Managing a just energy transition out of the covid-19 crisis

Final Report

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November 2020

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SECTION 1 INTRODUCTION

1.1 The project

This report records the findings of a research study conducted at Erasmus University Rotterdam (EUR) in 2020. It presents a comparative analysis of how the energy transitions in the Netherlands and in the UK are being affected by the COVID-19 crisis, through the conduct of 60 interviews with relevant organisations. The interviews assessed the prospects for achieving a just energy transition in each country moving forward. Funding for this project was provided by the Dutch Research Council NWO. The project duration was from 1 May 2020 until 31 October 2020.

The research team was led by Professor Darren McCauley of the Erasmus School of Social and Behavioural Sciences (ESSB), supported by post-doc researcher Dr Iain Todd and MSc students Cas Bulder and Mary-Kate Burns. Cas is a native Dutch-speaker, which assisted with the setting up of interviews, although all were conducted in English. The interviews were arranged with 15 organisations in the Netherlands and 15 in the UK, with each organisation being interviewed twice – in July and October – to track changes in perceptions. In each country, the target was to achieve 5 governmental interviews, 5 from industry, and 5 from the social sector. Each interview lasted about an hour.

Due to COVID-19 lockdown requirements, all interviews were conducted remotely, using Zoom technology. All interviewees agreed to be recorded and for their comments to be attributed by name and organisation, although in the end we decided to ascribe comments only to the type of social actor e.g. UK industry. The recordings were then transcribed to assist with the analysis phase. This then led to the development of recommendations and conclusions. Further coding work will result in academic papers based on this research work.

1.2 The structure of this report

Each interview was conducted according to the following framework of discussion points: broader societal observations under COVID; the societal groups most vulnerable to the effects of the COVID-19 crisis; the influence of COVID-19 on the energy transition in that country; views on which societal barriers might impede or delay a just energy transition; and finally recording views on any policies, mechanisms or procedures by which governments, industry and others could or should respond to COVID-19 in order to maintain the momentum of a just energy transition.

This report follows that same structure to report the findings made: section 2 addresses COVID-19 and broader society; section 3 covers COVID-19 and the energy transition; section 4 assesses the barriers to a just energy transition; and section 5 reports the views on mechanisms and policies for delivery. Section 6 presents our recommendations and conclusions.

The list of 30 organisations is given in Appendix I, grouped by country and by social actor. This is followed by Appendix II, which draws together comments made during the interviews on international aspects of the energy transition. Finally, in one interview the discussion turned to whether a Just transition Country Index (JTCI) could have value in tracking the development of this subject. This original suggestion has been taken forward by the team, and progress made on this subject during the study period is reported in Appendix III.

SECTION 2 COVID-19 AND BROADER SOCIETY

2.1 Introduction

This section of the report is in two parts. The first part records the observations made by the interviewees on their broad experience of the COVID crisis. These are general in nature and have not been subject to – as are later sections – any numerical analysis. But they are of interest as they form a useful background picture of the broader societal issues against which the prospects for a just energy transition may be assessed. In the words of one interviewee, the experience of the COVID strategy can inform the future strategy on delivering the energy transition.

The second part of this section reports over 90 observations which were made in discussing the societal groups which are most vulnerable to the impact of COVID-19. The significance of this subject is that it is central to considering whether an energy transition can be described as just – i.e. whether it is fair to all sectors of society.

2.2 Broader societal observations

Interviewees made the following general statements regarding their views on the experience of living and working through the COVID crisis. They considered that COVID had demonstrated significant societal behavioural change, and that society can mobilise to meet a major challenge. They noted that a lot of change can happen in a short time and predicted that disruption could make further change easier. One interviewee advised that "we will all come out of COVID a bit different".

Another considered that COVID was a "postcard from the future".

Interviewees recorded an increased appreciation of the quality of life, and a heightened awareness of environmental improvements such as reduced noise and increased air quality. They felt that the society that resulted was more thoughtful, more participating, and held a more localised perspective. The crisis had provided the opportunity for individuals to re-set and re-focus priorities and had led to increased community identity.

Other observations advocated that society was now on track for greater digitalisation; examples given included remote control, remote diagnostics, and increased tele-working, tele-education, and tele-medicine. One interviewee described how the educational system in future would be significantly different going forward due to the COVID experience.

Several noted a renewed appreciation of front-line workers such as those in the health and care sectors. One interviewee from the social care sector thought that some families operate better under lockdown conditions due to spending more time together and had also observed an increased degree of resilience in some vulnerable group families. And one interviewee considered that animal welfare had benefitted from the period of lockdown, advocating greener agriculture, an increase in vegetarianism, and more locally produced food.

As indicated above, these observations are not analysed numerically, but are included to set a general background against which to assess considerations of a just energy transition.

2.3 Vulnerable groups

The core of this report is to assess the effect of COVID-19 on the prospects for a just energy transition in these two countries. A just transition must ensure the fair treatment of all, and for this reason, specific views were sought from interviewees on the vulnerable groups in society. A total of 91 observations were recorded on this subject - which averaged out at around 3 per interview – and these were subject to the following simple numerical analysis. Of the three categories of interviewee – governmental, industry and social – most observations came from the social category of organisation. This category contributed 43 of the 91 observations - 25 from the Netherlands and 18 from the UK; the remaining observations came from government (18) and industry (30) categories.

These 91 observations are sub-categorised below into those relating to economic factors (29), social factors (41), vulnerable workers (15), and finally those which specifically mentioned energy poverty (6). The graph shows only minimal differences between the Netherlands and the UK on this subject.

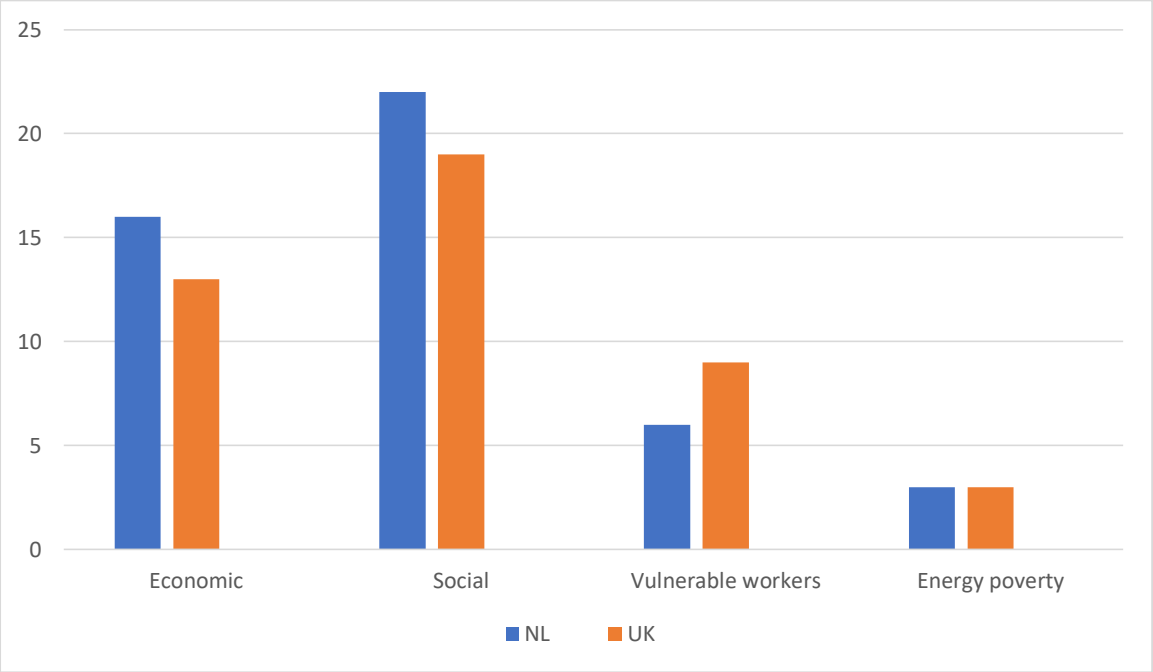


Chart 2.1 Distribution of observations by type of vulnerable groups

These figures are now explored in a little more detail. In each country, most of the observations came from the social category of interviewee. For those relating to economic factors, most observations related to those in lower income brackets (14) and those with flexible contracts (13). These two groups of comments arose approximately equally in the Netherlands and the UK interviews, with no significant points of difference between the two countries. In two of the Dutch interviews, the self-employed were also listed as a vulnerable group, but this was not the case in the UK.

For those relating to social groups, in four of the Dutch interviews the immigrant section of the workforce was mentioned as a vulnerable group; this did not arise in the UK interviews. The comments on immigrants related to both resident in-country immigrant workers, and itinerant migrant workers who were unable to travel under lockdown, often in technical sectors of industry. Interviewees also listed: those in poor health (5, of which 4 in the UK); the physically disabled (4); and the mentally ill (5, of which 4 were in the Netherlands). The latter included comments on dementia, loneliness, and social isolation.

Other broader societal groups highlighted as vulnerable to COVID-19 included the elderly (3), students (7), ethnic minorities (3 – all UK), distressed families (2), those in poor housing (2), and those using public transport (1). Linked to these areas – in connection with poorer families, but also students – several interviewees (5 observations) commented on a lack of computer equipment and IT skills in these groups. This contributed further to social isolation and decreased attainment. Such comments were evenly divided between the UK and the Netherlands.

In considering vulnerable groups of workers, both the economic and the medical effects of COVID-19 were noted. Key groups identified included transport workers (3), healthcare workers (2), retail workers (2), hospitality workers – including tourism and culture – (6), and domestic workers (2). There were no significant differences between the two countries in this section.

In addition to these broader societal vulnerabilities, several interviewees (6) specifically mentioned the role of energy poverty. This was seen very much as an interlinked issue with the broader issues - a further consequence of low-incomes, poor healthcare, sub-standard accommodation, and employment insecurity. One interviewee noted the interconnection between low incomes, poor housing stock, and the high cost of energy in remote areas as creating conditions for energy poverty. The two countries commented equally on the issue of energy poverty.

