of all living generations, and full consideration of future generations' needs in decision processes	Adequate protection of environmental systems ensures capabilities of future generations
<b>Across space (intra-generational)</b>	Climate justice <b>at multiple spatial scales</b> (from the global to the urban), considering social vulnerabilities overlapping in space	Recognising how <b>stigmatisation of places</b> and stigmatisation of people can be inter-related	Participatory decision-making is in practice spatially and socially differentiated	Ensure that recognition and valuation of ecosystems services, contributes to the functionings of those living in and protecting those ecosystems (e.g CBD protocol on access and benefit sharing)

### 3. Political and institutional responses

Contemporaneous with the development of recent justice-based thinking, international organisations (most notably the United Nations and the OECD) have adopted frameworks that address issues of justice and sustainability. Foremost amongst these has been the Brundtland Commission whose 1987 paper *Our Common Future* introduced the commonly accepted definition of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (WCED, 1987, p.16). Bringing together the development and environmental agendas, it explicitly addresses the key justice issue of intergenerational equity as well as recognizing the basic needs of people (which economic development may facilitate).

The UN Global Compact, launched in 2000, claims to be the world’s largest corporate sustainability initiative. It represents “a call to companies to align strategies and operations with universal principles on human rights, labour, environment and anti-corruption, and take actions that advance societal goals” (UN Global Compact, 2016). Its ten principles are intended to form the basis of corporate action, with an emphasis on collaboration and innovation.

In September 2015 the UN adopted the '2030 Agenda for Sustainable Development, building on the Millennium Development Goals. Associated with this initiative are 17 Sustainable Development Goals and 169 targets (UN Department of Economic and Social Affairs, 2016).

Several of the goals are particularly relevant to justice in transition:

- Ensure access to affordable, reliable, sustainable and modern energy for all (Goal 7)
- Promote sustained, inclusive and sustainable economic growth, full and productive employment and decent work for all (Goal 8)
- Take urgent action to combat climate change and its impacts (Goal 13)
- Promote peaceful and inclusive societies for sustainable development, provide access to justice for all and build effective, accountable and inclusive institutions at all levels (Goal 16).

The landmark Paris Agreement resulting from the December 2015 Conference of the Parties (COP 21) forms the basis for a global deal to tackle climate change. The agreement focuses on controls on greenhouse gas emissions (and climate adaptation measures) but also makes clear the range of social and environmental concerns that must be accommodated alongside these actions. It emphasises “the intrinsic relationship that climate change actions, responses and impacts have with equitable access to sustainable development and eradication of poverty” (UNFCCC, 2015, p.20). It also notes the concept of climate justice and the need to take into account “the imperatives of a just transition of the workforce” (*Ibid.*).

Furthermore in an all-encompassing statement it indicates that Parties to the Agreement should “respect, promote and consider their respective obligations on human rights, the right to health, the rights of indigenous peoples, local communities, migrants, children, persons with disabilities and people in vulnerable situations and the right to development, as well as gender equality, empowerment of women and intergenerational equity” (*Ibid.*).

The Paris Agreement (in part) reflects the positions adopted by two distinct proponents of justice in low carbon transition: the international labour movement and the Mary Robinson Foundation.

The 2013 General Conference of the International Labour Organisation adopted a basic framework to address the challenges of a just transition recognising that inappropriate climate policies may result in unemployment. The framework accordingly proposed specific strategies in key areas:- macroeconomic policy, industrial and sectoral policies, enterprise policies, skills development, occupational safety and health, social protection, labour market policies, rights and labour standards. It aims to go beyond the greening of the economy and supports a deeper transition towards sustainable development and poverty eradication (ILO, 2013).

Several dimensions of justice are prominent in their approach: a fair distribution of benefits for all sections of society and across the globe; the recognition of rights and needs of workers and communities; the importance of an inclusive process of social dialogue; and the crucial role of education and training programmes to enhance capabilities.

The work of the Mary Robinson Foundation - Climate Justice is wide ranging with a particular focus on the poor and disadvantaged. Their objectives are to:- respect and protect human rights, support the right to development, share benefits and burdens equitably, ensure participation, transparency, and accountability in climate change decisions, highlight gender equality and equity, harness the power of education for climate stewardship and use effective partnerships to secure climate justice (Mary Robinson Foundation – Climate Justice, 2015). There is a sense of urgency here in giving poor and vulnerable communities a voice in the efforts to adapt and mitigate climate change, highlighting issues of participation and procedural justice.

As to the implementation of the Paris Agreement, it seems that this will be heavily supported by appropriate legal and judicial systems at the national level. Lawsuits are also being filed against states to increase their climate change commitments. In the Netherlands, the Urgenda Foundation and nine hundred co-plaintiffs brought the Dutch government to court for failing to take adequate climate action, and won the case in June 2015 (Urgenda Foundation, 2015). Similar court cases have been filed by citizens in Belgium and Norway against their governments (*Ibid.*).

This set of political and institutional responses is also providing a context in which business organisations, and global corporate actors, are called to act in a more self-conscious and responsible way.

## 4. Transition and innovation

Having explored the nature of justice and how this is reflected in the institutional and political landscape internationally, it is equally important to understand the nature of transition – the subject of multiple strands of academic literature.

A transition is commonly described as a set of co-evolving processes of fundamental change in social, technological and ecological systems. One strand of literature highlights how dominant ways of doing/producing/consuming come into being as a result of interaction between technological development, policy, science, culture and social practices (Geels, 2011). Progression to a low carbon economy should then be achieved through a combination of both incremental and radical *innovation* at multiple levels of institutional life (from small and medium-sized business organisations, to national economic sectors, to dominant transnational companies and international organisations).

The literature on innovation systems highlights the importance of going beyond technological innovation and considering the strategic significance of other types of innovation, namely organisational innovation, social innovation and institutional innovation (Lundvall, 2007; Swilling and Annecke, 2012). Table 3 presents key features of these innovation types as inferred from this literature.

Identifying these different types of organisational, social and institutional innovation may be helpful for decision-makers to recognise internal and external forces that should be considered in the design of innovation strategies. In a business context, Peter Drucker notes that sources of opportunity for innovation often lie outside a company, and may include industry and market changes, new knowledge or technology, demographic changes and changes in external perception (eg attitudes towards corporate responsibilities) (Drucker, 2013). Radical innovation will require businesses to be at the forefront, shaping opportunities for innovation in partnership with governmental and civil society actors. The power to disrupt must be accompanied by an additional sense of responsibility to contribute to the common good, and an enhanced capacity to assess one's impact and engage in periodic assessments that are open and well participated.

The success of some disruptive innovators, often small and medium size firms, is revealing the obsolete nature of some business models. For example, innovative energy businesses are going beyond energy supply into demand management. They are showing the disruptive potential of energy management services and how profit can be made from selling technological solutions that promote smart-grids and energy self-reliance. The business added value is thus to sell *less* energy, enabling users to meet their needs with less energy, and thus creating co-benefits for the natural environment and economic activity.

**Table 3. Beyond technological innovation**

Type of Innovation	Some of its key features
<b>Organisational innovation</b>	<ul style="list-style-type: none"> <li>- process-based innovations such as introducing sustainability in procurement policies, more efficient production (less raw material/less energy/less waste), product take-back processes (reverse supply chains);</li> <li>- more sophisticated environmental management systems (EMS) or integrated management systems, which are themselves required to manage process innovations;</li> <li>- greater involvement of a wider range of stakeholder groups (eg local authorities, community groups, non-governmental organisations), when assessing current and potential social and environmental impacts; the nature of problems and innovation priorities;</li> <li>- new ways of measuring and rewarding manager's success;</li> <li>- new business models (eg from car manufacturing to car sharing services; from energy supply to energy management services);</li> </ul>
<b>Social innovation</b>	<ul style="list-style-type: none"> <li>- public or private investment in businesses that deliver both economic development and social cohesion objectives;</li> <li>- relational innovation focusing on improved management of relationships between individuals and organisations as a way to enable social cohesion, solidarity, learning and benefit sharing.</li> </ul>
<b>Institutional innovation</b>	<ul style="list-style-type: none"> <li>- rules setting incentives or disincentives in a mutually reinforcing and coherent manner;</li> <li>- minimising transaction costs incurred when change takes place;</li> <li>- transparent distribution of benefits and costs;</li> <li>- clear definition of individual and collective responsibilities;</li> <li>- creation of opportunities for inclusive and deliberative processes of decision-making, with clear methods to demonstrate input into decision outcomes.</li> </ul>

In the study of innovation processes, businesses are sometimes portrayed as adopting one of two opposing strategies: a) as new market entrants/entrepreneurs bringing disruptive change and pushing the innovation agenda rapidly forward; b) as market incumbents suffering from a fixed asset 'lock-in' effect, and thus attempting to exploit the benefits of past investments through incremental improvements. This may be an unhelpful representation of reality. A partnership approach between market entrants, market incumbents, regulators and civil society may be possible and necessary for innovation that is geared towards sustainability and justice (Swilling and Annecke, 2012).

Incremental innovation capabilities of some policy and large corporate actors will be critical to scale disruptive innovation up. Recent research on low carbon pathways for the UK electricity system has highlighted the important role of policymakers in upscaling and advancing transition at a national or sectoral level (Foxon et al., 2010).



## 5. A 'Justice in Transition' Toolbox

In the context of the Sustainable Development Goals and in a post-Paris landscape, there are new demands on decision-makers and business organisations, requiring them to be explicit and progressive in the way they assess elements of social and environmental justice in their production, consumption, and innovation processes. Innovation agendas must be informed by a thorough and socially accepted understanding of problems. On this point, CISL's *Rewiring the Economy* identifies social innovation as one of the key task for businesses, recognising that in an appropriately guided economy, business can be an engine of sustainable development, not just economic growth, dealing with challenges such as poverty and climate change. In addition, the academic literature tends to argue that fundamental change will not come about without clear incentives from governmental actors, civil society actors, consumers and citizens.

The academic literature tends to put innovation (in its multiple guises) at the heart of a transition. This working paper argues that there is considerable value in embedding justice in innovation strategies. This may result in decisions that not only generate more social acceptance and 'buy-in' but are also likely to generate, from a business perspective, better knowledge of business opportunities and enhance long-term viability of investments in the context of high climate variability and social inequalities. Understanding different justice implications also enables participants in business decisions to unpick positive and negative social and environmental impacts in a way that would win greater trust of stakeholders and consumers. Ultimately, using a justice lens would support corporate innovation processes that meet societal demands for a low carbon and sustainable mode of human development.

