

‘Building Back Better’: Social Justice in the Green Economy

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I. Introduction

The Covid-19 pandemic has caused the worst economic downturn since the Great Depression. At the time of writing, the latest projections from the International Monetary Fund (IMF) are that global GDP shall contract by -4.9% in 2020, with strong variations between countries (from an average of -8.0% for advanced economies to -3.0% for emerging market and developing countries, and -1.0% for the least developed countries).¹ While China's economy is projected to still grow by 1.0%, the economies of India, South Africa, Brazil and Mexico are expected to contract respectively by 4.5%, 8.0%, 9.1% and 10.5%. Although the contraction of the economy will be more severe in rich countries, it is low-income countries that are the most vulnerable, since they face a number of interrelated shocks: in addition to the supply shock resulting from the measures adopted to face the pandemic, these countries face a fall in commodity prices on which they often depend for their export revenues; they struggle with high levels of external debt, the weight of which increased as a result of capital flight and the loss of value of their currencies in comparison to the currencies in which their debt is labelled; and the levels of remittances from migrant workers has fallen by about one fifth in comparison to earlier periods. For all these reasons, low-income countries are the least able to provide support to enterprises affected by the economic crisis, and to expand social protection, or put in place new social protection schemes, to shield their population from the social impacts of the crisis.

The employment impacts of the crisis are significant: the decline in work hours in the first trimester of 2020 represents the equivalent of 130 million full-time jobs, and the decline in the second semester represents 305 million full-time jobs.² The worst hit are the low-skilled workers employed in occupations that cannot be performed from home, migrant workers cut off from social and family solidarity networks, and workers in the informal sector (1.6 billion globally) and in precarious forms of employment (0.4 billion). Because women are over-represented in the most affected categories and because they shoulder most of the burden when families have to make up for the inability of public services, including healthcare services, to

support those in need of care, the crisis also represents a massive setback in the progress towards gender equality. Extreme poverty shall rise significantly as a result: based on a poverty baseline of 3.20 USD/day in PPP), 176 million more people shall fall below subsistence levels as a result of the crisis.³

Against this background, the adoption of pro-poor macro-economic and fiscal policies and the strengthening of social protection are more essential than ever. As the Secretary-General observed in his message for International Mother Earth Day however, while the impact of the coronavirus "is both immediate and dreadful [...], there is another deep emergency — the planet's unfolding environmental crisis". It is this more complex equation that this paper seeks to address.⁴ It argues that there is no tradeoff between social justice, including both poverty eradication and the reduction of inequalities, on the one hand, and accelerating the transformation towards low-carbon and biodiverse societies on the other hand: it is by combining the two that we can maximize our chances of achieving both.

Scientists have repeatedly warned about the urgency of the environmental crisis. In 2019, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) warned that "While more food, energy and materials than ever before are now being supplied to people in most places, this is increasingly at the expense of nature's ability to provide such contributions in the future, and frequently undermines nature's many other contributions, which range from water quality regulation to sense of place. The biosphere, upon which humanity as a whole depends, is being altered to an unparalleled degree across all spatial scales. Biodiversity – the diversity within species, between species and of ecosystems – is declining faster than at any time in human history".⁵ The report finds that around one million animal and plant species are now threatened with extinction, more than ever before in human history. At the same time, the volume of greenhouse gases (GHG) emitted into the atmosphere has doubled since 1980, raising average global temperatures by at least 0.7 degrees Celsius. Using the World Meteorological Organisation's definition of global average surface temperature, and the late 19th century to represent its pre-industrial level, the Inter-Governmental Panel on Climate Change (IPCC) warns that we just passed 1°C and that the heating of the planet is accelerating to reach more than 0.2°C per decade, which would take us to a 1.5°C increase around 2040. The special IPCC report published in October 2018 concludes that we must reverse these trends before 2030 if we are to avoid reaching tipping points that will accelerate climate change through a number of positive feedback loops, which could lead us to slide into chaos.⁶ Climate disruptions are already being felt in many regions, with important impacts on human rights.⁷