SECTION 3 COVID-19 AND ENERGY TRANSITION

3.1 Introduction

Prior to the COVID-19 crisis, the world was moving through a fundamental energy transition, switching from carbon-rich fossil fuels to a reliance on renewable energy. Different countries were moving from different starting points, at different speeds. But the direction of travel was the same in all cases. The purpose of this report is to assess through expert advice the impact of COVID-19 on that process in two countries - the Netherlands and the UK.

It should also be explained that while this report adopts a view of energy transition which is society-wide, i.e. the process of transition touches many aspects of society and impinges on many national policies, there are those who take a somewhat narrower view. Much earlier consideration of the process of energy transition has argued only in terms of the jobs of fossil fuel workers, and how these should be protected, compensated, or redeployed. This report takes the former viewpoint. Further, several of the interviewees commented on the position of the fossil fuel major companies, questioning the assumption that they and their workers should be compensated for the energy transition. The interviewees argued that many industrial sectors were worthy of compensation to deal with societal changes, and the COVID-19 experience had reinforced that argument.

This section begins with the general observations made in interview on the energy implications of the COVID crisis.

3.2 General observations on the energy implications of COVID

A total of 67 observations were made on the potential energy transition implications of COVID-19, which is an average of 2 per interview. They may be sub-divided into considerations of energy supply (16 comments – 8 NL, 8 UK), the energy demands of transport (38 comments – 24 NL, 14 UK), and the energy demands of buildings (13 comments – 9 NL, 4 UK).

Energy supply

Beginning with the observations on energy supply, these related principally to industrial policy. Several argued that this should be termed a sustainable industrial policy. Specific mention was made of the technologies of offshore wind and hydrogen, referring variously to 14MW wind turbines which are under development, with matching electrolysers (17MW) which allow offshore electricity to be stored as hydrogen for later use onshore. Interviewees referred to the development of hydrogen networks infrastructures in the Netherlands, Germany, and Denmark, including the example of the Dogger Island project in the Dutch sector of the North Sea. They cited the Dutch target to decarbonise their heating systems (in favour of hydrogen or green electricity) by 2050. Reference was also made of the work of the UK's Climate Change Commission (CCC), which argued in similar terms in recent advice to the UK Government.

There were also two references (1 NL, 1 UK) to the importance of the EU Regulatory Package of green investments, which totals 650 billion Euros. This package is considered further in Section 5 of this report, under funding mechanisms.

Energy demand

The subject of energy demand received three times as many observations as the subject of energy supply, perhaps because it touches more people directly. These observations (51) were sub-divided into those referring to transport demand (38) and building demand (13).

The transport issues related to a range of subjects: air travel for business; air travel for leisure; business commuting; the use of public transport; cycling and walking options. Each attracted significant comment. Most transport comments came from the Dutch interviewees, who were also the sole provider of comments on the benefits of walking and cycling.

Linked to the transport energy demand, interviewees commented on how the growth of home working was proving popular with both businesses (in saving costs) and with workers (in saving travel time and giving more flexibility). This issue was inextricably linked to the explosive growth in the technologies such as Zoom to facilitate the conduct of meetings for both business and personal use. The two countries commented on this issue in equal terms.

The associated energy use in buildings was addressed by several interviewees. Issues covered included better data on energy management, the reduced cost of building maintenance, decreased space provision if homeworking becomes the norm (even partially), and the reduced need for disaster recovery (DR) premises. The building issues received greater comment from the Dutch interviewees, possibly due to recent plans to decarbonise the heating part of the Dutch energy sector.

These figures are grouped by category on chart 3.1 below.

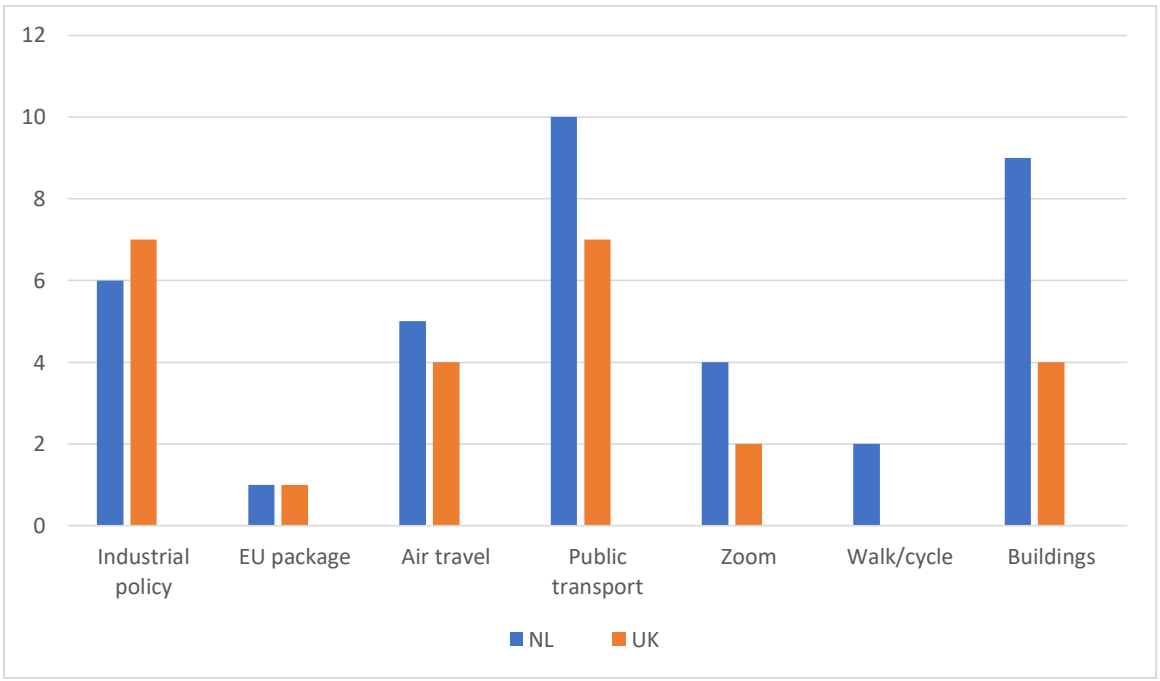


Chart 3.1 Distribution of observations on energy supply and energy demand

SECTION 4 COVID-19 AND BARRIERS TO A JUST ENERGY TRANSITION

4.1 Introduction

Following consideration of broader society and the energy transition, the interview discussions turned to consider the societal barriers acting to prevent a just energy transition in these two countries in a post-COVID environment. These observations made have been analysed within a framework provided by the 8-way taxonomy of societal barriers developed by Todd (2020). This sets out the following broad categories of potential barriers to a just energy transition: government; institutions; industry; technology; finance; society; municipalities; and labour.

The responses to this area of discussion provided a total of 123 relevant observations, coming from the following categories of interviewee organisation: government 26; industry 53; and societal 44. Here therefore most comments came from industry responders. These observations can be categorised into the 8 barrier groups as follows - government (34), institutions (8), industry (20), technology (1), finance (17), society (24), municipalities (4), and labour (15). They are displayed in the graph below. This shows only minor differences between the Netherlands and the UK on this subject.

The observations for each of the barrier types is considered in more detail in the sub-sections which follow the chart. It should be recognised that in a small number of cases, an observation was recorded in more than one category of barrier, if it was relevant to both of those two categories. These are made clear in the sub-sections which follow.

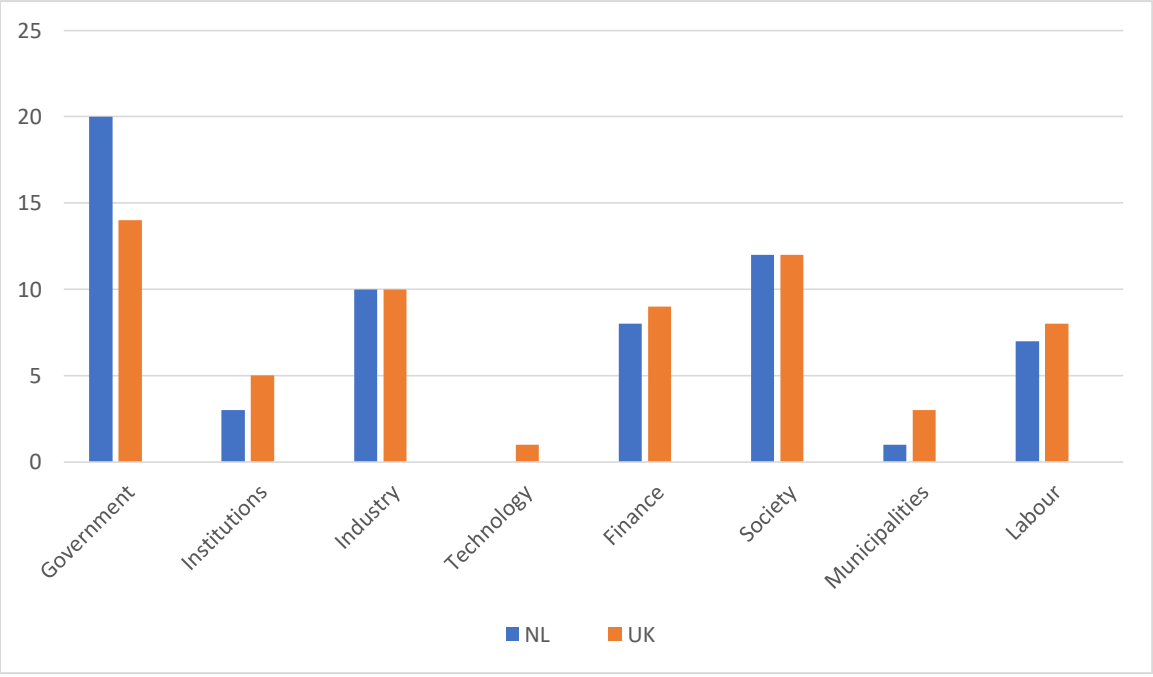


Chart 4.1 Distribution of observations by barrier type

4.2 Discussion of individual barrier types

Governmental barriers

The subject of governmental barriers received the largest number of observations (31). The largest component of this group (11 observations – 6 NL, 5 UK) were comments on the uncertainty of government decision-making. Interviewees mentioned a lack of political direction, a fragmented approach, polarised views, short-termism, and a blame-game. Seven comments (4 NL, 3 UK) related to the economic downturn, which would weaken Government resources and so their ability to act. Two comments (1 NL, 1 UK) addressed a possible loss of political priority for the energy transition, with COVID either displacing the policy of energy transition, or distracting the government from it. And a further two observations considered that public-sector decision-making was too centralised, and that there was significant disparity between regions; these two comments are included also in the section on municipalities below.