Furthermore, framing corporate innovation (technological, organisational, social and institutional) around the idea of justice certainly would provide an 'igniting purpose', as described by Lynda Gratton (2007), in a way that supports effective innovation in businesses. A justice-oriented innovation agenda is likely to unite people from diverse backgrounds around issues that genuinely excite them.

A briefing by the International Institute of Environment and Development, in collaboration with CAFOD, noted key components of a green (ie low carbon) and just economy (Raworth et al., 2014). It is recommended that leaders in both policy and business circles:

- Generate a vision that is both green and just;
- Seek co-benefits and transformational change, but recognise that trade-offs between green and just objectives will arise. It is therefore crucial to identify who will be affected and ensure that the interests and well-being of the poor is enhanced;
- Remain aware of the bias and limits of economic methodologies and market instruments – which might for example undervalue social and environmental goods;
- Ensure policies are co-designed with participation, knowledge and practice of communities – promoting empowerment and gender and ethnicity aware policies;
- Understanding the geography of change including stranded assets, job losses, induced migration etc.;
- Supporting adaptive context specific flexible policies which can be adjusted as results become clear.

Within the business circles, a 'Shared Value approach' has started to receive greater attention (eg Nestle's shared value initiative). The approach aims to help large businesses to go beyond profit to integrate broader social and environmental needs (Porter and Kramer, 2011). A related review by Pfizer and colleagues (2013) identified the key elements of a successful Shared Value approach within organisations as follows:

- **Embedding a wider social purpose in the corporate culture**, and solving major social problems in a profitable way; this involves allocating resources to innovation that aims to solve social problems
- **Understanding the social problem**; understanding needs that should be addressed but also understanding the underlying causes of the social problem
- **Measuring social and business value** enabling outcomes to be monitored
- **Creating the optimal innovation structure**, considering options such as the creation of dedicated units or the financing of external entrepreneurs
- **Co-creating with external networks**, which entails deep engagement with stakeholders identifying problems, designing and implementing solutions.

The Shared Value approach appears to have characteristics that advance justice in the transition. However, in its aim of social value maximisation there may be echoes of utilitarianism. While the approach is participatory and inclusive, and thus may potentially contribute to enhance justice, it remains focused on enhancing the size of the ‘pie’ with less consideration on how to navigate trade-offs and address negative impacts proactively. Consideration of co-benefits from corporate action should be matched by the ability to identify and consider trade-offs and negative impacts in a more open and transparent manner. This would support a more just transition, as it would enhance aspects of justice as recognition and equal participation (or procedural justice).

The ‘Justice in Transition’ toolbox in table 4 integrates the points made in the IEED report and the literature on shared value. The toolbox aims to help decision-makers and business leaders in applying a justice lens to systematically assess impacts, trade-offs and needs, study alternative transition paths and decide on innovation strategies. It presents a matrix relating a spectrum of justice elements (numbered 1 to 6) with four types of innovation (identified by letters A to D). Each cell of this matrix describes a recommended action or strategy. [Click to see the table in large format.](#)

Elements of Justice	Core Co-evolving Innovation Processes promoting a transition			
	Technological Innovation (A)	Organisational Innovation (B)	Social Innovation (C)	Institutional Innovation (D)
<b>1. Equitable distribution</b>	Make a goal that technological changes serve the needs of all sectors of society, including the most disadvantaged.	Spark new notions of legitimacy, shared value and entrepreneurship.  Organisations (public or private), workers, shareholders and stakeholders receive a fair share of value created, and shoulder a fair share of costs incurred.	Make the development of relationships of trust a priority. Enhance collaborative capacity across organisations and sectors (profit and non-profit), while monitoring if the results of collaboration include a fair distribution of costs and benefits.	Structuring of fiscal and other policy incentives is coherent and guides the behaviour of economic actors towards fairer distribution of costs and benefits.
<b>2. Recognition</b>	Recognise and consider differentiated technological needs across communities and social groups (elders, women, low-income, the geographically isolated).	Encourage reflection about organisational culture, questioning social norms that have become normalised but may be at the root of inequitable outcomes	Acknowledge and address a variety of needs (for example, women, elders and various ethnic groups) as part of relational processes	Enhance the reflexive nature of organisations, considering the assumptions and rules embedded in decision-making models
<b>3. Equal participation</b>	Give all stakeholders a voice in technology-related investments.  Innovation decisions remain open, even to non-innovation and tweaking previously existing techniques and practices (eg reuse of domestic waste for biogas production).	Involve shareholders and stakeholders more closely in processes of decision making (including problem definition)  Foster open and inclusive evaluation of outcomes (eg: are product life cycles fair; are corporate sustainability targets adequate)	Actively engage with a variety of views in a non-hierarchical style  Promote organisational cultures that value individual differences, experiences and perspectives of the organisation and its role in society	Make rules that encourage open and inclusive innovation processes, reward involvement of external stakeholders, and incentivise cross-sectoral engagement
<b>4. Equal capabilities</b>	Provide all interested stakeholders with the opportunity to acquire skills to work with or make use of the new technology.	Engage collaboratively across public and private sectors to ensure that training and capacity building occurs according to needs and aspirations	Seek to empower by pro-actively understanding ambitions, skills needs, and learning-by-doing ways to enhance capabilities	Inclusive decision making about new skills training programmes and capacity building
<b>5. Justice across time</b>	Avoid technological pathways that involve large scale infrastructure that is very difficult to remove, thereby reducing costs for future generations, and social and environmental risk.	Adopt longer term objectives and broader views of what constitutes good performance including greenhouse gas emissions and social impacts	Assess project outcomes periodically, as a way of monitoring new needs and opportunities for new projects	Embed and prioritise duties and responsibilities for future generations
<b>6. Justice across space</b>	Consider how technology impacts directly on the natural environment and on how society interacts with it	Address justice across all locations and within the value chain, covering suppliers and customers	Integrate and recover stigmatised places and their communities affected by organisational action	Assess mismatches between general rules, and local needs and contexts  Build capacity to adapt general rules to local conditions

In the following sections we will consider three examples: a business example; a sectoral policy example; and a geographical example. While the first two examples will take elements of justice as starting point, and then explore how each one might be pursued in different innovation processes, the third examples takes one type of innovation as starting point and then explores how different elements of justice might be addressed. This demonstrates the different potential applications of this 'toolbox'.

The literature surveyed supports the argument that justice in transitions to a low carbon economy will only be possible on the basis of radically innovative processes of technology development, organisational management, social interaction and institutional interplay. Ultimately, the 'Justice in Transitions' toolbox may enable public and private sector leaders to design radical innovation processes that fully explore opportunities to create shared value and enhance social and environmental justice.

## 6. Applying the 'Justice in Transition' (JT) toolbox to a business organisation

We turn now to consider the comprehensiveness and quality of business innovation efforts, and to question how the six aspects of justice are being (or may be) considered in this context.

On the basis of the JT toolbox, a set of questions are put forward in this section to test how a concrete business initiative meets objectives associated with justice in the transition to a low carbon economy. The goal is to stimulate new strategic thinking and the emergence of alternative modes of operating that are more explicit about their contribution to justice in the processes and outcomes associated with the transition. Whenever possible, we will make reference to specific boxes from Table 4 (eg 1D will refer to equitable distribution issues in institutional innovation) in order to facilitate the reading of the examples given. In many cases, however, the examples given may engage with multiple boxes, which are best seen as deeply interdependent.

A fundamental step is to develop a new company or sectoral vision and purpose in a low (or neutral) carbon future, making justice considerations explicit. *Rewiring the Economy* identifies this as "setting a bold vision and innovating to deliver greater value", while noting that it can involve a degree of disruptive innovation that will be challenging for incumbent companies. A credible vision and transition strategy will require a clear approach to carbon reduction in owned operations. This would need to be consistent with global longer term low carbon objectives, while looking beyond the direct carbon footprint to consider areas where there is potential to add value and enhance various aspects of justice.

New visions and ambitions will need to integrate a thorough understanding of the lifecycle of existing products and services, and their impacts both on the natural environmental and on society. New practices will need to factor in tangible and intangible costs and benefits, and be assessed against a mix of quantitative and qualitative indicators. This leads into more operational issues of environmental assessments, reviews and management systems that may need to be taken up in processes of organisational innovation. Information derived from such management processes can then be fed into technological innovation processes.

The JT toolbox points to the need for business organisations to engage with external stakeholders in civil society and policy circles in a more systematic and transparent manner. Business organisations need therefore to become more open as they engage with alternative transition paths. This aligns with meeting societal demands for legitimacy and accountability in business and finance activities.

In view of the social challenges of employment in times of slow economic development, and the environmental problems associated with climate change, it is useful to develop a JT 'fitness test' to assess corporate strategies and actions. The test could include questions such as:

- Are business innovation strategies consistent with maintaining global temperature rise under 2°C?
- How inclusive are innovation processes? Is it clear how stakeholders have been involved?
- Are the capabilities of communities and individuals being enhanced?
- Do all staff and workers through the supply chain receive at least a living wage?
- Are a range of social and environmental indicators being used to monitor progress towards low carbon and just processes and outcomes?
- Are potential trade-offs identified and explicitly addressed?
- Have you articulated to your stakeholders how you contribute to delivering social and environmental outcomes? How are you demonstrating this?

These questions are expanded upon and developed in more depth in an example from the financial sector, to which we now turn. We make a simple attempt to translate the conceptual and analytical tools in Table 4 into one specific business context through the application of a JT 'fitness test'.

### 6.1. A case from the financial sector

A credible vision and transition strategy to carbon reduction in owned operations is behind the **RBS Innovation Gateway** - an initiative supporting eco-innovation and resource efficiency, particularly in energy, water and waste. It drives RBS's carbon reduction by engaging with innovative small and medium sized enterprises (SMEs) proposing to test new technological solutions, roll them out across the bank's estate (2,500 properties in the UK), and prepare them for widespread commercialisation. The bank recognises that current technology will only allow the attainment of 25 per cent of its carbon reduction targets. This initiative will try to achieve the additional 75 per cent (Idle, 2014).

The comprehensiveness of this innovation strategy, and therefore its capacity to induce durable and just transformation, may be evaluated in light of the JT toolbox. Considering the online information introducing this initiative, one may argue that organisational, social and institutional dimensions of innovation seem under-explored. In order to enact change that helps meet such a large share of the carbon reduction targets, RBS may need to step up its ambition to transform itself and the way in which the organisation is managed. Important issues in organisational innovation may include the way in which RBS assesses investment opportunities worldwide, or in the way that the performance of its managers and service suppliers is monitored and rewarded.