Low-income households must be shielded from the economic crisis. But they must also be protected from the threats facing the ecosystems. People in poverty, among which minority groups are overrepresented, are the first victims of air pollution, and the most at risk from landslides or flooding, because they are forced to live wherever they can afford housing.⁸ As noted by the Chennai Guidance for the integration of biodiversity and poverty eradication⁹, they are also, more than others, dependent on the ecosystems for their livelihoods¹⁰: globally, 1.2 billion jobs (40 per cent of total world employment), most of which are in Africa and Asia and

the Pacific, rely directly on the effective management and sustainability of a healthy environment.¹¹ People in poverty, including the 476 million indigenous people¹², are therefore the most affected by climate disruptions.¹³

Since the start of the Covid-19 pandemic, governments have injected at least 11 trillion USD in the economy in rescue plans and to spur the recovery. This unprecedented effort, which dwarfs those that followed the 2008-9 financial crisis, is vital to mitigate the economic and social impacts of the pandemic. The answer to the crisis, however, cannot consist simply in the adoption of economic recovery programs that stimulate growth, in the hope that more wealth creation shall allow for the adoption of redistributive social policies and the financing of environmental measures. 20th-century thinking saw growth as a pre-condition for both the reduction of inequalities and the eradication of poverty, and the wiping out of environmental damage¹⁴. We now require something else: a development model that takes seriously the interrelated challenges of poverty eradication and environmental sustainability, by incorporating these concerns in the model of growth itself, rather than seeing them as an afterthought or a hoped-for byproduct. The adoption of economic recovery plans by governments in all world regions provides a once-in-a-lifetime opportunity to make this transformation happen.¹⁵

The objectives of poverty eradication and the reduction of inequalities, on the one hand, of moving towards sustainable consumption and production and acting decisively on biodiversity loss and on climate change, on the other hand, can and should be considered together, to guide recovery policies. This integrated approach is at the heart of the UN's 2030 Agenda for Sustainable Development.¹⁶ Following the Covid-19 crisis, it is this approach that should guide governments to "build back better".

An essential dimension of the "Just Transition" is to cushion the impacts of the ecological transformation for the workers and communities affected (II). That alone is insufficient, however. In specific areas such as energy, building, food and mobility, "triple dividend" actions can be taken -- reducing the ecological footprint, while at the same time creating employment opportunities for people with low levels of qualification and facilitating access to goods and services essential to the enjoyment of human rights (III). We conclude that, under certain conditions, the greening of the economy can contribute to social justice, both by its job-creation potential and by other means: it can help to combat energy poverty, reduce the energy bills of poor households, ensure healthy diets are more affordable to them, and improve access to mobility (IV).

II. Protecting those affected by the transformation towards a low-carbon economy

In the Paris Agreement adopted on 12 December 2015 at the 21st Conference of Parties to the United National Framework Convention on Climate Change¹⁷, States parties pledged to "Tak[e] into account the imperatives of a just transition of the workforce and the creation of decent work and quality jobs in accordance with nationally defined development priorities".¹⁸ Workers and communities affected by the shift away from fossil energy production and use, as well as, more

generally, by the transformation towards low-carbon and biodiverse societies, should be protected not only by social protection -- including unemployment benefits --¹⁹, but also by programs including appropriate reskilling, training and the provision of assistance for job seekers, and investments in the regions concerned to create new economic opportunities.²⁰

In a scenario in which the increase in global average temperature is limited to 2°C above pre-industrial levels, some 24 million new jobs can be created, more than compensating the 6 million jobs that might be lost, particularly in the fossil energy sector.²¹ As confirmed by a review of 30 studies covering various individual countries and economic regions, there are potentially real benefits from the ecological transition in terms of jobs creation.²² A greener economy can bring forth employment opportunities. However, despite an overall positive impact on employment, the transition shall cause inevitable job losses in certain carbon and resource-intensive industries, and the impacts of climate mitigation policies shall vary from region to region. This requires that climate action go hand in hand with investments in the new sectors that shall emerge and in the training of workforce,²³ as well as with a strengthening of social dialogue to ensure that the transition does not negatively impact workers²⁴, in accordance with the 2015 ILO *Guidelines for a just transition towards environmentally sustainable economies and societies for all*²⁵ and the 2016 UNFCCC guidelines *Just Transition of the Workforce, and the Creation of Decent Work and Quality Jobs*.²⁶ More specifically, four policy tools allow to maximize the synergies between social protection and environmental sustainability to cushion the social costs of the transition to a greener economy: skills development programmes, public employment programmes, payments for ecosystem services and cash transfer programmes.