Four comments were made by Dutch interviewees on growing nationalism and populist policies; no UK comments were made on this subject. (These four comments have been incorporated also in the society category below). One further comment criticised the neo-liberal world-view prevalent in the Netherlands.

A significant sub-set of this grouping related to the "immense" political influence of oil majors such as Shell (7 observations – 4 NL, 3 UK). (These are also included in the industry section below). These companies were described as "potential losers" in an energy transition, and comments spoke of hostility, the enemy, and that they personified negative aspects of capitalism. Several commented upon their excessive political influence, and that for them to receive post-COVID financial support – at the expense of the poorest in society – was highly regressive.

Institutional barriers

This category of barrier attracted relatively few comments – 8 (3 NL, 5 UK). These comments addressed the subject of over-regulation by state bodies slowing the process of an energy transition, and the hurdles which projects had to face in the planning system. Two UK comments related to the effect of Brexit cutting links between the UK and the strategic direction and resources of the wider EU. One Dutch interviewee feared the effect of protectionism coming from new trade agreements, which could act to impede a just energy transition.

A further interviewee – again Dutch – noted the absence of any monitoring systems for societal inequality, both nationally and with respect to municipalities. (This observation also repeated below under municipalities.)

Industry

The observations on an economic downturn are repeated here, as they will weaken not only the government but also industry. Further, the above comments on the oil majors are included here. In addition, two interviewees (1 NL, 1 UK) listed as a potential barrier that industry would revert to "old ways" or "old patterns" of doing things, because it was simpler and less challenging, perhaps to survive. A further two interviewees (again, 1 NL, 1 UK) observed that the falling price of oil due to COVID would act to impede the progress of a just transition.

One interviewee (UK) listed as a barrier the fact that if a facility is improved during the energy transition it would attract higher business rates to be paid to government, and this acted against the move to cleaner fuels. And a further interviewee (UK) wished to see the nationalisation of the energy majors.

Technology

From all interviews, only one comment was received – from UK industry - which indicated that technology could act as a barrier to an energy transition. This related to the fact that the electricity grid was not appropriate to deal with the high degree of decentralised energy which could result from an energy transition.

Finance

By far the largest group of observations – 15 (7 NL, 8 UK) – considered that a lack of finance would act as a barrier to a successful and just energy transition. Interviewees used terms such as a return to austerity, competition for scarce resources, recession, government borrowing at record levels, and local authorities "burning their reserves". This aspect was obviously highly related to the resources which had been used in dealing with the COVID crisis.

A second financial issue raised by two interviewees – 1 NL, 1 UK – was the issue of inter-generational tension. They considered that social disquiet could result if the post-COVID world placed different burdens and benefits on the young and the old in society.

Society

A wide range of observations have been placed in this category. Two interviewees – 1 NL, 1 UK – considered that fear of change could act as a barrier, or conversely a drive to "change everything". The four Dutch comments on nationalist and populist policies - already been mentioned under government - are repeated here. A total of 5 observations (3 NL, 2 UK) related to the lack of IT skills and equipment in society to deal with changes that could flow from COVID. (And these observations are repeated under the workforce grouping below also.)

The largest sub-group in this category considered the fear of using public transport resulting from COVID, which could act as a significant barrier to an energy transition. This was mentioned as a barrier by 8 interviewees (3 NL, 5 UK). They continued that such a trend would also lead to increased road traffic, and so emissions.

Other diverse observations of potential barriers in this category included the following: a lack of engagement with some sectors of society, especially migrants and ethnic minorities (1 NL); a harsher social environment (1 NL); disrupted education, at all levels – primary, secondary, tertiary (1 UK); the NIMBY factor (1 UK); and resistance to wind farms as they financially benefit only farmers and not the whole community (1 NL).

Municipalities

In only 4 observations were municipalities cited as a potential barrier to an energy transition post COVID. The remarks about an absence of inequality monitoring, and decision-making being too centralised, have already been mentioned above. Other comments related to how community projects – which are needed - suffered from a lack of capability, infrastructure, and resources.

Labour

This grouping attracted a total of 15 observations. The principal contributors have already been described and are repeated here: the 6 observations on economic downturn, which would also weaken the workforce; and the 5 observations on the lack of IT skills and equipment – mentioned above in society – are relevant specifically to the workforce. A further 3 observations – from a UK trade unionist - described the need to change the nature of work, the threat of job-automation, and how trade union resistance could impede an energy transition if the process was perceived as unfair. A final interesting comment in this section – from a Dutch social organisation – observed that many green jobs – for example in solar panel manufacture – create employment for overseas, not domestic, workforces.

SECTION 5 POLICIES AND OTHER MECHANISMS TO ENSURE A JUST ENERGY TRANSITION POST COVID

5.1 Introduction

Following the consideration of barriers to a Just Energy Transition in a post-COVID environment, the interviews continued by focussing on how these barriers might be overcome. Interviewees were asked to identify policies and other mechanisms which the social actors should adopt to improve the prospects of delivering a just energy transition following COVID-19 lockdown. A total of 113 observations were recorded in this part of the discussions. They are described in the remainder of this section, according to the same structure used for the barriers in section 4.

The observations may be sub-divided in several different ways: by nationality – 54 NL, 59 UK; by the type of organisation being interviewed – 29 governmental, 44 industry, and 40 third sector; or by type of barrier being addressed – 57 government, 8 institutions, 10 industry, 19 finance, 9 society, 4 municipalities, and 6 labour. These figures are illustrated in chart 5.1 below. As in section 4, a small number of observations have been allocated to more than one grouping where it is appropriate to do so. Where this is the case, it is explained in the text.

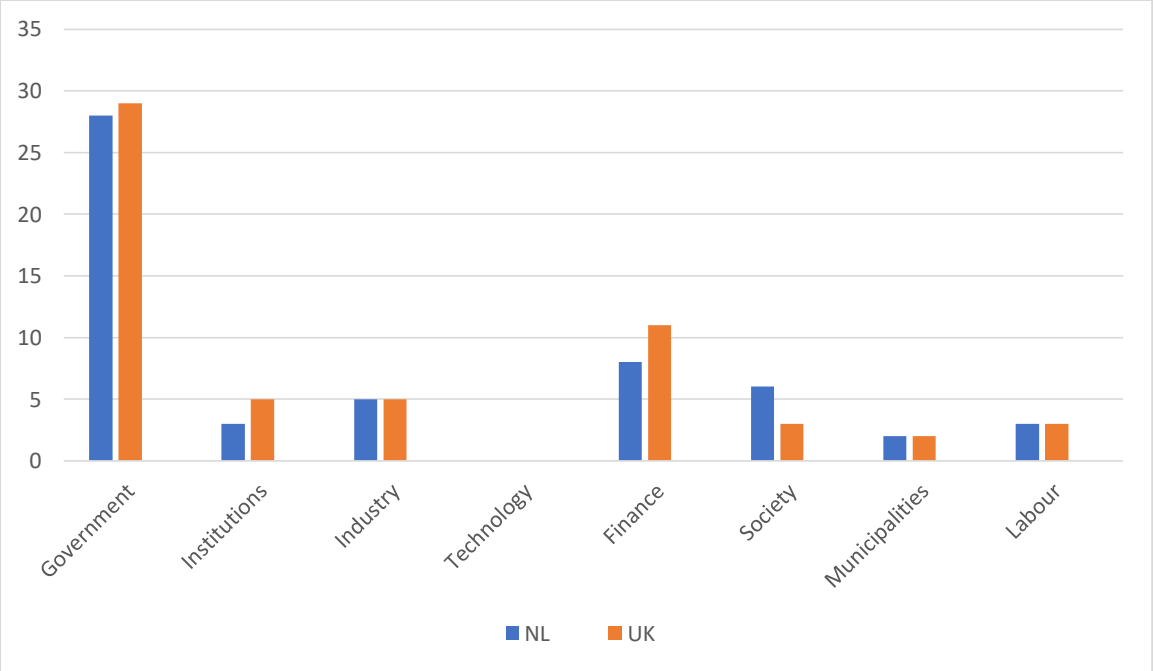


Chart 5.1 Observations on suitable policies and other mechanisms by target barrier

It may be seen immediately that half of the observations made related to the role of government. The second highest category is finance. In view of the importance of governmental action, this category has been sub-divided further into observations on fiscal policy (11), investment policy (28), business policy (9) and communications (9). These figures are shown graphically in the chart 5.2 below.

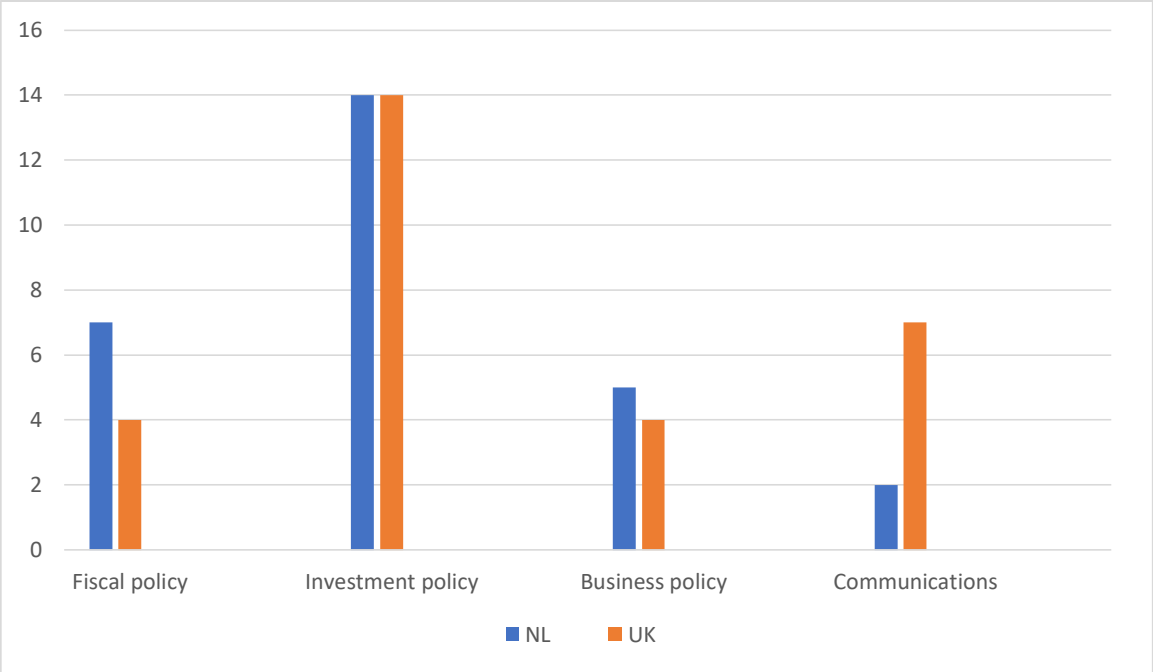


Chart 5.2 Sub-divided observations on suitable Government policies and other mechanisms

5.2 Discussion of policies and other mechanisms by individual barrier type

The following sub-sections discuss the policies and other mechanisms for each of the above categories in turn. In these sub-sections, observations are reported firstly in terms of relevance to broader society and secondly in terms of relevance to a just energy transition.