Furthermore, if innovation strategies do not factor in social practices and institutional constraints surrounding the use and wider adoption of innovative technologies, there is a high risk of failure or superficial, localised change. There may be, for example, a shortage of skilled workers necessary to apply the new technology to the entire estate, and this shortage may be related to problems in professional training organisations nationwide. These may be under-resourced in certain parts of the country, which would point to even deeper institutional constraints. A broader innovation strategy, mapping out potentially important alliances with civil society and policy actors is advisable.

In the same way, it would be important that social implications are also fully explored as the SMEs' innovative products are rolled out to the entire estate and then commercialised. Implications might include social habits driving or constraining the use of the technology and its diffusion beyond the RBS estate. Socially embedded beliefs and behavioural norms could be addressed with civil society actors, in conjunction with a campaign to promote public awareness, distinguish facts from belief, and clarify levels of uncertainty and risk.

These considerations highlight the need to coordinate technological and organisational innovation

processes, with aspects of social and institutional innovation that may require more time before their outcomes can be quantified. Certain aspects of organisational innovation may also need to be in place, such as the introduction of new indicators that monitor management performance in different ways (both quantitative and qualitative) over various time spans. Ideally, such innovative practices will mean business executives make themselves fully aware of longer term opportunities and risks on the way to greater resource efficiency.

With regard to the six elements of justice across the various types of innovation, the RBS Innovation Gateway, as a technology-based initiative, may contribute to distributional equity, firstly because it targets small and medium sized companies that would otherwise find it difficult to prove the value of their technological solutions. It can therefore provide a route for disruptive innovators to break through and earn an important market share. In this sense, it represents a partnership between incumbent and disruptive actors that can enhance job security and cut carbon emissions in a service sector. Still, there seems to be insufficient information about selection processes and the potential of selected technologies to benefit the entire service sector and ultimately society as a whole.

The JT toolbox opens up these and other questions going beyond the distribution of costs and benefits derived from technological innovation. These are set out in Table 5.

Justice dimension	Table 5 - Questions about the RBS Innovation Gateway sparked by a 'JT fitness test'
<b>Distributional equity</b>	<ul style="list-style-type: none"> <li>• Do all staff and workers through the supply base receive at least a living wage? Are managers assessed according to their contribution to social and environmental outcomes, in addition to financial targets? How would services offered to the poorer sections of society be enhanced? (box 1B in Table 4)</li> <li>• Does the technology enable collaborative modes of work and the development of trust-based relationships across individuals and organisations? (box 1C)</li> <li>• Is there an institutional innovation strategy supporting other types of innovation with the underlying objective of advancing a fair distribution of costs and benefits? For instance, how does the innovation strategy promote a fair distribution of earnings between tax and profit? (box 1D)</li> </ul>
<b>Recognition</b>	<ul style="list-style-type: none"> <li>• Will people with disabilities be able to easily use the technology if and when it needs to be handled? (box 2A)</li> <li>• Do employees and clients with larger family duties (eg caring for multiple children, elder or disabled individuals) need specific help to access or use new technology? (box 2B)</li> <li>• Are the needs of children, elderly and the disabled considered in social and institutional innovation initiatives? (boxes 2C and 2D)</li> </ul>
<b>Procedural issues (equal participation)</b>	<ul style="list-style-type: none"> <li>• Are stakeholders voicing their needs before decisions to roll out a technology are made? How transparent are decisions? Are the potential trade-offs identified and explicitly considered when evaluating alternatives? (box 3A)</li> <li>• How are users and other stakeholders involved in decision-making on organisational innovation? (box 3B)</li> <li>• Is the set of social and environmental indicators used adequate to monitor progress towards low carbon and just processes and outcomes? (boxes 3B and 3C)</li> <li>• Is there consistency across different policies and rules concerned with</li> </ul>



	participation of stakeholders and the wider public? (box 3D)
<b>Equal Capabilities</b>	<ul style="list-style-type: none"> <li>• Are new skills and training available for users or for those working in the industry installing and maintaining the new technologies? (box 4A)</li> <li>• Is the organisation planning to engage with their employees, civil society actors, other business organisations and government entities in favour of new strategies, programmes and activities that enhance capabilities of workers and communities? (boxes 4B and 4C)</li> <li>• Are rules (ie institutional structures) enabling and incentivising such strategies, programmes and activities? (boxes 4D)</li> </ul>
<b>Justice across time</b>	<ul style="list-style-type: none"> <li>• Will the technology be easy to repair or will it require expensive maintenance in the medium to long term? Does it use materials that are easy to recycle or re-use? Does it contain polluting substances? Will it make a significant contribution to carbon reduction and to keep temperature rise below 2 degrees? (box 5A)</li> <li>• Is the organisation setting long term objectives and reflecting periodically on the best indicators of management for social and environmental justice? (box 5B)</li> <li>• Are social innovation initiatives involving the younger generations, monitoring their needs and project outcomes in a satisfactory way? (box 5C)</li> <li>• Are decision-making processes (and the rules governing them) able to consider the interest of unborn individuals? Do they protect the freedom of future generations and their ability to live their lives fully in the natural environment of Planet Earth? (box 5D)</li> </ul>
<b>Justice across space</b>	<ul style="list-style-type: none"> <li>• How would the environmental impacts of a specific innovation be assessed? (box 6A)</li> <li>• Within the organisation, and considering the transnational reach of many financing decisions, how would the interests of stakeholders in other countries be included in decision-making, particularly the interests of the poor? (box 6B)</li> <li>• How would communities in stigmatized regions and places (eg those near landfills) benefit from innovative financing solutions? (box 6C)</li> <li>• How would the specific technological needs of services in rural versus urban areas be considered? (box 6D)</li> </ul>

These set of questions (and others possibly more directly linked to real-life situations) may help decision makers to run open and well participated decision-making processes, and reflect on longer term opportunities and risks. In the case of the RBS Innovation Gateway these lines of enquiry may help select new technologies for experimentation in RBS estate or to finance for wider dissemination in the energy, water and waste sector worldwide. Ultimately, a decision process supported by the toolbox would allow RBS to make a solid case to the bank's various private and public audiences regarding their contribution to justice in the transition to low carbon and sustainable development.

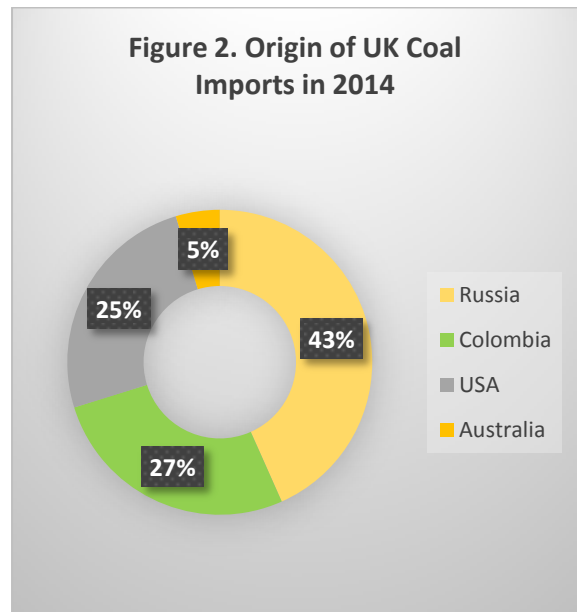
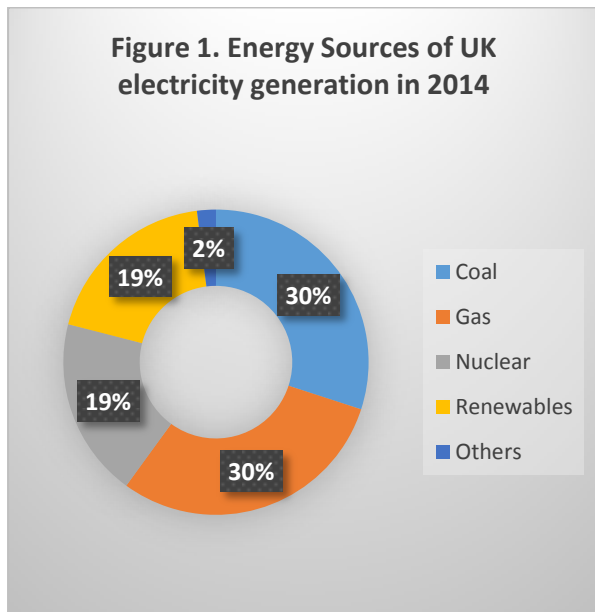
## 7. The case of the UK's energy sector

The energy sector of the UK is the second case we apply the JT toolbox to. The transition to a low carbon economy involves the substitution of fossil fuel energy with other energy sources, primarily renewable energy such as solar, wind, biogas and others. While the need for this transition is

increasingly acknowledged, how it should take place, and at what speed, are questions of political choice as well as social and environmental justice. This is an argument often put forward by the ILO and the Mary Robinson Climate Justice Foundation. In the next sub-section, we present an overview of the UK’s energy sector, and some of the key obstacles that the transition seems to be facing according to academic literature, grey literature and press. On the basis of the framework in Table 4, we pose specific questions and raise issues to be addressed if we, as decision-makers, citizens and/or consumers, want to bring about a ‘just transition’. We build on the assumption that at the heart of the transition to a low carbon economy, there should be a closely interconnected set of technological, organisational, social and institutional innovation processes. We explore, therefore, what it means to systematically consider the multiple dimensions of justice in all four aspects of innovation, giving particular attention to crafting a fair transition away from coal energy sources.

### 7.1 Overview of the UK’s energy sector and its transition trajectory

The use of fossil fuel in the UK is decreasing, but remains an essential part of the energy mix. There is a significant reduction in the size of the UK’s coal mining industry and in the offshore oil and gas industry. The last of the UK’s deep coal mines was closed in 2015 while the offshore oil and gas industry has been in decline since 1999 when North Sea oil production peaked. Since then it has fallen at approximately 7 per cent per year (BBC, 2014). In spite of this, coal and gas remain very important in the UK energy mix, as Figure 1 reveals. Coal-fired power stations produced about 30 per cent of UK electricity in 2014, approximately the same proportion of electricity derived from natural gas. The electricity derived from renewable energy represented 19 per cent. Based on 2014 statistics provided by the Department of Energy and Climate Change set out in Figure 2, Russia was the biggest source of coal imports, and provided about 40 per cent of the coal used for UK electricity generation (DECC, 2015). Coal mining communities question the legitimacy of closing the UK’s mines when coal is clearly still required to meet national energy needs. Moreover, price signals to producers mean that UK coal is not being substituted by renewable energy but by cheaper coal sources from elsewhere in the world.