First, reskilling programs are essential, not least since carbon-intensive industries employ mostly low-skilled workers.²⁷ These programs are designed to help workers shift from declining resource-intensive sectors to growing low-carbon industries, as well as to transform existing occupations towards green practices. In this context, governments, workers representatives and employers should work together to pursue two objectives: (1) identify early potential job losses in emitting industries and (2) propose skills upgrading and training to workers of those industries, either to adapt their skills to new green technologies or to move to green industries. To ensure equal access to skills acquisition, young people, women and low-skilled workers should receive targeted assistance through tailor-made courses directly linked to specific job openings, in order to identify their skills deficiencies and ensure their access to green jobs. While this is important in all regions, it is especially crucial for the Middle East and Africa, which rely most heavily on fossil fuels and where the industries that will grow in the ecological transition are currently less developed.

Cross-country comparisons provide an important source of inspiration as to how reskilling programmes can benefit from alliances between workers, employers and governments.²⁸ The Green Jobs Act (GJA) in the Philippines aims to identify skills needs, maintaining a database of green careers, and encouraging training *inter alia* by fiscal incentives to enterprises.²⁹ Trade unions themselves can contribute to reskilling, as is the case with the Argentinean construction workers' union (UOCRA) that provides training for workers in the field of renewable energies.³⁰

Second, public employment programs can also play a key role in this regard, since they provide employment opportunities for workers affected by the transition and training, and can also serve to improve infrastructures for climate mitigation and resilience: the Mahatma Gandhi National Rural Employment Guarantee Act (MGNREGA) in India, the Working for Water programme in South Africa or the Productive Safety Net Programme in Ethiopia, are examples. In France, the social initiative "Zero long-term unemployment territories" set up by several organizations in collaboration with local public authorities offers a permanent position to anybody in long-term unemployment who wishes to find a job. This is done by developing and financing socially and environmentally useful activities to meet the needs of the given territory.³¹

Thirdly, the payment for ecosystem services (PES), to reward communities who maintain healthy ecosystems, can be part of such "Just Transition" plans. The "Bolsa Verde" program in Brazil is perhaps the best-known example, but other similar experiences exist in different world regions.³² It should be ensured however that people in poverty (landless poor and smallholders) are not excluded from PES which may require formal land title, minimal land size or expensive application processes³³: programmes financed by governments and non-profit organizations have been shown to be more pro-poor in this regard than privately funded schemes.³⁴

Finally, cash transfer programmes can compensate for the loss of income experienced by households, resulting from the implementation of green policies. These programmes are of paramount importance in developing countries where social protection (such as unemployment schemes) are non-existent or weak.³⁵ In 2013 for example, the Egyptian government combined the reduction of fossil fuels subsidies with the launch of two new cash transfer programmes to help offset the impact of substantial fuel price increases on poor and vulnerable households. The programmes covered about 1.5 million families (6 million Egyptians).³⁶

Such reskilling, public employment programmes, as well as PES systems and cash transfer programmes, should adopt a gender-sensitive approach to ensure that women benefit from the transformations of the world of work in the greening of the economy.³⁷ While women are particularly at risk since they are overrepresented in the occupations that shall be most affected by climate shocks and in the informal sector, the transition can also be seen as an opportunity to close the gender gap, for instance by focusing training efforts on women, by formalizing jobs occupied by women in the agricultural and forestry sectors or by advancing the traditional and local knowledge of indigenous women, which is already playing a key role in strengthening climate action.³⁸ Similarly, including persons with disabilities in the design and decision-making processes of new low-carbon sectors will lead to increased integration of universal access and universal design principles and contribute to designing inclusive societies for all.³⁹ In that sense too, the greening of the economy may be seen as a chance to move towards a more inclusive world of work.