Governmental policies and other mechanisms

The subject of governmental mechanisms and policies received the largest number of observations (57). This might be unsurprising as government is often regarded as the entity responsible for the overall delivery of complex policies such as the energy transition, as indicated by several interviewees. These 57 comments have been sub-divided above into the four component parts described above, which are now addressed in turn.

A variety of comments were received on ***fiscal policy,*** divided into NL 7, UK 4. Several interviewees argued for a more progressive tax regime in their country, or that there should be greater redistribution of wealth. One suggested that tax changes should focus on new sources of income - for example overseas tech-giants – to create a fairer society and increase funding for public services and the transition. Others favoured the introduction of a Universal Basic Income (UBI), as has been piloted – for example - in Finland. Moving to the energy transition, several interviewees mentioned the desirability of a carbon tax, bemoaning its delay in the Netherlands particularly, and noting that too many exemptions from its introduction had been agreed. One interviewee considered that taxes on car use should be increased, especially in areas of traffic congestion.

Turning to ***investment policy***, interviewees expressed a variety of views – over and above the simple availability of sufficient finance to support the energy transition (which is considered below under the sub-group on finance). The observations were evenly balanced between the two countries – 14 NL, 14 UK – and argued for a mix of carrot and stick policies. Many sought a long-term approach to decision-making from their government. Support for education was requested, especially a life-long approach to the subject, and more IT equipment for schools. Several wished to see a greater emphasis on IT and how it could improve business efficiency more generally. There was also an emphasis on tackling vulnerable groups and providing better healthcare. In terms of the energy transition, comments sought a commitment to the re-skilling of workers for the new green industries, with one interviewee seeking a Government Training Fund for this purpose. Several advocated increased Government support for community energy schemes (repeated below under municipalities). Support was also advocated for R/D and innovation in respect of the energy transition. Suggestions were also made on specific green investment opportunities presented by COVID-19, but these are addressed in the sub-section below on finance.

On ***business policy***, there were a total of 9 observations made, divided almost equally between the Netherlands and the UK. One trade union interviewee supported the concept of a sustainable industrial policy, which would couple the twin challenges of climate change and job creation. Two interviewees – again from trade unions – raised the issue of whether new trade international agreements could threaten existing standards of "environmental protection and human protection". Equally, they considered that trade agreements – if properly drafted - could provide important protection in these areas. On a related point, one UK industry interviewee advised that they wished their government to adopt a trade export strategy, to support the export of services in the new green-tech sectors. One Dutch interviewee raised the interesting warning that green investments could benefit overseas rather than national supply chains.

The fourth sub-set of governmental measures addressed ***government communications***. This arose in 9 interviews, where there was an interesting split between NL 2 and UK 7. Though being asked, Dutch interviewees indicated that communications were not within their expertise or focussed more on other mechanisms. Of this total, 6 proposed a national communication campaign to assist the behavioural changes necessary to advance a just energy transition in a post-lockdown world. A related comment was that the government should do more to communicate with consumers. One of the Dutch comments spoke favourably about the recent communication campaign of the Dutch government called "Together Against Coronavirus". Addressing specifically the low-income groups, three comments (2 NL, 1 UK) emphasised that they must be involved in the transition, seeing it as government's task to be inclusive towards this societal group. By keeping the transition affordable – and beneficial for low income families - they would be incentivised to become more involved.

Several further observations on Government action included: an increased emphasis on union consultation and tri-partite economic planning (also described below under labour); policies to reform the fossil fuel industry; moving away from traditional heavy-build projects; and increasing political commitment to dealing with climate change.

<u>Institutional policies and other mechanisms</u>

This category concerns policies and other mechanisms related to regulation by state-bodies or other institutions. This sub-section received 8 observations, equally balanced between the two countries. Two comments (2 UK) related to government regulation which should combine the carrot

and the stick to stimulate companies to go towards net zero. Several individual comments referred to: altering the responsibilities of the UK energy regulator OFGEM to include decarbonisation (1 UK); ensuring more transparency about how money is being spent (1 UK); and setting up a national coordination system and data-bank to more effectively aid vulnerable groups in the transition (1 NL).

Several UK interviewees argued for the streamlining of the national planning system, and one NL interviewee expressed strong support for the value of co-operative fora in which diverse bodies worked together.

Industrial policies and other mechanisms

A total of 10 observations related to action by industry, and these were supplied in equal numbers by the two countries. The comments were also equally spread between the government, industry and third sector interviews. These observations advocated the need for industry to work more with communities (2 NL, 4 UK). Some of these comments linked to the need for a Green Recovery (1 NL, 2 UK), necessitating action by both government and industry. As companies had been disrupted already by COVID-19, further change might be easier and beneficial. One UK interviewee added that this might be particularly relevant for the transport sector.

Another comment encouraged industry to facilitate more home working by its employees. But several interviewees expressed caution regarding drastic changes to the nature of work and education, noting that working from home could be a huge burden for those with inappropriate home working conditions.

One trade union interviewee argued for increased collective bargaining to be taken up by industry. The subject of re-skilling also featured in these responses, as was the increased use of IT to increase business efficiency. One comment (UK) deemed it vital that energy industries should communicate more across silos, as different factions of the energy industry often remain un-connected and un-coordinated between each other. Another interviewee wished companies to adopt more localised supply chains.

Technological policies and other mechanisms

As noted previously in section 4, interviewees did not advance new policies in terms of technology, other than – as mentioned above – that both industry and government should maintain their support for R/D and innovation. One further (UK) comment identified that some technological improvements - for example home insulation - are insufficiently focussed on the user, especially families in social housing. Policies involving technology should thus focus more on sociological aspects.

Financial mechanisms and policies

A total of 19 observations were recorded on financial mechanisms and policies, making this the second most commented upon category after government. There were slightly more comments on this subject from the UK (11) than the Netherlands (8), and of those the most frequent was from UK industry (7). Of the 19 comments, 15 reflected that the availability of finance was an essential

component of delivering a just energy transition. The upfront cost of new technology was recognised as a risky and expensive investment, competing with the tradition technologies.

One interviewee emphasised that private sector finance was as important as government, although another advocated that with industry under economic pressure, government had to increase their relative contribution. Public-private partnerships were suggested (NL 1) as a response to stabilise investment levels, with government compensating low private investment levels by increasing investment by the public sector. Both sectors and government should take care to prioritise viable, profitable, and self-sufficient projects, whilst dropping projects no longer required, so releasing capital for other projects.

As 'lack of available finance post COVID' was the largest group of barriers, it is interesting that interviewees (UK 2) regarded investing in long term renewable energy projects as an adventitious economic stimulus to propel the economy in the COVID recovery. In both Dutch and UK responses, the need for stable policies on renewable investment was noted as a necessary mechanism to create market stability, security and market return for investors while maintaining long-term levels of investment. However, capacity pinch (NL 1, UK 1) was raised as a concern for investment stability since supply chains and sufficient infrastructure would already need to be established. Thus clear, long term timeframes and stable investment paths are needed. However, with financial uncertainty from COVID, caution must be taken to avoid delaying investment decisions on the premise that there is time to spare when operating with 2030 or 2050 timeframes.

While strained financial capacity is a valid concern, COVID also presents a unique opportunity to redistribute government funding from traditional infrastructure projects to green infrastructure, to promote societal revaluation. Two UK interviewees argued, "long-term behaviour changes we've been trying to bring about through the energy transition happened almost overnight because of COVID" and there is now a greater appetite to invest in green growth. With societal re-evaluation, a window of opportunity has been created to reallocate budgets from now less favourable heavy build infrastructure projects, to finance instead green infrastructure to serve future generations.

In a similar vein, interviewees from both countries argued that COVID has proved how abrupt lifestyle adaptation is possible in society, which increases the likelihood of an energy transition being accepted, since people have learned to be resilient and open minded to change. Another interviewee argued that the energy transition investments were a matter of national security as they decreased dependency on foreign energy sources while simultaneously creating local jobs and resources. This could secure public support.

Several expressed views – for and against – on whether the government should attach environmental conditions to any award of grant finance for green infrastructure. Two interviewees mentioned investment by pension funds – firstly that they should do so on ethical grounds, and secondly that such funds should divest from fossil fuel companies. Finally, one interviewee raised the issue of health insurance providers having both an economic and an ethical interest in pursuing a just energy transition.

An interesting paradox arose among responses on the issue of government investment. On one hand, interviewees (NL 2, UK 1) argued that during a crisis, government support for new investment falls. Meanwhile other respondents argued that COVID has made people question their individual contribution to the future, and the energy transition will be high on the list of government priorities, thus simplifying financial bids for green infrastructure projects. In the previous section,

intergenerational tension on young and old post COVID was discussed as a barrier to a just energy transition, but a UK interviewee argued that COVID has reinstated government focus on climate change moving forward.