Nonetheless, the production of renewable energy has been on the rise. In 2009, the UK had more offshore installed wind capacity than any other country, including Denmark (GWEC, 2009). According to a government strategic environmental assessment published in 2009, the UK’s offshore capacity

could provide a quarter of the country's electricity needs, and generate 70,000 jobs (Press Association, 2009). It has been argued that the offshore renewable energy industry requires further financial assistance during the early stages of its development (Esteban et al., 2010), particularly because it has to compete with subsidised fossil fuel energy sectors. In 2009, coal power was the cheapest, costing US\$0.05 per Kwh. Offshore wind power cost approximately US\$0.11 per Kwh (*Ibid.*).

One of the main obstacles to the transition is institutional, and concerns the enduring government support to fossil fuel energy producers and consumers, and consumer support for fossil fuel. The OECD 2013 Inventory of Estimated Budgetary Support and Tax Expenditures for Fossil Fuels summarises the UK government support given to producers in the form of tax breaks and to consumers in the form of lower VAT (5 per cent instead of 20 per cent). According to the OECD, tax breaks to oil and gas producers amounted to £280 million in 2011 (the latest year for which data is available). Producer support for coal was phased out and has been unavailable since 2009.

Government support to consumers in the form of reduced VAT applies to all energy prices, including renewable energy. In terms of consumer support for fossil fuel consumption in 2011, this was highest for natural gas, totalling £3.5 billion, compared to £380 million for oil and £81 million for coal. While a low VAT can help the poor to access (more affordable) energy, there remains a need for innovative approaches to incentivise those currently using larger amounts of fossil fuel-based electricity to reduce their consumption.

It is current government policy to remove the green levy component of energy prices, on the basis that this is necessary to keep energy prices to the consumer at an acceptable level. The green levies, which constitute about 8 per cent of a dual fuel bill, support multiple schemes addressing environmental and social issues. The Energy Company Obligation (ECO) is the largest of the green levies and is partly used to support vulnerable households. Other measures recently adopted by the UK government include the removal of a climate change levy exemption for generators of renewable energy electricity, the ending of subsidies for onshore wind farms, support for fracking projects under natural parks and fiscal stimulus for North Sea oil exploration. This set of measures arguably reinforces the UK's carbon intensive path.

At the same time, while steps are taken away from UK coal-sourced energy, there is lack of support for communities reliant on coal production for their livelihoods, and living in fear of mass unemployment. The UK's last deep coal mine, the Kellingley colliery in North Yorkshire, was closed in December 2015, amidst public demonstrations of serious concern for the welfare and livelihoods of local communities (Press Association, 2015). A report from the OECD (2012) notes that UK coal-mining industry reform was initially imposed with little adjustment assistance, leading to problems of high unemployment and poor health in the affected regions. In 2000, the UK government initiated some financial support to assist these regions, targeting the creation of employment opportunities in disadvantaged areas, and created an enabling environment for the development of alternative business opportunities. This support has, however, not been sustained (OECD, 2012). There seems to be a lack of vision and leadership supporting sector-wide solutions to problems such as the retraining of former coal workers.

A just and therefore successful transition to low carbon may require the reskilling of the energy industry workforce in general, providing workers with appropriate qualifications and skills to manufacture, install, and operate low carbon technologies for example. The skills-related constraints identified by Jagger and colleagues (2013) need to be addressed. These constraints, resulting both from market and policy failure, include:

- a) **High risk and uncertainty associated with a given technology** hampers investment in the skills associated with these technologies.

- b) **Novelty in the technology** – low carbon technologies use either new combinations of existing skills or entirely new skills. Such skills are usually not readily available and it is difficult to find trainers, particularly when on-the-job training patterns are often preferred.
- c) **Issues of scale** become problematic when new large national projects are underway. New skills are in demand, without certainty of future further use. Having many smaller scale projects is considered more effective to overcome skills constraints. They may also enable more rapid learning-by-doing.
- d) **Inertia and path-dependence** take hold as sectors and stakeholders are committed to existing processes and practices, which arguably offer increased returns on previous investments. For example, relatively carbon-intensive cycle gas turbines (CCGTs) are relatively standardised and simple to build, with known costs over a relatively short lifespan. This makes them more attractive than low carbon technologies with uncertain costs and financial performance.

Policy responses used to reduce uncertainty in low carbon investments may influence the provision or acquisition of low carbon skills. In the UK, these policy responses include: the Climate Change Act (2008) and the independent advisory Committee on Climate Change; legally binding emission reduction targets and five-yearly carbon budgets, leading to an 80 per cent reduction in UK GHG emissions by 2050; a Renewable Obligation for large-scale renewable generation; long-term feed-in tariffs for small-scale renewable generation; a renewable heat incentive; and a floor price for carbon introduced in 2013 (Jagger et al., 2013). These initiatives are, however, not considered to enable the sector to overcome the above mentioned skills constraints (Jagger et al., 2013).

Skills shortages are still likely to occur, inducing greater costs, delays, reduced competitiveness, reduced employment, and greater uncertainty. Research has highlighted the lack of a skill acquisition strategy and that the skills needs of low carbon industry are not being adequately articulated, partly as a result of uncertainty caused by changes in government energy policy. The same research argues that the development of a cross-sectoral low carbon skills strategy, involving different government departments and different levels of government, will be fundamental for the success of the transition (Jagger et al., 2013).

Other research has highlighted institutional obstacles to low carbon innovation in the UK's manufacturing sector from the point of view of SMEs (Uyarra et al., 2016). It concludes that a loss of regional institutional support for entrepreneurship, along with lack of policy coherence, is affecting innovation processes in SMEs. Recently there was an important shift in the governance of regional policy, with the management of innovation being transferred back to the national level, and some limited economic development power being reassigned to the local level, particularly in England. It was the firms' perception that this change has resulted in "a largely centrally-controlled mix of policies supporting low carbon industry innovation with weak capabilities to coordinate" (Uyarra et al., 2016, p.264). Others concur that the abolition of regional governance structures in England is resulting in 'place-blind' innovation and industrial policies (Peck et al., 2013) as they are not being adjusted to local and regional conditions. It is argued that the absence of regional institutions is also leading to a more incoherent support system, and to poorer levels of uptake of the funding available by SMEs (Uyarra et al., 2016).

The findings above illustrate the importance of articulating multiple types of innovation, in this case technological innovation (eg renewable energy technology), organisational innovation (eg how government organisations and SMEs manage processes of diffusion of technological innovation and associated skill needs); and institutional innovation (eg decision-making rules and collaboration practices) in examining a transition trajectory. The example put forward by Jagger et al. (2013) shows how uncertainty around technological performance poses obstacles to organisational and institutional innovation. These obstacles make it less likely that the performance of innovative

technology will improve at the required speed. Clearly, technological innovation will not come about, and certainly not at scale, without organisational, social and institutional innovation. The interdependencies between innovation types mean that they need to be pursued together. The role of government, and of governance initiatives with businesses in this respect, seems central.

## 7.2 The transition of the UK’s energy sector from a justice perspective

How can one systematically assess the evolution of the UK’s energy sector using the lens of justice? And how could sectoral policy and energy-related businesses reliant on coal make progress towards a low carbon economy in a more just manner? This sub-section will explore each of the six justice elements in the four types of innovation. The six tables shown here refer to parcels of Table 4. that are gradually explored in a more applied way.

**From a perspective of equitable distribution,** and with reference to issues of *technological* innovation, national commitments made in Paris in 2015 demand the development, diffusion and upscaling of technological solutions that support a sustained and ambitious expansion of renewable energy production. This is what is required if human society is to avert dangerous, irreversible climatic change for the planet. In order to ensure that this expansion, and the technological innovation processes underpinning it are fair, decision makers and technology developers should consider the distributional factors constraining the most disadvantaged and vulnerable communities and their access to technology. Initiatives that actively promote access will promote a more equitable distribution of the costs and benefits of the anticipated transition.

Table 4.1 Issues of equitable distribution in the transition to a low carbon economy				
Elements of Justice	Core co-evolving processes promoting the transition			
	Technological Innovation (A)	Organisational Innovation (B)	Social Innovation (C)	Institutional Innovation (D)
<b>1. Equitable Distribution</b>	Make a goal that technological changes serve the needs of all sectors of society, including the most disadvantaged.	Spark new notions of legitimacy, shared value and entrepreneurship.  Organisations (public or private), workers, shareholders and stakeholders receive a fair share of value created, and shoulder a fair share of costs incurred.	Make the development of relationships of trust a priority. Enhance collaborative capacity across organisations and sectors (profit and non-profit), while monitoring if the results of collaboration include a fair distribution of costs and benefits.	Structuring of fiscal and other policy incentives is coherent and guides the behaviour of economic actors towards fairer distribution of costs and benefits.

On the *organisational* innovation front, employing a distributive justice lens entails re-assessing, for instance, whether shareholders and stakeholders receive a fair share of the value created by the organisation, and shoulder a fair proportion of the costs associated with its operation. The operationalisation of business models based on the creation of shared value promises to give greater social legitimacy to the operations of UK energy corporates.

*Social* innovation in the UK’s energy sector might involve the development of new collaborative working modes that gain and maintain trust within business organisations and between public sector, private sector and civil society organisations. Enhanced communication flows will influence how distributional justice problems are understood and tackled. One concrete social problem that could be addressed further in this way is fuel poverty. A report from the UK Association for the



Conservation of Energy about families and fuel poverty, revealed that 1.6 million children living in 930,000 families were in fuel poverty in 2013, representing an increase of 8.8 per cent in relation to 2010 (UKACE, 2013).

As far as *institutional* innovation is concerned, this overview of the UK energy sector indicates that there are old and new institutional obstacles to address if a low carbon transition is to be embraced and its fairness fully considered. The system of government subsidies and taxation is not providing incentives for the expansion of renewable energy to a level where it can compete with fossil fuels. Local social problems associated with the closing of coal plants are not being adequately addressed through on-going programmes of economic diversification and worker reskilling. Retraining communities and making renewables competitive requires a step change in policy approach and business practices. There are clear and very large environmental risks at global scales, but addressing them with no consideration to community livelihoods is not only unjust, it will also work against the objectives of a low carbon transition.