Achieving a just transition scenario requires not only to provide employment gains (in quantitative terms) but also to ensure that the jobs created are "decent", in the specific meaning given to this term in international human rights law: green jobs must respect labour rights, provide adequate income, sufficient social protection, safe working conditions and effective social dialogue.⁴⁰ Occupational hazards generally decrease as a result of the transition towards a low-carbon economy⁴¹: the ILO considers that "there is no question that switching from fossil fuels to renewables entails a vast improvement in the occupational health situation", especially

in coal mining, one of the most hazardous industries for workers in terms of long-term health and exposure to accidents.⁴² The World Health Organization also notes that the manufacture and use of “green” chemicals, i.e. safer for human health and the environment, may provide many opportunities to improve health and safety at work.⁴³ Green jobs however also may pose new risks⁴⁴: the toxic substances contained in solar panels, for instance, may present risks for workers during their manufacturing and installation.⁴⁵ While a green economy is very likely to be healthier and safer both for workers and the public, a robust regulatory framework should therefore be put in place to prevent possible new occupational hazards.⁴⁶

Considering benefits, moreover -- on work security and wages in particular--, the evidence is mixed. The OECD considers that the new green jobs are generally of lower quality, in the sense that some dimensions (most notably job security) are frequently weakened for workers⁴⁷; and some studies analyzing the variation in a range of benefits resulting from a transition towards green jobs in three countries (Australia, France and Korea) found decreased job quality in terms of working conditions.⁴⁸ By contrast, the ILO reviews current evidence to suggest that green jobs tend “to be more qualified, safer and better paid than comparable jobs in the same or similar sectors”.⁴⁹ Research in Germany and Spain found that jobs in renewables are overwhelmingly permanent, full-time positions, with only a small share of temporary positions.⁵⁰ Similarly, in China, workers at wind farms had higher average annual incomes and better job security, experienced better occupational conditions and enjoyed a higher level of workplace protection measures than their counterparts in conventional power plants.⁵¹ There is no automatic relationship, however, between greening the economy and the creation of high-quality jobs⁵², and therefore measures are necessary to ensure that the ecological transition improves rather than degrades working conditions, especially for women and low-skilled workers.

III. Triple-dividend actions: reducing poverty within planetary boundaries

Such compensatory measures as outlined above are important. But reconciling poverty eradication with the ecological transformation demands more: it requires that, in the design of the ecological transformation itself, we explore the synergies between that aim and poverty eradication in key sectors such as energy, mobility, food and building. Such synergies result both from the new employment opportunities arising from the ecological transition, and from policies that ensure that the most sustainable consumption choices are also the easiest to make and the most affordable for consumers. The following sections identify the pathways that could be followed to that effect. They highlight a range of “triple dividend” actions that could be taken: actions that contribute to the transformation towards low-carbon and biodiverse societies, while at the same time creating employment opportunities for people in poverty and improving their access to the goods and services essential to the enjoyment of human rights.

1. Energy

Energy production and use is the largest source of global greenhouse-gas (GHG) emissions⁵³, and energy-related carbon dioxide (CO₂) emissions have increased by an average of 1.3% annually over the last five years, widening the gap between actual emissions and the reductions required in order to remain on the track set by the 2015 Paris Agreement.⁵⁴