One UK interviewee argued that governments have a poor track record of both measuring and fully spending investment budgets. A 'Just Transition Index' and the release of periodic project reports on how finances are being spent, were offered as means of increasing transparency, measuring effectiveness, and holding governments accountable to their commitments.

However public acceptance must be in balance with the speed of investments and infrastructure (UK 1), and it is therefore essential that local governments involve citizens in planning so that energy investments suit that area. Since the price of oil has dropped and fossil fuels are cheaper since COVID, an interviewee raised the issue that governments will face a challenge in communicating the transition, particularly to vulnerable households. Communication campaigns and buying citizens into community energy projects, where the choice of changing energy supplier is "like changing a television", will be vital moving forward. Moreover, it was highlighted (NL 1) that the fall in fossil fuel are an opportunity to table divestment policies; however, price drops won't automatically lead to investments in renewable energy and will require pressure and demand from the private sector.

Finally, Dutch interviewees noted that 75% of their energy transition fund was allocated to industry, creating a system where consumers carry a disproportionate share of the transition bill. A balanced policy approach to the cost of transition was essential for public support. This should encompass airline bail-out, reduced demand for public transport, and the need to reduce private transport.

Societal policies and other mechanisms

The measures identified from a societal viewpoint were addressed in 9 observations (NL 6, UK 3). Beginning with those of a broader nature, suggestions for improving social justice fell under themes of protection (e.g. public transport, and vulnerable groups), empowerment (e.g. community energy projects) and communication (energy consumers, and again, vulnerable groups). One interviewee argued for more democratic ownership in society, citing the housing, transport, and social care sectors. Another pointed out that members of society now had to adapt to a different lifestyle.

More broadly, a recurring theme across interviews was that the COVID crisis has provoked a re-evaluation of essential jobs in the healthcare and education sectors, mirrored by a demand to recognise and reward key workers. However, no specific policies or mechanisms were identified.

On the energy transition, several observations addressed the need for consumers to be more aware of the energy costs of the products which they purchase, and a related point supported the move to buy food supplies more locally. One interviewee predicted that in future consumers would think hard about personal international travel. Both Dutch and UK interviewees referred to a general fear of using public transport due to COVID, and the risk of instability in this sector. Disrupted education was also mentioned as a barrier in the previous section, and one UK interviewee made the connection that if public transport costs rise, this could be a barrier to staff and students, so impacting a student's choice of university. To address this issue, interviewees

deemed it essential to ensure that the public transport sector is financially supported, and transport jobs are a focal point of a green recovery.

Interviewees from both countries highlighted that the "already vulnerable" groups in society would be made more vulnerable from COVID. The creation of national databases for vulnerabilities (broad and energy based) were offered as solutions to be developed (NL 1, UK 1). More specific to energy, a policy to protect low-income groups in the transition was raised by both Dutch and UK participants.

Municipal policies and other mechanisms

Mechanisms and policies for the municipal sector received relatively few observations – only 4, again divided equally between the two countries. These covered two subjects which have already been reported in the sub- sections above, namely the need for community energy projects, and the need for municipalities and industry to work together. While many responses agreed that community energy projects, community control over energy, and involving towns and cities in the energy transition were vital, specific procedures or mechanisms for their establishment or success were not mentioned. This might infer that community involvement is still an area of uncertainty for local governments. However, it would also be true to state that our interviews did not focus on a municipality perspective – there were only a few interviews with this level of governance - rather we concentrated on the national level.

One specific recommendation (NL 1) was for government to monitor energy poverty in municipalities on a national basis. This could deliver greater inclusivity for low-income consumers and minority social groups.

Participatory government was discussed in a significant number of the Dutch interviews, since government is more decentralised than the UK, and municipalities have received greater responsibility and resources for managing the COVID response. However, due to inadequate financial support and high deficits from COVID, municipalities are cutting vital social services. Redistributing government funds according to governing responsibility was suggested by several interviewees as a mechanism to correct this issue.

A further important point raised was that since municipalities have the common goal of achieving net zero carbon societies, there should be a greater emphasis on cooperation between municipalities. This would allow for knowledge exchange and a faster transition, as well as providing the capacity to comparison and monitoring across regions. This procedure could also be applicable to the UK on a city council level.

Labour-related policies and other mechanisms

A total of 6 observations were made on the labour-related sector, suggesting how just job transitions could be established and how injustices within the labour market could be corrected post-COVID. These again covered both broader and energy subjects. The findings were complex, as contradictions arose around trade unions, retraining for green jobs, and the changing nature of work as potentially having both positive and negative implications for social justice.

COVID was framed by several participants as an opportunity to "cut unnecessary jobs" in the fossil fuel industry, while simultaneously "marrying up" the economic recovery from COVID with a

green economy and green jobs. One UK industry interviewee – from the financial sector - coined the phrase “creative destruction” i.e. allowing jobs which are no longer profitable nor valuable to society to phase out, to be replaced by new jobs with new skillsets.

Education was a key theme in this category, and “life-long education” was framed as a solution to address several barriers at once. It was argued that skills (re)training should be a “cradle-to-grave” education service, made easily available and affordable to people who decide to retrain later in life. This should include those without formal qualifications, as traditional retraining opportunities are predominately only offered to those already in employment. Several interviewees highlighted a significant skills shortage - particularly at the community level - within the renewable energy sector, notably associated with electric vehicles, domestic energy technology and hydrogen fuel technology. Skills (re)training would also address youth unemployment, empower those without university qualifications, and sustain the expansion of low carbon technology. However, it was stressed that (re)training programmes should be designed bottom-up, with industry and businesses informing what exactly is needed from the work force.

Interestingly, two interviewees were critical of the just transition paradigm of retraining and reskilling the work force for a low carbon society, raising valid concerns that there is no guarantee that “green” job opportunities will arise in the same regions as unemployment. Neither should it be assumed that workers necessarily will wish to retrain. Therefore “creative labour adjustment” must focus on workers and what their individual aspirations are, providing a wide array of options.

Trade union interviewees also argued for greater collective bargaining in the industrial setting, and for a restructuring of the labour market. Another advocated an essential living wage and adequate sick pay for all workers. A related subject raised was support for a policy of Universal Basic Income. One interviewee observed that the furlough scheme in the UK was already a significant move in that direction.

SECTION 6 RECOMMENDATIONS AND CONCLUSIONS

6.1 Introduction

This section records the recommendations and conclusions of our research. Section 6.2 sets out the 10 draft recommendations identified from the Round 1 interviews, which have been described in sections 2-5 of this report. Section 6.3 then describes the Round 2 interview phase. In this phase we asked the same interviewees to prioritise the draft recommendations, to provide further comment on the matters discussed in their Round 1 interviews, and to consider the significance of the EU Green Deal towards the delivery of a just energy transition. Section 6.4 sets out our recommendations and conclusions, which includes some observations on differences between the responses received from the two countries. Section 6 of this report also forms the basis of our (separate) Executive Summary document.

6.2 Draft recommendations identified in Round 1

We set out in table 6.1 below the suite of 10 draft recommendations identified from our Round 1 interviews. They are based on the range of possible mechanisms and policies which have been reviewed in section 5 of this report. They are grouped according to social actors.

Sector	Recommendation
Exchequer	Tax regimes should place a higher priority on social justice, especially considering vulnerable groups
Exchequer	Investments in green technology must be maintained, and preferably increased substantially
Education	New re-skilling and training mechanisms are needed for all workers under transition
Education	New national communication campaigns on 'long-term' behaviour changes
Employers	Industry must also invest in the just energy transition
Employers	Increased home working should be better facilitated with well-being initiatives
Employees	Targeted support needed for employees in 'vulnerable group' categories
Employees	Non-fossil fuel employee categories need equal financial compensation recognition
Energy	Investments in hydrogen and offshore wind urgently needed
Energy	Reduction in transport and building demand must be a long-term trend

Table 6.1 Key recommendations arising from Round 1 interviews

6.3 Prioritised recommendations identified in Round 2, and other Round 2 findings

This section sets out the findings of the Round 2 interviews, as follows: sub-section 6.3.1 addresses the prioritisation of the 10 draft recommendations; sub-section 6.3.2 records additional valuable points made to us in the Round 2 interviews ; and sub-section 6.3.3 reports the key points made in response to a new question raised in Round 2 – the importance of the EU Green Deal to a just energy transition post-COVID.

6.3.1 The prioritisation of the 10 draft recommendations

Prior to each Round 2 interviews, we invited the interviewee to place in priority order the suite of 10 draft recommendations identified from the Round 1 interviews. This activity was completed by 22 of the 27 Round 2 interviewees; several interviewees advised that "all of the recommendations are important". The results are set out in table 6.2 below, according to the following key:

	Ranked 1-4 + = first		Ranked 5-7		Ranked 8-10 *= last

Recommendation	Overall	NL	UK	Gov't	Industry	Third sector
Governments must maintain and preferably increase substantially – investments in green technology	+		+	+	+	
Governments should adapt tax regimes to place a higher priority on social justice, especially considering vulnerable groups		+				+
The energy demands of transport and heating must be reduced, involving communities and municipalities						
Industry must also invest in the just energy transition						
New re-skilling and training mechanisms are needed for all workers under transition						
Investments in hydrogen and offshore wind are urgently needed						
Targeted support is needed for employees in the vulnerable groups						
Financial compensation (for transition) must be equitable, not restricted to fossil fuel workers			*			
There should be increased national (and local) communication campaigns on long-term behavioural changes		*		*		
Employers should facilitate home working with wellbeing initiatives	*				*	*

Table 6.2 Prioritised recommendations from Round 1 interviews

The differences in the results of prioritisation – between countries and between social actors - are some of the most significant findings of this research project. The key observations may be set out as follows:

(a) The theme of investment (by both governments and industry) was considered central by all parties, securing the highest rankings in the results submitted. In the words of one UK industry interviewee, "projects follow money".

(b) The second priority was tax reform in favour of social justice, which again secured widespread support (although less from UK interviewees and industry interviewees). Several mentioned the need for more progressive taxation.

(c) The third priority was given to the behavioural changes needed – by all parties – to reduce the energy demands of the heating and transportation sectors. Specific mention was made of the need to address the renovation of building stock, citing the recent EU announcement on the Renovation Wave.