Addressing the distributional justice challenge will require new policy mechanisms that ensure coherence between energy policy, fiscal policy, social policy and education policy in order to address and monitor the vulnerabilities of disadvantaged groups to the effects of a low carbon transition in the job market. Policy coherence should also work to ensure that the vulnerabilities of disadvantaged groups to the impacts of climate change (eg more frequent extreme weather events) are fully addressed. Having communities negatively impacted by job loss also disproportionately suffer from more frequent flooding, for example, would be to allow injustice to multiply itself.

**When considering recognition aspects of justice**, processes of technological innovation to enhance low carbon energy production and access in the UK need to take account of the differentiated needs of the poor, the elderly, the disabled, and other disadvantaged groups. This is to avoid exacerbating the discrimination or disadvantage that may underpin other forms of energy injustice.

**Table 4.2**  
Elements of justice as recognition in the transition to a low carbon economy

Core co-evolving processes promoting the transition

Elements of Justice	Technological Innovation (A)	Organisational Innovation (B)	Social Innovation (C)	Institutional Innovation (D)
<b>2. Recognition</b>	Recognise and consider differentiated technological needs across communities and social groups (elders, women, low-income, the geographically isolated).	Encourage reflection about organisational culture, questioning social norms that have become normalised but may be at the root of unequitable outcomes	Acknowledge and address a variety of needs (for example, women, elders and various ethnic groups) as part of relational processes	Enhance the reflexive nature of organisations, considering the assumptions and rules embedded in decision-making models

During processes of organisational innovation, decision-makers should reflect upon aspects of organisational culture that may be impeding greater participation in the way that the decisions are made, and hampering fairer processes and outcomes when it comes to low carbon energy access and affordability. Careful consideration of the needs of the poor, children, the elderly and disabled will be particularly expected in processes of social innovation in the energy sector.

Institutional innovation will need to encourage reflexivity and incentivise leaders and managers to understand and question the assumptions embedded, for example, in the economic models

supporting decisions on energy infrastructure investment. These models may constitute a form of unquestioned social norm reinforcing unequal outcomes.

**Issues of procedural justice and equal participation** could also be more routinely raised. Relevant stakeholders should be heard when deciding what technological development is required. They could help steer infrastructural changes to enable the expansion of renewable energy production in a way that is socially inclusive, and adapted to local conditions. Equal participation of relevant stakeholders should mean that they have a say in the framing of problems to be solved, and take part in assessing the effectiveness and fairness of solutions as they are implemented – an organisational innovation. When considering issues of procedural justice in social innovation, the aim, for example, of improving energy access to disadvantaged communities could be pursued through an inclusive, non-hierarchical style of decision-making.

**Table 4.3**  
Justice as equal participation in the transition to a low carbon economy

Elements of Justice	Core co-evolving processes promoting the transition			
	Technological Innovation (A)	Organisational Innovation (B)	Social Innovation (C)	Institutional Innovation (D)
<b>3. Equal participation</b>	<p>Give all stakeholders a voice in technology-related investments.</p> <p>Innovation decisions remain open, even to non-innovation and tweaking previously existing techniques and practices (eg reuse of domestic waste for biogas production).</p>	<p>Involve shareholders and stakeholders more closely in processes of decision making (including problem definition)</p> <p>Foster open and inclusive evaluation of outcomes (eg: are product life cycles fair; are corporate sustainability targets adequate)</p>	<p>Actively engage with a variety of views in a non-hierarchical style</p> <p>Promote organisational cultures that value individual differences, experiences and perspectives of the organisation and its role in society</p>	<p>Make rules that encourage open and inclusive innovation processes, reward involvement of external stakeholders, and incentivise cross-sectoral engagement</p>

Institutional innovation that is procedurally just presupposes open and inclusive decision processes, and rules that incentivise decision-makers to involve external stakeholders and to engage in cross-sectoral collaboration. It seems that UK leaders in government entities and business organisations involved in energy innovation will need to devise new rules of collaboration that enhance renewable energy production.

Turning to issues of **equal capabilities**, and analysing this aspect of justice in technological innovation processes, the enquiry focuses on whether relevant stakeholders are provided with adequate opportunities to learn how to operate the technology if they choose to. In this context, the training of both a low skilled and highly skilled workforce would be a crucial step toward more just outcomes, and the provision of a work pool for potential employers. In relation to UK's coal mining communities, community support programmes (financed by the public or private sector or both) need to be in place and sustained to ensure that communities have alternative sources of livelihoods.

**Table 4.4**  
Justice as equal capabilities in the transition to a low carbon economy

Elements of Justice	Core co-evolving processes promoting the transition			
	Technological Innovation (A)	Organisational Innovation (B)	Social Innovation (C)	Institutional Innovation (D)
<b>4. Equal capabilities</b>	Provide all interested stakeholders with the opportunity to acquire skills to work with or make use of the new technology.	Engage collaboratively across public and private sectors to ensure that training and capacity building occurs according to needs and aspirations	Seek to empower by proactively understanding ambitions, skills needs, and learning-by-doing ways to enhance capabilities	Inclusive decision making about new skills training programmes and capacity building

If assessing organisational innovation from the perspective of equal capabilities, an organisation should create adequate opportunities for training and capacity building, not only for employees but also members of the community whose livelihoods may also indirectly depend on the business. The choice of training to be made available and its timing may be crucial for a fair outcome in job security.

**The justice dimensions of time and space** are often intimately related, as noted when considering choices of energy production infrastructure. Energy transition paths that demand large scale infrastructure will leave a legacy of high fixed costs for future generations, and entail greater environmental risks. It is more likely that a diversified energy production system that is built along a range of scales (from individual home and business systems, to community sized and large regional and national systems) will deliver wider and more reliable energy access.

**Table 4.5**  
Elements of justice across time in the transition to a low carbon economy

Elements of Justice	Core co-evolving processes promoting the transition			
	Technological Innovation (A)	Organisational Innovation (B)	Social Innovation (C)	Institutional Innovation (D)
<b>5. Justice across time</b>	Avoid technological pathways that involve large scale infrastructure that is very difficult to remove, thereby reducing costs for future generations, and social and environmental risk.	Adopt longer term objectives and broader views of what constitutes good performance including greenhouse gas emissions and social impacts	Assess project outcomes periodically, as a way of monitoring new needs and opportunities for new projects	Embed and prioritise duties and responsibilities for future generations

When assessing organisational innovation in UK's energy sector from the view point of temporal justice, important questions include: how can the organisational capacity to assess costs and benefits over longer time frames be enhanced; and how can the interest of future generations be protected in current political decision processes? The demands of climate change adaptation and mitigation apply additional pressure for organisational innovations that enhance capacity and broaden the horizon of decisions. Short term costs of a certain energy path may be unpopular but may be needed if large long term benefits are to be reaped. Organisational innovation that is temporally just involves a revision of what constitutes good management, and, accordingly, what performance indicators need to be used.

In the context of social innovation, justice across time could be enhanced through, for example, periodic evaluation of initiatives under implementation. The definition of assessment cycles could help understand effectiveness and identify new social needs that are also business opportunities. A spatially just social innovation programme would, for example, explicitly seek to involve and include communities living in places stigmatised, for instance, by nuclear waste disposal.

As to the pursuit of temporal justice in institutional innovation, new rules should reinforce the responsibility and the duty of caring for future generations, starting, for example, by accepting the duties of caring for the children facing fuel poverty in the UK today.

Thinking further in terms of distributive justice across space, the impacts of different technological alternatives upon the natural environment and ecological systems (themselves underpinning human livelihoods) will need to be carefully and periodically assessed. In relation to the UK's energy sector, this raises, for example, the question of what crops are being used for first-generation biofuel production, and what the implications are for human society and ecological systems, not only where those crops are grown but also elsewhere in the globe given the impact on food prices and access to agricultural land.

**Table 4.6**  
Justice across space in the transition to a low carbon economy

Elements of Justice	Core co-evolving processes promoting the transition			
	Technological Innovation (A)	Organisational Innovation (B)	Social Innovation (C)	Institutional Innovation (D)
<b>6. Justice across space</b>	Consider how technology impacts directly on the natural environment and on how society interacts with it	Address justice across all locations and within the value chain, covering suppliers and customers	Integrate and recover stigmatised places and their communities affected by organisational action	Assess mismatches between general rules, and local needs and contexts  Build capacity to adapt general rules to local conditions

Organisational innovation should also consider justice across space. In the case of the UK's energy sector, this may relate to the interests of communities and ecological systems in coal mining regions, both in the UK and abroad. Given the increasingly global nature of business supply chains, further information should be available about the immediate and long term impacts of coal production in the regions supplying the UK (eg Russia, Colombia, and areas of Australia where aboriginal communities are key stakeholders), in relation to both local communities and their environmental systems.

As to issues of spatial justice in innovative institutional arrangements, these should promote a deeper understanding of how national and international rules are adapted to local contexts, realities and needs. They should empower local communities, businesses and governmental actors to implement sectoral policy and legislation according to local social, economic and ecological conditions. This is already done, for example, in the implementation of European water legislation as applied to UK rivers and coasts. At the same, the participation of national actors may be necessary to guarantee equity across regions and to try to ensure that the actions of one region do not have a detrimental effect on other regions.

## 8. Applying the 'Justice in Transitions' Toolbox to a South African province

This section looks into a geographical application of the 'Justice in Transitions' toolbox, in South Africa. It assesses how a justice lens can deepen current understandings of threats and opportunities in the transformation from a carbon intensive economy to a low carbon economy in the region.

For the purposes of this "thought experiment", national data and information will be used, but the discussion centres on an imaginary province: one that is rich in mineral assets and harbours a diverse agricultural sector comprised of both large export-driven agricultural businesses and small holders dependant on subsistence agriculture. Coal mining and intensive irrigation are treated as important economic drivers in the province.

### 8.1 The case study province and its political economy

Coal provides more than 70 per cent of South Africa's primary energy, and generates over 90 per cent of electricity (Swilling and Annecke, 2012; Baker et al. 2015). The state-owned utility ESKOM has a monopoly over electricity generation and is the sole manager of the national grid, however the country's municipalities control 40 per cent of electricity distribution. ESKOM has been historically dependent on a combination of low-cost coal supplies and cheap labour, which has greatly benefited the mining and minerals-based export oriented industry consuming about 40 per cent of the country's electricity. However, cheaper sources of coal are now depleted and ESKOM costs are rising. In 2015, the company was downgraded by international investors to 'junk' status (Baker et al., 2015).