There is a gradual shift from fossil fuels to low-carbon energy supply derived from renewable sources. Globally, the share of renewables has increased from 16.6% in 2010 to 17.5% in 2016⁵⁵, and the share of modern renewables (excluding the traditional use of biomass, for cooking in particular, which is associated with significant negative health impacts) has increased from 8.6% to 10.2% in the same period.⁵⁶ But progress is uneven. The use of renewables grew fastest with respect to electricity production, driven by the rapid expansion of wind and solar technologies, a development particularly due to China's record-level wind capacity growth and rapid solar capacity expansion in both China and the United States. As regards heat production, while 24% of heat generated in 2016 was sourced from renewable energy, more than half of this total comes from traditional uses of biomass.⁵⁷ And the share of renewable energy in transport remains extremely low: it reached 3.3% in 2016⁵⁸, and even so, the sustainability of this development remains highly questionable, since it relies mostly on the expanded use of biofuels, driven by support policies in the United States, Brazil, and the European Union, implying highly unsustainable indirect land use changes. In the future, the most significant potential for GHG emissions-reduction resides in increasingly electrified forms of transport and heat, combined with increases in renewable power generation: this could represent up to 60% of energy-related CO₂ emissions reductions needed to meet the objectives of the Paris Agreement.⁵⁹ While this will require significant additional investments (from the anticipated USD 95 trillion over the period 2020-2050 to 110 trillion, meaning a 16% increase in investments⁶⁰), the savings from avoided subsidies and reduced environmental and health damages are about three to seven times larger than the additional energy system costs: in other terms, for each US dollar spent, the payoff would be between 3 to 7 dollars.⁶¹

Especially in rural areas, where large-scale on-grid energy production are not cost effective, decentralized energy production has a particularly important potential, both because it creates employment and because it allows for greater participation of local communities, ensuring that the needs of low-income households are better taken into account.⁶² While promoted for instance by the Least-Developed Countries under the Renewable Energy and Energy Efficiency Initiative (REEEI),⁶³ such decentralized solutions may be adapted to the situation of countries at different levels of development. In France, local organizations called "Centrales Villageoises" have been created to foster renewable energies on a territory by involving citizens, communities and local businesses.⁶⁴ In India, the "Pollinate Group" relies on a social business model to distribute solar lights in poor households, allowing them to achieve significant financial savings and to move away from highly polluting kerosene-based equipment, at the same time training women entrepreneurs.⁶⁵

Progress is also too slow concerning the energy efficiency in comparison to the SDGs target 7.3 of a 2.6% rate of improvement in energy efficiency. A major accelerator of this transformation would be to ensure energy efficient solutions are more affordable, and thus more widely adopted by low-income households: in the United Kingdom for instance, the Energy Company Obligation programme combats energy poverty and supports energy efficiency through subsidies for insulation projects of vulnerable households, reducing their energy

expenses⁶⁶; in Poland's "Clean Air" (PCP) programme, low-income households have access to co-financing to invest in improved energy efficiency, at much more favourable conditions than higher-income households. Where energy efficient solutions allow to make savings in the long run but impose higher investment costs, providing consumers with information about energy performance, the use of performance rating tools, or "third-party investor" systems, in which an investor meets the initial costs and is compensated by receiving a portion of the savings on the energy bill, may also be explored.

The energy transition outlined above can be an important source of employment creation. Though the energy sector is a relatively small employer⁶⁷, the transition has a strong job-creation potential: between 2012 and 2016, the number of people directly and indirectly employed in the renewable energy sector (excluding large hydropower) rose from 5.7 million to 8.3 million⁶⁸, a figure which could increase further to 25 million by 2030 with proper policy support. This would offset the job destruction in carbon-intensive industries, since renewable energy is more labour intensive than fossil-based energy: solar electricity, for example, requires 0.87 total person years for each GWh of electricity generated while electricity from coal or natural gas requires 0.11.⁶⁹ Per dollar of expenditure, spending on renewable energy will produce nearly 70 per cent more jobs than spending on fossil fuels.⁷⁰ As a result, net employment gains in renewable-based electricity are estimated at some 2.5 million jobs, offsetting employment losses of around 400,000 jobs in fossil fuel-based electricity generation.⁷¹ Similarly, measures to improve energy efficiency have an important job-creation potential: each US\$ 1 million spent in improved energy efficiency supports 7.72 jobs, while similar investments in the renewable and fossil fuel sectors create 7.49 and 2.65 jobs, respectively.⁷² Jobs in the renewable energy industry are also of better quality than those in the fossil fuel industry⁷³, and women are better represented.⁷⁴