(d) The need for re-skilling initiatives was accorded a high priority by industry, the third sector and the UK, and an intermediate level by the Netherlands and governments. This resulted in an overall intermediate position.

(e) The most divisive of the recommendations was the one which emphasised the specific technologies of hydrogen and offshore wind. The UK and the industry contributions gave this the highest ranking, while the Dutch and the third sector recorded the lowest priority. The Dutch third sector questioned the practicality and affordability of hydrogen, and favoured community investment. This therefore resulted in an intermediate overall ranking for this recommendation. One interviewee wished to include investment in grid infrastructure in addition.

(f) The suggestion of national communication campaigns to reinforce the need for behavioural change received a lesser priority, although intermediate by the UK and industry respondents. Overall, it gained a lesser priority.

(g) All considered that additional efforts to support home working merited the lowest priority. One interviewee explained that such change was already well under way, and so did not require additional priority.

6.3.2 Supplementary comments made during Round 2 interviews

The interviewees in Round 2 provided a wealth of additional comments on the prospects for a just energy transition post-COVID. These interviews were more focussed on the key issues than the rather more exploratory nature of the Round 1 interviews. This reinforced the importance of repeat interviews. These supplementary comments are set out in table 6.3 below, in order that they are recorded. The interviewees are not named, although their broad affiliation is given.

Sector	Supplementary comment
Dutch third sector	The second (current) COVID wave is characterised by less resilience, more fear, less unification, less compliance, and increased domestic violence
UK industry	We need a wide range of green technologies, not just hydrogen and offshore wind. Heat networks and retrofitting should feature also
Dutch government	Lower gas prices have undermined progress on carbon reduction
UK industry + Dutch third sector	COP26 – which is to be held in the UK in 2021 - needs to make serious progress on carbon taxation
Dutch government + UK industry	Unused/under-used office space should be utilised for housing or launching new businesses
Dutch third sector	There are now many competing societal issues – Black Lives Matter, US election
UK industry	Germany has a detailed hydrogen strategy
Dutch third sector (several)	Since the Round 1 interviews, the issue of new nuclear power had gained prominence in the Netherlands.
UK industry	The state has a duty to deal with the negative impacts of the energy transition
Dutch third sector	The Netherlands is second to only the US as an offshore tax haven
UK industry	For businesses, volatility is the new normal
Dutch third sector	Societal changes should include guaranteed employment and a shorter working week
UK industry	Every country needs a new green deal
Dutch third sector	The repayment of borrowing for investment is an inter-generational issue
UK third sector	Further education is reverting to on-line teaching only
Dutch third sector	There is a need to concentrate on the “lost cohort” leaving education

Table 6.3 Supplementary comments from the Round 2 interviews

6.3.3 Responses relating to the EU Green Deal

The Round 2 interviews were also used as an opportunity to explore the views of the interviewees on the EU Green Deal. This was over and above the comments made on international issues during the Round 1 interviews, which are reported separately in Appendix II.

The Round 2 interviewees were broadly very supportive of the EU Green Deal. All supported the investments being made to deliver an energy transition, and the profile of the initiative had been reinforced by the COVID crisis. The ability of member states to achieve their targets by investing in projects within other member states was welcomed. Interviewees from the municipality of Rotterdam mentioned their preparation of projects to apply for Green Deal funding.

On the justice of resource distribution within the EU, interviewees agreed that it was right to distribute the benefits according to need. Poland was often mentioned as a country requiring much support, in view of its high dependence on coal. But it was important to secure optimisation once distribution had been decided. One UK industry interviewee reported poor building standards in Poland.

One Dutch third sector organisation regretted that the Green Deal lobbying had been dominated by the oil and gas industry. They also considered that some of the investment should benefit the Global South in some way.

Discussion of the Green Deal also attracted cross-references to firstly the recent Chinese commitment to a Net Zero target, and secondly the prospects for a different US position following the November presidential election. Several interviewees also referred to the COP 26 conference to be held in the UK in 2021, as a major opportunity for the energy transition, particularly for carbon taxation.

6.4 Conclusions

This closing section considers the conclusions that can be drawn from this 6-month project. We would open with the conclusion that the structured plan for the project has proved successful. From the outset, it was realised that repeat interviews would be necessary to cope with a rapidly changing environment, and that has been borne out in practice. A balanced number of interviews have been conducted between the two study countries, and that has been achieved. Similarly, balanced numbers of interviews have been conducted between the interests of government, industry and the third sector, and this has been a significant strength. One possible improvement could have been a higher number of interviews with Dutch industry.

On national differences, the first thing to say is that the Netherlands and the UK are similar countries in terms of many factors – economy, social, political. The interviews displayed much more commonality between the views of organisations in the two countries than they identified differences. Both countries commented heavily on changes in transport behaviour, the significance of building heating, flexible working, and the importance of vulnerable groups. But some differences were noted, and these are set out in the table below.

The Netherlands	The UK
More comments on growing nationalism and populist policies	No comments on this
More decentralised government	Less decentralised government, but devolved national administrations are important
Ease of connection to trans-European energy networks	Brexit dislocates from European thinking and resources
More comments on transportation – especially walking and cycling	Fewer comments
Flexible workers mentioned as a vulnerable group in all Dutch interviews	Fewer comments on this
More comments on the need for fiscal reform	More comments on the need for better Government communication
Less supportive and more questioning on hydrogen	More supportive comments on hydrogen

During the conduct of the project, the idea emerged to not only produce recommendations for action to deliver a just energy transition in a post-COVID environment, but also to use the Round 2 interviews to prioritise the draft recommendations. The results have been described earlier in this section and we conclude this was a most worthwhile activity. It shows important differences of perspective between the two nations, and between the various social actors. Further, it could allow future research to be conducted - in due course - to address the changing perceptions of these interviewees, or to extend the model to comparisons with other countries.

In considering further research activity, one chance remark by a UK industry interviewee – about an international index for a country's energy transition – led to some exploratory research by members of the team. This has been described in Annex III of this report and is considered as an area of significant future potential.

The research team would like to record its thanks to the Dutch Research Council NWO for funding this 6-month project, which we trust makes a valuable contribution to a rapidly evolving scene. The results are to be promulgated in various ways: the full report and Executive Summary will be sent to all interviewees; shorter articles are already in preparation for publication; and the coding of the detailed transcripts will allow the preparation of academic papers of this work over the next year.

INTERVIEW SCHEDULE

Appendix I

	Netherlands		UK	R1 = round 1	R2 = round 2

Government		**Industry**		**Third sector**	
Env Ministry	*R1 and R2*	Shell NL	*2 (R1)*	Jester	*R1 and R2*
Env Ministry	*R1*	National grid	*R1*	Enver	*R1 and R2*
Rotterdam municipality	*3 (R1 and R2)*	Shell UK	*R1 and R2*	Laks	*R1 and R2*
STT	*R1 and R2*	Scottish Renewables	*R1 and R2*	TNI	*2 (R1 and R2)*
PBL	*R1 and R2*	SHFCA	*R1 and R2*	Future Motions	*R1 and R2*
TNO	*R1 and R2*	Energise	*R1 and R2*	Milieu defensie	*R1*
Scottish Government	*R1 and R2*	Co-op Power	*R1 and R2*	ALL union	*R1*
NI Government	*2 (R1 and R2)*	Delta - EE	*R1 and R2*	Salford University	*R1 and R2*
Aberdeen Council	*R1 and R2*	Financial Investor	*R1 and R2*	UNISON	*R1 and R2*
		The ADE	*R1 and R2*		

Total R1 = 18 NL + 15 UK = 33 Total R2 = 13 NL + 14 UK = 27

Total NL (R1+R2) = 31 Total UK (R1 +R2) = 29

Total Government = 23 Total industry = 19 Total third sector = 18

Grand total = R1 + R2 = NL + UK = Govt + industry + third sector = 60

APPENDIX II INTERNATIONAL OBSERVATIONS

Introduction

One additional question was added to most of the first round of interviews (26), seeking the views of interviewees on international aspects of the current crisis. (The question was not asked in 4 interviews due to either a lack of time or a poor technical connection.) The question had not been included in the pre-interview information pack, and so it was interesting to hear the variety of views expressed. The discussion addressed the subject from the viewpoints of both the EU and of the developing world.

The question generated a total of 38 observations, divided between 13 relating to the EU and 25 relating to the developing world. These were derived almost equally from the two countries – NL 20 and UK 18. The observations were also divided roughly equally between governmental, industrial and third sector groupings, with the curious anomaly that no comments were received on this subject from the UK government interviews.

On the developing world comments, two should perhaps be mentioned at the outset, reinforcing the value of asking this additional question. A Dutch government interviewee recorded that "It's a very relevant question and it's really good you ask it." And a Dutch third sector representative commented as follows: "The developing world is much more important than what is happening in the Netherlands."

As with the previous sections of this report, the observations are categorised into sub-divisions in chart A-II.1 below.