Mining is highly energy intensive and induces serious environmental degradation, particularly through water pollution and the discharge of toxic metals and acid mine drainage. South Africa is a dry country where 98 per cent of water resources are already allocated. There remains no "dilution capacity" to absorb effluents in river systems. In spite of this, the water resources protection legislation does not apply to the mining sector. There is as yet no policy to force mining to manage its wastewater, and this has very large costs for local agriculture and ecological systems (Swilling and Annecke, 2012).

National statistics reveal that 51 per cent of households experience hunger and 28 per cent are at risk of hunger (Swilling and Annecke, 2012). Energy prices and price volatility are adding to the struggle of the poor to make a living. The cheapest and most reliable source of energy remains coal. Even where electricity is available, its price remains too expensive and households tend to continue using coal for heating and cooking, with serious public health consequences (Mdluli and Vogel, 2010).

There are high levels of unemployment. In 2014, the unemployment rate was officially 25 per cent. This figure however excludes the 12 per cent of 'discouraged job-seekers', ie those who have been unable to find work in their area that matched their skills or have lost hope of finding any kind of work. To be classified as unemployed, one needs to have been actively looking for work in the past 4 weeks (AfricaCheck, 2016). In 2014, 54 per cent of black South Africans lived in poverty (StatsSA, 2014 in Baker et al., 2015).

In the province in question, we assume that deprivation is higher than average. Environmental degradation, high dependency on fossil fuels and marginalisation of small farmers are exacerbating food insecurity. Mining provides a third of the jobs with the majority of the remaining workforce being small-hold farmers, struggling to meet their energy, food and water needs. Meeting these needs in a low carbon economy will rely on approaches that value social well-being, and the ecological health that underpins it, beyond simple monetary valuations.



## 8.2 Current transition path in the national context

In terms of climate policy, South Africa is under increasing international pressure to reduce its carbon emissions. In 2009, President Zuma pledged to reduce carbon emissions by 34 per cent by 2020 and 42 per cent by 2025 below a business-as-usual trajectory. This pledge has now been formalised in the international climate change regimes through South Africa's Intended Nationally Determined Contribution (INDC).

The literature reviewed above does not however point to a low carbon development trajectory in South Africa. As noted in recent research, the decarbonisation of the electricity generation sector cannot be achieved without reducing the absolute contribution of coal-fired power (Baker et al., 2015). The same study argues that new investment in renewables will not suffice. It has also been emphasized that decarbonisation has to involve the adaptation and restructuring of network infrastructures, as well as changes in the institutions, markets and policy frameworks which are seen to be supporting a carbon-intensive system of production and consumption. There is uncertainty about the ability of ESKOM and the country's municipalities to accommodate and integrate new forms of renewable energy generation in the transmission grid (ibid.). There seems to be a strong political and economic dependency on coal that continues to 'lock' the country into high-carbon development. This is compounded by the fact that those pursuing low carbon development have little or no voice in decision-making processes.

Nevertheless, there is hope that in time the crisis in the country's coal-based electricity sector will translate itself into an opportunity to increase the contribution of renewable energy to the national power supply (Baker et al., 2015). New initiatives are focusing on developing new low carbon energy options such as wind, solar photovoltaics, and concentrated solar power as well as the rapidly developing technologies for energy storage. A programme for the procurement of renewable energy from independent power producers (the Renewable Energy Independent Power Producers' Programme, or REIPPP) was successfully set up in 2011. By September 2015, the programme was generating 2 per cent of total electricity in South Africa (Baker et al., 2015). In the last few years, and mainly as a result of significant private investment, a dramatic decrease in the cost of wind and solar PV energy has occurred and the prices of renewable energy have become cost-competitive with Eskom's new build coal-power plants (ibid.).

Still, if a significant change into renewables is to be politically embraced, serious consideration must be given to the challenges it may entail, particularly over the short and medium terms. Even though the current high carbon development path is seen as driving economic inequalities, low carbon alternatives must provide assurance that current asymmetries will not be reinforced or that new inequalities will not emerge.

For instance, how can renewable energy compete with the ease of access provided by coal or coal-based electricity for a poor household? Research into the political economy of decarbonisation sees opportunity in the progressive REIPPP programme and its expansion. However, questions remain about whether the programme is being implemented in a way that promotes socio-economic well-being as well as transparent, democratic policy processes (Baker et al., 2015). The authors note that while new REIPPP programme is expanding, it is not benefiting South Africa's poor and marginalised who are unable to buy their own rooftop solar PV. Their needs are not being addressed either by the increasingly expensive national grid electricity or by the costly renewable energy infrastructure.

Moreover, there may also be a high social risk associated with a fast shift away from coal mining, which may bring even higher rates of unemployment and stir social unrest in communities depending on mining businesses. Particular care will need to be taken so that disadvantaged communities are not made more vulnerable, including to the impacts of climate change.

These issues have not been put on national or local climate change mitigation and adaptation agendas. There seems to be a lack of active networks bridging the department of environmental affairs with environmental groups, community-based NGOs and the nascent renewables industry (Baker et al., 2015). As a result, the ambitious climate policy has been unable to influence energy policy.

### 8.3 Applying the ‘Justice in Transitions’ Toolbox

These are the kind of issues raised by the ‘Justice in Transition’ thinking tool. What other specific issues might come to the fore in our imaginary province? What issues should business and government leaders there look at, if they are committed to making progress towards a low carbon economy in a just (and therefore socially and politically legitimate) manner? This section addresses these issues guided by Table 4. It takes the various types of innovation as starting point and then assesses the multiple elements of justice in each type.

#### *Justice in technological innovation*

Businesses engaging in technological innovation in the field of renewable energy could turn their

attention to how its benefits could be felt across all social groups, responding to the technological needs of the poor and most disadvantaged groups. In a poor South African province, this has the potential to not only rapidly increase their market share, it would also promote distributive justice (box 1A of the JT toolbox). Wider participation of external stakeholders in decision-making (ie procedural justice, box 3A) can ‘reality check’ business opportunities. Stakeholder input is invaluable to deciding what technological solutions match need, and thus what technologies to invest in, and produce at what scale.

From a recognition-based notion of justice (box 2A), the decisions about who to include in stakeholder engagement processes should acknowledge the differentiated needs of various social groups (eg the elderly, children, women, poor communities). Doing so helps overcome embedded discriminatory norms that may

**Table 4.7 Justice in technological innovation**

Elements of Justice	Technological innovation (A)
<b>1. Equitable Distribution</b>	Make a goal that technological changes serve the needs of all sectors of society, including the most disadvantaged.
<b>2. Recognition</b>	Recognise and consider differentiated technological needs across communities and social groups (elders, women, low-income, the geographically isolated).
<b>3. Equal participation</b>	Give all stakeholders a voice in technology-related investments.  Innovation decisions remain open, even to non-innovation and tweaking previously existing techniques and practices (eg reuse of domestic waste for biogas production).
<b>4. Equal capabilities</b>	Provide all interested stakeholders with the opportunity to acquire skills to work with or make use of the new technology.
<b>5. Justice across time</b>	Avoid technological pathways that involve large scale infrastructure that is very difficult to remove, thereby reducing costs for future generations, and social and environmental risk.
<b>6. Justice across space</b>	Consider how technology impacts directly on the natural environment and on how society interacts with it

prevent their needs being voiced to business and policy leaders.

A capabilities perspective reinforces the need to pursue affordable technological solutions, that are relatively easy to disseminate in poor households at local scales. It also encourages business, government, and community leaders to jointly explore how to support disadvantaged local communities in the province, either those affected by the closing of coal mines or those disproportionately affected by the impacts of climate change. These communities may well overlap. Support programmes could work to decrease vulnerabilities and empower individuals to function in the best way they can in the daily lives of their choice, in the context of their communities (box 4A). This lens sheds light on the importance of having workers in the province who can operate innovative technologies. Given the time required for training, this requires planning and foresight.

The fairness of having large-scale energy infrastructure (eg nuclear power plants and large dams), which pass on to future generations expensive fixed assets entailing hefty maintenance costs (box 5A) should be considered in the context of ESKOM's financial position, as well as the drive towards low carbon. Consideration of justice across time also embraces the current living conditions of children in disadvantaged communities and how their health and education may be affected by a lack of access to affordable clean energy. The consequences can be felt across the lifetime of an individual, and affect his or her children in turn.

Building on this, justice across space (box 6A) supports the pursuit of energy infrastructure development at a range of different spatial scales: from individual home systems and business sized energy production systems, to community sized as well as large-scale regional and national systems. The nested, inter-connected operation of these systems has the potential to provide cheaper as well as more reliable and widespread access to energy (Johns, 2014).

#### *Justice in organisational innovation*

From the point of view of business organisations, aspects such as value chain sustainability, and the very design of products and services should give full consideration to issues of fair distribution of both benefits and costs (JT toolbox 1B) across the chain of companies involved, among workers and across the local communities where they operate in our case study province. Ultimately, a business model based on shared value among stakeholders will win greater legitimacy from leaders in the community and will be favoured by government bodies.

More transparent, inclusive and reflexive processes of decision-making (box 3B) would challenge the powerful network of mineral and energy firms. Nevertheless, stakeholders of the coal mining industry operating in the province could be called upon to share their understanding of the problems at hand, and to take part in the assessment of alternative solutions and the effectiveness of any measures taken. This would enhance transparency and serve procedural justice. These participatory processes should be alive to the needs of different social groups and resist the perpetuation of discriminatory social norms (box 2B).

4.8 Elements of justice in organisational innovation	
Elements of Justice	Organisational Innovation (B)
<b>1. Equitable Distribution</b>	New notions of legitimacy, shared value and entrepreneurship.  Organisations (public or private), workers, shareholders and stakeholders receive a fair share of value created, and shoulder a fair share of costs incurred.
<b>2. Recognition</b>	Encourage reflexive processes helping to review organisation culture, or social norms that have become normalised but may be at the root of inequitable outcomes
<b>3. Equal participation</b>	Involve shareholders and stakeholders more closely in processes of decision making (including problem definition) regarding any form of innovation  Open and inclusive evaluation of outcomes business/public sector (eg are products' life cycles fair; are corporate sustainability targets adequate)
<b>4. Equal capabilities</b>	Engaging collaboratively across public and private sectors to ensure that training and capacity building occurs according to needs and aspirations
<b>5. Justice across time</b>	Adopting longer term objectives and broader views of what constitutes good performance including greenhouse gas emissions and social impacts
<b>6. Justice across space</b>	Addressing justice across all locations and in the value chain, covering suppliers and customers

Public sector leaders could also seek innovative solutions that assess trade-offs across policy sectors, across local municipal boundaries and social groups in an open way. In the case study province, this would require closer, on-going and publicly available assessments of how mining is affecting agricultural productivity as well as access to safe water and food. Public organisations at provincial levels could also assess opportunities to enable cross-municipal cooperation for the delivery of services such as renewable energy.