The transition to renewables can be designed in order to support poverty eradication and to combat social exclusion, through both employment effects and improved access to energy. Training programs could target in particular low-skilled workers or skilled workers from industries that experience job losses resulting from the energy transition⁷⁵: worker retraining and education investment are among the main policies that could both have strong economic multiplier effects and contribute to mitigating climate change.⁷⁶ Long-term commitments by States to electrify transport and heating systems, combining taxes and subsidies to favor the switch, can make access to such systems affordable for low-income households, as illustrated by the successful penetration of electrical vehicles in Norway.⁷⁷ The greening of energy can also lead to provide additional income to rural households, as in "solar double cropping",⁷⁸ where solar panels are spaced out and placed at a height allowing the land underneath to be used for agricultural purposes while also reducing irrigation needs.⁷⁹

The efforts to move towards sustainable energy provision thus can go hand in hand with efforts to ensure universal access to affordable, reliable and modern energy services, in accordance with target 7.1 of the SDGs. A large number of households still do not have access to affordable modern energy services, especially in rural communities⁸⁰: in 2017, 840 million people did not

have access to electricity (in comparison with 1.2 billion in 2010),⁸¹ and 3 billion people still lack access to clean-cooking solutions and are exposed to dangerous levels of air pollution, causing millions of deaths each year, mostly among women and children.⁸² The sub-Saharan African region remains the area experiencing the biggest deficit of access to affordable modern energy: 573 million people—more than one in two—lack access to electricity.⁸³ A projected 650 million people are likely to remain without access to electricity in 2030, and 9 out of 10 of these will be in sub-Saharan Africa.⁸⁴

The shift to a decarbonized energy system can be combined with meeting this challenge, and accelerating progress towards universal access to energy. All 34 OECD countries have seen a positive impact of an increased share of renewable energy on the retail price of electricity.⁸⁵ The prices of electricity from renewable sources is now dropping due to the reduction of production costs of solar and wind power technologies, as well as the economies of scale achieved.⁸⁶ Measures to promote energy efficiency can lower the energy bills for people facing poverty, thus decreasing the environmental footprint of households while reducing energy poverty. Moreover, social tariffication schemes -- ensuring that the households that consume the least energy pay the least per kW consumed, or even that minimum amounts of energy per person are guaranteed free of charge -- can offset any short-term price impacts of the switch to renewables and protect low-income households from excessive price volatility and energy poverty.

2. Buildings

The built environment accounts for 40 percent of global energy use and 30 percent of energy-related greenhouse gas (GHG) emissions.⁸⁷ The sector provides enormous opportunities for energy savings⁸⁸, given the generally low energy performance of existing buildings and the speed of urbanization in developing countries: with the right policies and technologies, energy consumption in both new and existing buildings may be cut by 30 to 80 percent.⁸⁹ At the same time, for much of the world population, access to decent and safe housing remains a dream⁹⁰, with over 1 billion people living in slums in 2016.⁹¹ Promoting access to decent, well-insulated and energy-efficient housing can thus serve both to reduce greenhouse gas emissions and energy use and to ensure access to adequate housing, whilst combating energy poverty.

The greatest proportion of energy consumed in the building sector occurs during the buildings' operational phase, primarily through heating, ventilation and air conditioning.⁹² Such energy use is highly dependent on its residents' behaviour,⁹³ and various tools to influence such behaviour (such as information about the energy efficiency of appliances and buildings through labelling, information campaigns, “smart” metering systems or energy training programmes)⁹⁴ as well as more efficient household appliances and consumer electronics (responsible for over 40 percent of residential energy demand in wealthy countries⁹⁵) have a crucial role to play. The greatest potential however resides in improving the energy efficiency of buildings: imposing performance-based energy efficiency standards⁹⁶ can ensure that the market value of the

building shall integrate its energy performance, thus helping to offset the cost barriers of energy efficiency measures.