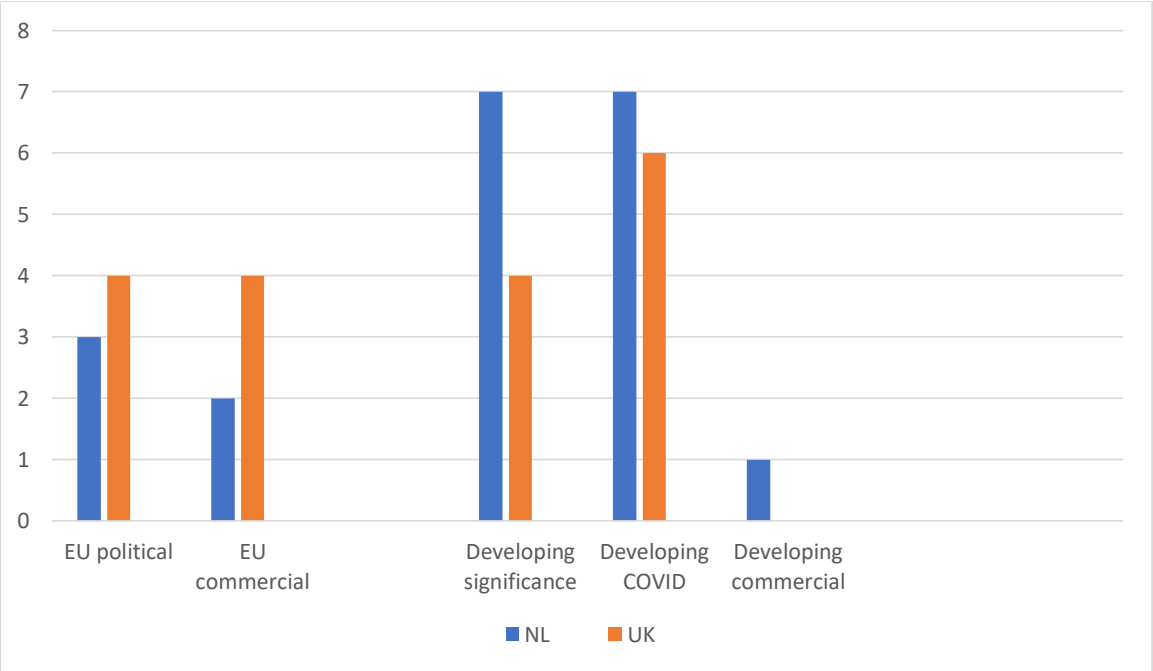


Chart A-II.1 Distribution of observations on international aspects

These sub-divisions are addressed in turn in the following sub-sections.

EU - political

Several interviewees expressed views on whether the international trend was towards greater global co-operation or towards greater isolationism. These views all favoured a global approach but recognised that the current trend was in the opposite direction. One UK industry interviewee identified the potential benefit of a Just Transition Country Index (JTCI), and that interesting suggestion has been addressed further in the following Appendix III of this report. A Dutch government interviewee considered that greater isolationism could reduce the need to transport goods between countries. They considered also that the EU was faster at making proposals than member states.

EU – commercial

Representatives from both countries identified that commercial opportunities could arise in the EU from new investment in green infrastructure. A UK industry interviewee pointed to forthcoming investments in Germany, Denmark, and the Netherlands, and another confirmed they were tracking EU markets. One advised that their organisation was lobbying the Scottish government to develop an international export strategy for green skills. A Dutch government representative also remarked that neighbouring European markets would be an opportunity for Dutch industry. One Dutch industry observation considered however that there was a question mark over the EU climate change plans for 2030.

Developing world – significance

Most observations on this aspect described the developing world as suffering at the forefront of climate change, and efforts were needed to accelerate remedial action here. A UK third sector representative considered that the developed world had exploited the developing world for its resources for so many years. A UK industry observation noted that the developed world has a responsibility to act: “we must rethink this – there is a moral hole in our system”. Two industry interviewees – one NL and one UK – questioned whether China, India, and Brazil were really developing countries. A Dutch third sector observation noted that the developing world was characterised by poverty and high population density, although another noted that some such countries - for example Uganda - have a low population density. Another Dutch third sector commentator advised that democracies are more difficult to control, especially “difficult, individualistic, anti-authoritarian Dutch people”.

Developing world – COVID

On COVID, several comments noted that the impact of the virus was greater in the southern hemisphere, and that the virus was making existing problems such as hunger worse. The phrase “humanitarian crisis” was used by a Dutch government interviewee. One UK industry commentator noted that there were no safety nets in the developing world and so people had to go out to work, which would lead to greater fatality rates. They noted that this could lead to the creation of herd immunity.

Several interviewees noted the absence of robust healthcare systems in the developing world. But one Dutch industry interviewee advised that a relation working in the healthcare sector in

Zambia had said that “COVID is the least of our problems”. Another considered that African states had valuable experience of dealing with other viruses such as Ebola.

Developing world - commercial

Only one interviewee – from the Dutch government – commented on the commercial impact on the developing world, but the point is important. He advised that there would be significant loss of income in the developing world due to a recession in the developed world, and this would only increase existing inequalities.

APPENDIX III A JUST TRANSITION COUNTRY INDEX (JTCI)

Introduction

In one of the first interviews – with an industry organisation in the UK – a seemingly passing remark raised the question of whether there was a system in place in which to gauge the extent which an individual country was implementing a Just Transition. That simple question has led the team to propose and consider the development of a Just Transition Country Index (JTCI). Such an Index could be significant in communicating the nature of a Just Transition, illustrating how it varies between countries, and explaining how it varies over time.

The concept seeks to combine already existing and internationally recognised global data from the related twin fields of energy transition and energy justice.

Data sources on energy transition

The primary source used for country data on energy transition is the *Energy Progress Report* prepared under the *Tracking SDG7* initiative operated jointly by the International Energy Agency (IEA), the International Renewable Energy Agency (IRENA), the United Nations Statistics Division (UNSD), the World Bank (WB) and the World Health Organisation (WHO). It gathers data from the SDG7 Technical Advisory Group, which comprises 30 organisations around the world.

Four targets are measured to indicate progress with the energy transition – in the table below. It will be noted that each has natural sponsors from within the main partners, and that the first two mentioned are more relevant to developing countries than to developed countries. Data is available from 1990.

% of population with access to electricity	WB
% of population with access to clean cooking	WHO
% annual growth in energy consumption	IEA/UNSD
% of total energy produced from renewables	IRENA/IEA/UNSD

Chart A-III.1 International measures of energy transition

Energy justice

While some of these measures imply the improvement of social justice – for example, universal access to electricity would seem to indicate a fair approach to energy distribution – this is not necessarily so for all measures. For example, it would also be possible to move fossil production to renewable production without necessarily improving the social justice in a country. Equally,

bringing down the growth in fuel consumption need not improve social justice, and could indeed make matters worse for vulnerable groups. So, other measures are required to assess the social justice implications of an energy transition.

Data source on energy justice

There is no measure which can chart the level of energy justice in a country, and one must look for existing proxy measures which can approximate to such a data source. One possible candidate is the well-known Gini coefficient, which measures statistically the degree of inequality in a country. This data has been assessed globally, to a standard format, for a significant time. It is not specifically aimed at energy inequality, but at the same time, it is a broad-brush indicator of a lack of social justice. Other proxy data sources may exist to provide further insights.

Graphical representation

The graphical representations on the following pages may be explained as follows. They show a plot of the Net Zero target for the Netherlands and the UK. The above four measures of energy transition are set out on 4 intersecting axes - each expressed in the form that 0% is the ultimate policy target. Some of the measures are therefore expressed as the inverse of the SDG7 target, in other words:

% of population without access to electricity
% of population without access to clean cooking
% of total energy still produced from fossil fuels
% annual energy growth /double the global average of annual energy growth

Chart A-III.2 Measures of energy transition where zero is the target value

The plotting of the four data points for a country provides a quadrilateral the area of which indicates the scale of challenge remaining to achieve net zero – which is the centre of the graph. To this basic plot is then added the Gini reading for that country, recorded as a point on the orange inclined axis. Here the target again is to reach zero, although that is a significant challenge – no country has achieved less than 23% to date.

Three graphs are included. They are – for the purpose of this report – obviously, the Netherlands and the UK. It will be noted that the two countries are almost the same in this analysis. A graph for a third country – South Sudan – has also been included for comparison with a less developed country in Africa.

Initial results

Data is available for 150 countries. The table below shows a sample of initial results.

Achieving a value of zero would indicate perfectly just energy transition.

Country	Netherlands	UK	US	China	India	South Sudan
JTCI	1.60	1.50	1.86	2.30	2.01	3.05

Further research

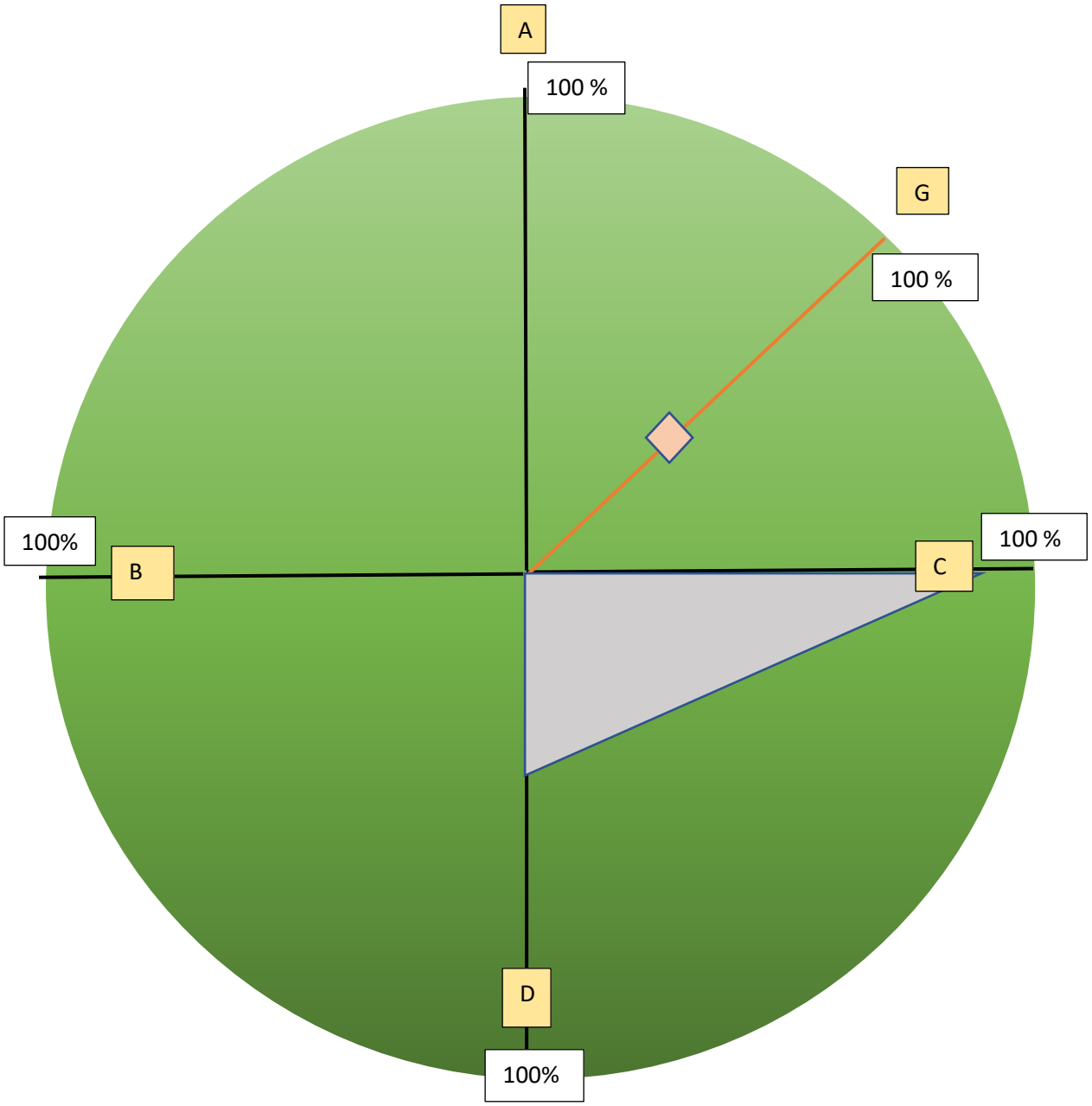
It is planned to extend this preliminary work to address the following issues:

(a) The variation of the JTCI over time – as mentioned above, data is available back to 1990. This could lead to differentiating between country performance in terms of speed of transition and examining the effect of major shocks such as the financial crash of 2008 and the COVID pandemic of 2020.