Regarding the justice dimension of equal capabilities (box 4B), a clear articulation of industry needs and government priorities to attract new industrial actors producing or using renewable energy will be key. From a public sector perspective, the environment, energy and education policy spheres will need to develop and sustain collaborative mechanisms that pull financial resources together. The aim would be a programme of low carbon transition that enhances workers' capabilities and diminish the vulnerability of disadvantaged communities to climate change. From a temporal perspective (box 5B), fairness to the youngest of the current generation will make it more

likely that future generations will reap benefits and not live in more vulnerable conditions than their ancestors.

Honing in on the spatial dimension of justice (box 6B), the value of collective action at multiple spatial scales is reinforced. Depending on the nature of the problem, solutions may need to include spatial scales beyond those delineated by the political and administrative boundaries of town, municipality and province. In the case of water pollution derived from mining and affecting water systems and agricultural productivity, mutually reinforcing actions are needed at a variety of spatial scales to enact change. Spatial scales of impact assessment and decision making may need to include small river catchments, entire river basin systems, biomes, landscapes (for example). This may also enhance the likelihood that benefits and costs will be considered and distributed in a more credible and legitimate way.

*Justice in social innovation*

Social innovation entails the delivery of both economic development and social cohesion objectives such as solidarity, learning, and benefit sharing. In the South African province in focus, two social cohesion objectives aligned with distributive justice (box 1C) can be singled out. One is to ensure access to affordable renewable energy and related infrastructure, tailoring energy solutions to households, businesses, coal communities, agricultural areas and urban centres. A second goal is to devise a short and medium term plan for coal mining communities based on a long term vision of ‘life after coal’. From a recognition perspective (box 2C), the decision of ‘who counts’ should be revisited periodically in order to ensure no discrimination and due recognition of the needs of different social and ethnic groups as well as gender aspects. Clear targets and participatory monitoring regarding the distribution of benefits will enhance legitimacy and effectiveness. Cross-

sectoral and inter-organisational collaboration will need to remain open to scrutiny in order to advance procedural justice (box 3C). From a capabilities perspective (box 4C), social innovation would target those with little or no access to energy and those seeking new employment after mine closures. New entrepreneurial projects enhancing capabilities would empower the latter with the tools and set of skills to fully function in a formal and informal low carbon economy.

Considering temporal and spatial aspects of justice (box 5C and 6C), social innovation for a low carbon economy should ensure that the youngest generation is benefiting from projects, in a way that is enduring and enables longer term benefits. Spatially, it is important to remain sensitive to the needs of the most remote communities, and to ensure that measures to promote renewables are not, in the medium and long term, diverting productive land, harming access to freshwater or degrading the quality of soils. This may be the case for energy solutions based on first generation biofuels.

*Justice in institutional innovation*

Institutions are stable rules guiding social and organisational behaviour. They are thus, by their very nature, difficult to change. State and market actors are key ‘designers’ of the

institutions that set the way in which production and consumption takes place. Institutional

4.8 Elements of justice in social innovation	
Elements of Justice	Social Innovation (C)
1. Equitable Distribution	Making the development of relationships of trust a priority; enhance collaborative capacity across organisations and sectors (profit and non-profit) while monitoring results of collaboration in respect to fair distribution of costs and benefits, including to environmental systems and amenities.
2. Recognition	Acknowledging and addressing a variety of needs for example, women, elder and various ethnic groups in relational processes of social innovation
3. Equal participation	Actively engaging with a variety of views in non-hierarchical style of decision-making  Promoting an organisational culture that values individual differences, experiences and perspectives of the organisation and its role in society
4. Equal capabilities	Seek to empower by pro-actively understanding ambitions, skills needs, and learning-by-doing ways to enhance capabilities
5. Justice across time	Assessing project outcomes periodically, also as a way of monitoring new needs and opportunities for new projects
6. Justice across space	Integrating and recovering stigmatised places and their communities

innovation will depend upon the emergence of a set of actors with profile and funding, who are willing to push borders, experiment, and prove their ability to do things differently and better.

The role of national government seems important to a low carbon transition in the case study province in several ways. Firstly, it has the ability to assess institutional voids and contradictions preventing better distributional outcomes (box 1D), when ‘powering down’ energy production based on coal, and ‘powering up’ renewables. Effective and accountable working relationships with private sector organisations will be needed to generate financially viable and enduring solutions. Government actors have the ability to uniformly set new obligations for incumbent and emergent energy and mineral firms. The principle of ‘no detrimental impact’ on access to food and water of sufficient quality, or on the biological diversity may be important. That access, quality and diversity may well underpin the well-being of future generations (box 5D). New ‘rules of the game’ should be

sensitive to needs and vulnerabilities (box 2D), and the setting of these rules should enable deliberation and inclusion of communities with different opinions (box 3D). Other justice-related obligations may include monitoring and open reporting on efforts taken to ensure access to clean energy to the most disadvantaged communities, and/or to promote new employment to workers in the coal and fossil fuel sector (box 3D and 4D).

To promote justice across scales, the government could fund a training and employment coordination mechanism that stimulates the participation of government entities across sectors and at different levels of administration. Another important role for the national government could be to engage local government actors in systematic sharing of best practice with respect, for example, to how to adapt national initiatives to local conditions, or how to minimize the impact of urban energy production and consumption on nearby rural communities (box 6D).

The transition to low carbon sources of energy in South Africa will require some fundamental institutional restructuring, supported by well-funded coalitions of actors, acting across different policy arenas in a mutually reinforcing way new national and international funding instruments will be crucial. It may be argued that new national and

international funding instruments should work in tandem to support workers in gaining new skills and finding new jobs, at the same time as enhance the ability of local communities to deal with new

4.8 Elements of justice in institutional innovation	
Elements of Justice	Institutional Innovation (D)
1. Equitable Distribution	Structuring of fiscal and other policy incentives is coherent and guides the behaviour of economic actors towards fairer distribution of costs and benefits.
2. Recognition	Enhance the reflexive nature of organisations, considering the assumptions and rules embedded in decision-making models
3. Equal participation	Make rules that encourage open and inclusive innovation processes, reward involvement of external stakeholders, and incentivise cross-sectoral engagement
4. Equal capabilities	Inclusive decision making about new skills training programmes and capacity building initiatives
5. Justice across time	Embed and prioritise duties and responsibilities for future generations
6. Justice across space	Assess mismatches between general rules, and local needs and contexts  Build capacity to adapt general rules to local conditions



environmental challenges posed by climate change. These challenges are often felt in terms of access to water, food and energy, of sufficient quantity and quality.

## 9. Conclusion

This working paper began by introducing the nature of justice and its multiple interdependent elements in the first instance. The more conventional element of distributive justice is connected to other elements of recognition, equal participation and equal capabilities that can be at the root of maldistribution, and are also important in their own right. The cross cutting ideas of justice across time and space are also explained. The paper introduces how these different aspects are present in the institutional and political landscape associated with transitions to a low carbon economy.

Different national and sub-national political agendas are framing the set of economic, social and environmental problems associated with a transition to a low carbon economy. The recent Paris Agreement under the UNFCCC reflects in part the views of two proponents of justice within the low carbon transition: the international labour movement and the Mary Robinson Foundation. Despite their different starting point, there is a clear overlap in the goals of these two organisations. This overlap holds potential for synergies across other governmental and business sectors. Several dimensions of justice are prominent in their approach: a fair distribution of benefits for all sections of society and across the globe; the recognition of rights and needs of workers and communities; the importance of an inclusive process of decision-making; and the crucial role of education and training programmes to enhance capabilities. The work of the Mary Robinson Foundation also accords a sense of urgency to giving poor and vulnerable communities a voice in the efforts to adapt and mitigate climate change, highlighting issues of participation and procedural justice.

The paper turns secondly to review key ideas associated with notions of transition. Three fundamental points stand out:

- Durable transformations only take place when there is a convergence between technological development, policy, science, culture and social practices. There is, therefore, a clear need to go beyond purely technological solutions and link technological innovation with innovative management solutions within organisations; with innovations that work to satisfy social needs on the basis of inclusive partnerships across stakeholders; and with innovations that set new institutional incentives (ie new rules set in policies, laws and organisations) rewarding those who change their ways of doing, deciding, consuming and producing.
- Progression to a low carbon economy will need to be achieved through radical innovation at multiple levels of institutional life (from small and medium-sized business organisations, to national economic sectors, to dominant transnational companies and international organisations). However, for radical innovation to be widely disseminated and absorbed socially and politically, incremental innovation will be equally important in subsequent steps, not least to adjust innovative solutions to particular social and environmental needs and contexts.
- Fundamental change will only come about if there is adequate political reflection and openness in the relations between states, businesses, and civil society, consumers and citizens. State institutions will need to define a coherent set of incentives and disincentives; business organisations need to pursue new visions of value and be open about trade-offs involved in their actions and decisions; and consumers and citizens will need to embrace a renewed sense of civic responsibility towards the collective good.

In a third step, this paper overlaps the six inter-related notions of justice, with the four kinds of innovation critical to the transition to a low carbon economy. The 'Justice in Transition' toolbox emerges as a thought-provoking guide to assess current and alternative paths, and to support decision-making. Finally, to reveal its potential, the toolbox is then applied to three examples: a business example from the financial sector; a sectoral example focusing on energy in the UK; and a geographical example from a province in South Africa.

A sustained expansion of renewable energy production would be a huge achievement. For justice to be promoted as part of such transitions to low carbon, business organisations would be more open as they consider alternative transition paths and assess inherent trade-offs and synergies. The best technological solutions would be accessible to all. Technology investors would listen to and build in the needs of the poor and vulnerable. From the perspective of justice as equal capabilities, and to maintain employment in times of rapid shifts to non-coal energy sources, issues of acquisition of skills and availability of adequate training would come to the fore.

Transformations that explicitly seek to combine human development, social justice and climate change mitigation and adaptation objectives can only be achieved with sustained leadership, funding and will; spearheaded by new political coalitions, and supported by new rules and institutional incentives. Coalitions may include business actors focused on reliable and affordable energy, community interests concerned with long term employment and access to sufficient energy, food and water, and, finally, visionary local public sector leaders that champion coordinated action and succeed in combining funding streams from the energy, environment and education sectors for the benefit of disadvantaged sectors of society. The examples of the UK energy sector and the South African province illustrate the critical inter-dependence of businesses and governmental leadership at different scales of action.