(b) The correlation between the JTCI and GDP.

(c) The correlation between JTCI and country population.

JUST TRANSITION COUNTRY INDEX **NETHERLANDS**



A % without electricity

B % without clean cooking

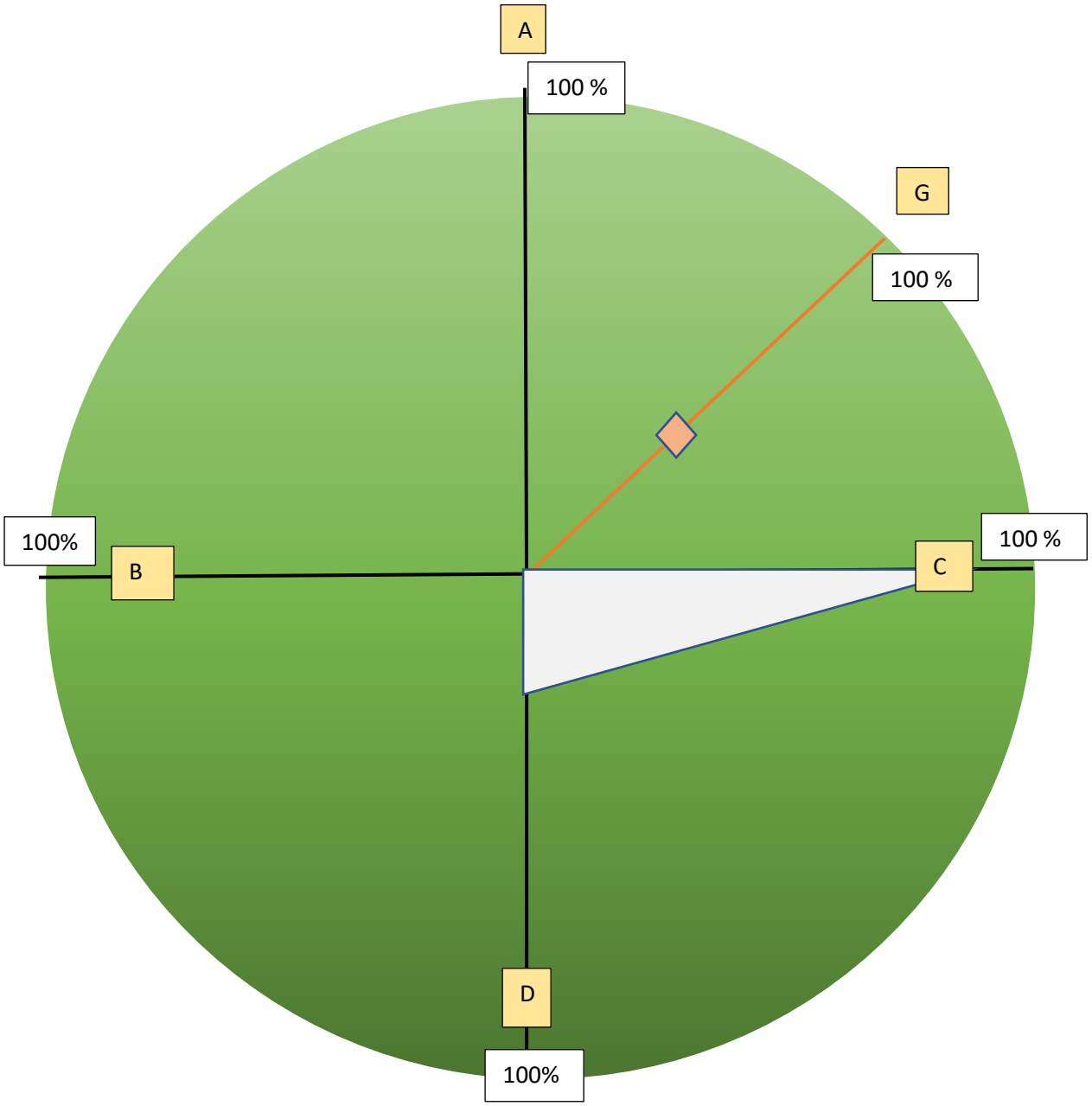
C % of energy from fossil fuels

D 0.5 (annual energy growth/international average) (%)

G Gini coefficient (%)

JTCI = A + B + C + D + G= 0 + 0 + 0.93 + 0.37 + 0.30 = **1.60**

JUST TRANSITION COUNTRY INDEX **UK**



A % without electricity

B % without clean cooking

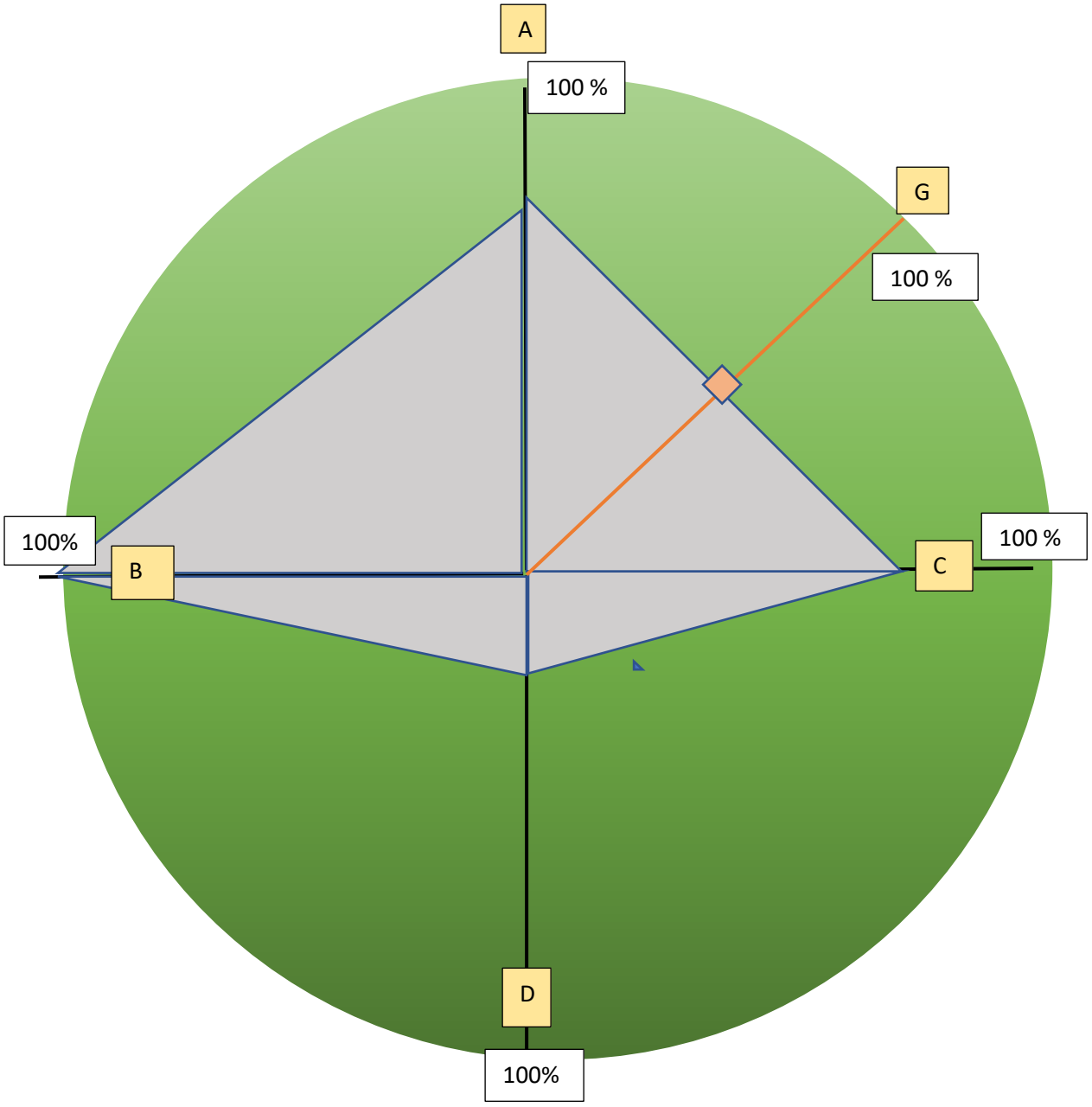
C % of energy from fossil fuels

D 0.5 (annual energy growth/international average) (%)

G Gini coefficient (%)

JTCI = A + B + C + D + G = 0 + 0 + 0.9 + 0.28 + 0.32 = **1.50**

JUST TRANSITION COUNTRY INDEX **SOUTH SUDAN**



A % without electricity

B % without clean cooking

C % of energy from fossil fuels

D 0.5 (annual energy growth/international average) (%)

G Gini coefficient (%)

JTCI =A + B + C + D + G= 0.72 + 1.0 + 0.72 + 0.15 + 0.46 = **3.05**