For procedural and distributive justice, and indeed recognition and capabilities, to be advanced as part of such a movement *by business*, the way in which management performance is monitored and rewarded within business may need to change. Leaders in the private and public sectors need to be publicly and financially rewarded for making affordable and reliable alternative energy available - for advancing equitable human development, alongside profit-making economic models. This implies sector-wide innovations in business management, beginning with how organisations set and pursue their objectives.

Across all three case studies, the justice implications of ambitious carbon emission reductions are explored, along with issues of fairness in adapting to climate change, particularly for the poorer and more vulnerable sections of society. The examples raise some of the implications of public and private sector decisions for people living in other parts of the country or the globe, and the ecological systems on which their livelihoods often depend. In cases where global corporations attempt to gain access to natural resources controlled by local governments in undeveloped regions of the planet, a particular acute sense of responsibility must imbue business practices. The JT toolbox helps business leaders to work through many of the justice implications.

All in all, this paper hopes to contribute to reflexiveness and openness in decision processes and in the way that governments, businesses and civil society interact in the pursuit of justice in the transition to a low carbon economy. It is crucial to jointly question "what needs to change, in which direction, with which incentives and with whose involvement?" and embrace a diversity of answers. Solutions will need to be numerous, plural in approach, adaptive and inclusive.

Each of the aspects discussed in our case studies corresponds, in reality, to a complex political space where winners attempt to retain their dominant power and losers struggle to gain their fair share. This analysis did not and could not reveal the full set of issues at stake, and the full extent of the

obstacles to the transition that are embedded in the national and international political economy associated with the case studies. The goal was rather to illustrate the potential of a tool that advances a comprehensive view of justice in transitions, and can support business and policy makers engaging with these issues.

With inside knowledge, future work can address other case studies, such as global finance corporates investing in the fields of energy, food or water; multinationals facing global supply chain management challenges; or energy companies dealing with local communities, particularly the poor and those most vulnerable to climate change impacts.

## 10. Taking this work forward

Throughout this project there has been considerable encouragement from CISL stakeholders to continue devoting attention to the issue of justice, recognising it has been an area that has received relatively little attention – particularly as it relates to business strategies for low carbon transition. Several specific areas were identified where it was felt CISL could play a significant role.

### *(i) Tools and Techniques*

The integration of justice-based processes into sustainability is likely to (appropriately) make data collection and subsequent decision making more challenging. Not only is data likely to be needed from a multiplicity of sources but it is also likely to be incomplete. Moreover, there may be competing perspectives that are difficult to reconcile. Sen specifically highlighted the likelihood that incompleteness may be a constant feature of judgements of social justice owing to incomplete individual evaluations, and lack of congruence between different assessments.

Still, Sen also indicated that such incompleteness does not prevent comparative decision making. In a great many cases there may be considerable agreement about rankings of options. Reviewing and adapting Sen's work to operationalise fair and effective decision-making processes might therefore prove useful to a business audience.

### *(ii) Learning and Development*

In the course of preparing this report several of CISL's fellows and senior associates highlighted their interest in justice-related elements, and were of the view that they might be extended to cover the practicalities of business operations. The potential for dedicated courses dealing with justice issues was also raised, particularly as they could take participants out of their normal work environment and allow them 'space for thinking' and critical engagement with new conceptual and analytical tools.

### *(iii) Strategic Support*

The breadth of the CISL network, spanning business, government and academia could clearly provide the insight needed to support impact identification and vision formulation. Re-purposing an organisation is potentially very challenging, and external perspectives and support are likely to prove invaluable. A helpful early activity might involve benchmarking current business leaders in the extent to which existing initiatives address justice as part of a transition (and hence spread cutting edge practice more widely).

Support for identifying potential transition pathways and their impacts might be drawn up on individual companies, on a sectoral basis (against which organisations in both the private and public

sectors may frame their own actions), or on a geographical basis where the inter-dependence of social and ecological systems is especially evident. In all three cases, the 'JT toolbox' offers much needed assistance to assess current practices and innovation strategies. It should help to identify trade-offs and synergies across social, economic and environmental objectives, and encourage reflection and ethical decision-making in a time when justice is increasingly accepted as a shared moral responsibility.

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# Large tables

Table 2. Key dimensions of justice (incl. time and space as horizontally relevant dimensions)				
	Equitable Distribution	Recognition (eg of needs and rights)	Equal Participation	Equal Capabilities (Proposed by Amartya Sen)
Definition	<p><b>Equity in the distribution of both goods (benefits) and 'bads' (costs)</b></p> <p>Idealised non-biased distribution behind "veil" - ignoring calculations of possible outcomes according to own strengths and weaknesses</p>	<p><b>Psychological dimension</b> -freedom from physical threat; equal political rights; respect for one's culture</p> <p><b>Social status dimension</b> – respect; absence of cultural domination or socially accepted denigration</p>	<p><b>Equal participation in a political process</b> required to address both unequal distribution and misrecognition</p> <p>Underpinned by objective conditions: resources underpin an actor's <b>independent voice</b> and subjective conditions: cultural and social norms influence equal opportunity to hold <b>social esteem</b></p>	<p>Equal opportunities to do and be what one chooses - <b>to fully 'function'</b> in a given society</p> <p>Anything that precludes <b>choice of 'functionings'</b> is unjust</p>
Example	Siblings pre-divide inheritance in lots of equal value; lot chosen through lucky draw seems fair to all	Manifests itself directly in relationships between individuals as well as in social norms influencing individual perceptions about what it is normal and accepted	<p>Equal stakeholder participation leads to better natural resource conservation outcomes (E. Ostrom)</p> <p>Lack of participation with large impacts on the livelihoods of rural communities, and to further marginalise those with lowest social status</p>	<p>If chosen, functioning is being able to access clean water, enough food and keeping warm</p> <p>Then... respective capabilities to be distributed must include – access to water and food, adequate clothing and energy access</p>
Shortcoming	<p><b>Does not address factors causing inequality</b></p> <p><b>Idealised process</b> is impossible to put into practice in most decision-making processes.</p>	Only fully achieved through changes in <b>social norms</b> that no one actor can control (collective effort needed)	Need to pay <b>attention to how representative and legitimate included stakeholders are</b> , and to power relations within communities. Cannot assume coherence of views and interests	<p>Capabilities not listed</p> <p>Individuals and communities need to list the functionings and capabilities of their choice <b>in their social and environmental context</b></p>
Across time (inter-generational)	Climate Justice and the inter-generational issue - <b>moral duties owed by the current generation to future people;</b>	<b>Recognising duties to protect at least the basic rights of children and those as yet unborn</b> to health and subsistence; and potentially their access to an equal quality of environmental system	Adequate involvement of all living generations, and full consideration of future generations' needs in decision processes	Adequate protection of environmental systems ensures capabilities of future generations
Across space (intra-generational)	Climate justice <b>at multiple spatial scales</b> (from the global to the urban), considering social vulnerabilities overlapping in space	Recognising how <b>stigmatisation of places</b> and stigmatisation of people can be inter-related	Participatory decision-making is in practice spatially and socially differentiated	Ensure that recognition and valuation of ecosystems services, contributes to the functionings of those living in and protecting those ecosystems (e.g CBD protocol on access and benefit sharing)

**Table 4.**  
**A TOOLBOX FOR INTEGRATING JUSTICE ELEMENTS IN THE TRANSITION TO A LOW CARBON ECONOMY**

Elements of Justice	Core Co-evolving Innovation Processes promoting a transition			
	Technological Innovation (A)	Organisational Innovation (B)	Social Innovation (C)	Institutional Innovation (D)
<b>1. Equitable distribution</b>	Make a goal that technological changes serve the needs of all sectors of society, including the most disadvantaged.	Spark new notions of legitimacy, shared value and entrepreneurship.  Organisations (public or private), workers, shareholders and stakeholders receive a fair share of value created, and shoulder a fair share of costs incurred.	Make the development of relationships of trust a priority. Enhance collaborative capacity across organisations and sectors (profit and non-profit), while monitoring if the results of collaboration include a fair distribution of costs and benefits.	Structuring of fiscal and other policy incentives is coherent and guides the behaviour of economic actors towards fairer distribution of costs and benefits.
<b>2. Recognition</b>	Recognise and consider differentiated technological needs across communities and social groups (elders, women, low-income, the geographically isolated).	Encourage reflection about organisational culture, questioning social norms that have become normalised but may be at the root of inequitable outcomes	Acknowledge and address a variety of needs (for example, women, elders and various ethnic groups) as part of relational processes	Enhance the reflexive nature of organisations, considering the assumptions and rules embedded in decision-making models
<b>3. Equal participation</b>	Give all stakeholders a voice in technology-related investments.  Innovation decisions remain open, even to non-innovation and tweaking previously existing techniques and practices (eg reuse of domestic waste for biogas production).	Involve shareholders and stakeholders more closely in processes of decision making (including problem definition)  Foster open and inclusive evaluation of outcomes (eg: are product life cycles fair; are corporate sustainability targets adequate)	Actively engage with a variety of views in a non-hierarchical style  Promote organisational cultures that value individual differences, experiences and perspectives of the organisation and its role in society	Make rules that encourage open and inclusive innovation processes, reward involvement of external stakeholders, and incentivise cross-sectoral engagement
<b>4. Equal capabilities</b>	Provide all interested stakeholders with the opportunity to acquire skills to work with or make use of the new technology.	Engage collaboratively across public and private sectors to ensure that training and capacity building occurs according to needs and aspirations	Seek to empower by pro-actively understanding ambitions, skills needs, and learning-by-doing ways to enhance capabilities	Inclusive decision making about new skills training programmes and capacity building
<b>5. Justice across time</b>	Avoid technological pathways that involve large scale infrastructure that is very difficult to remove, thereby reducing costs for future generations, and social and environmental risk.	Adopt longer term objectives and broader views of what constitutes good performance including greenhouse gas emissions and social impacts	Assess project outcomes periodically, as a way of monitoring new needs and opportunities for new projects	Embed and prioritise duties and responsibilities for future generations
<b>6. Justice across space</b>	Consider how technology impacts directly on the natural environment and on how society interacts with it	Address justice across all locations and within the value chain, covering suppliers and customers	Integrate and recover stigmatised places and their communities affected by organisational action	Assess mismatches between general rules, and local needs and contexts  Build capacity to adapt general rules to local conditions