Smart taxation, loans and subsidies policies can help. While taxing household emissions in order to discourage the energy consumption would have regressive impacts and increase energy poverty,⁹⁷ other tools can play a role. Thus, in France, zero-rate eco-loans were introduced in 2009, supporting owners and landlords to finance energy-saving renovation in properties built before 1990.⁹⁸ However, specific efforts should be made to ensure that such incentives benefit low-income households the most.⁹⁹ Projects such as the *Habiter Mieux* programme in France¹⁰⁰ or the *Better Energy Warmer Homes* initiative in Ireland, seek to provide grants and loans to low-income households to improve their energy efficiency: in Ireland, more than 130,000 homeowners have benefited from the initiative since 2001,¹⁰¹ and in France, 83% of households participating in *Habiter Mieux* reported that they could not have invested in the energy efficiency improvements in the absence of the programme.¹⁰² Other, similar programmes include initiatives which fund the renovation of inferior-quality buildings purchased by low-income households as emergency housing.¹⁰³

Although the operational phase accounts for over 80 percent of GHG emissions from buildings, the remaining 20 percent includes the 'embodied energy consumption' required for the manufacturing and transport of construction materials, the construction process itself, as well as the maintenance and demolition of buildings. States can regulate the use of materials to avoid deforestation, reduce pollution and toxicity, protect human health, and decrease the “embodied” energy of buildings, whilst encouraging the use of locally available traditional materials, which often have a smaller ecological footprint in comparison with materials such as brick, concrete, aluminum, iron and steel.¹⁰⁴ Recycling used construction materials also provides a number of environmental and social advantages, as used in the *World Hands* project conducted in Juarez (Mexico) to build low-cost sustainable homes.¹⁰⁵ Cities and municipalities can lead by example in this area, in particular by building social housing and publicly-owned buildings using low-emissions materials, and by incorporating such requirements in public procurement policies.¹⁰⁶

Transforming the construction sector in order to mitigate climate change has a major job-creation potential. Approximately 111 million people – or 7% of the global workforce – work in the construction sector,¹⁰⁷ and three-quarters are in developing countries, where residential construction employs up to ten percent of the total labor force.¹⁰⁸ For low-skilled workers, there are real opportunities in the retrofitting of buildings, as well as in the building of affordable housing.¹⁰⁹ As a result of climate mitigation policies, the construction industry shall experience an increase in employment of 1.7 per cent (corresponding to a job creation of 9 million in the renewables and construction sectors combined).¹¹⁰ One study calculates that every US\$ 1 million invested in the construction sector creates close to 650 jobs in India, 200 in China, 160 in Brazil and in Indonesia, and 120 in the Russian Federation.¹¹¹ However, the construction sector remains largely male-dominated, requiring specific efforts to improve the gender balance.¹¹² In addition, green jobs are not necessarily decent jobs: construction workers are three to four times more likely than other workers to die from accidents at work in the developed

world. This emphasizes the need for additional policies to protect workers involved in the construction industry.¹¹³

Improving the energy efficiency of dwellings of low-income households helps reduce energy consumption, and thus energy expenditure.¹¹⁴ However, most low-income households do not own their home, and since the home-owners do not reap the benefits from improved energy performance of the dwellings, they may underinvest in energy measures,¹¹⁵ or if they do invest, increase the rent to repay the additional investments, making access to housing less affordable for people in poverty. This “split incentives” problem should be addressed by imposing on home-owners that they improve the energy performance of buildings, in combination with rental cap laws.¹¹⁶

3. Food

The agrifood sector is a major driver of biodiversity loss and of climate change. IPBES warned in 2019 that “[w]hile the value of agricultural crop production (\$2.6 trillion in 2016) has increased approximately threefold since 1970, [...] indicators of regulating contributions, such as soil organic carbon and pollinator diversity, have declined, indicating that gains in material contributions are often not sustainable”.¹¹⁷ Almost one quarter of the global land area is degraded, reducing productivity, and pollinator loss costs between \$235 billion and \$577 billion in reduced crop output.¹¹⁸ While farming itself contributes around 10–12 % of global greenhouse gas emissions (mainly from CH₄ and N₂O emissions),¹¹⁹ agriculture-driven deforestation adds a further 6 to 17%, and the food system as a whole contributes between 15 and 28 % to overall GHG emissions in developed countries, taking into account all stages in the supply chain, from agricultural production through processing, distribution, retailing, homefood preparation and waste.¹²⁰ Green revolution technologies and industrial food production have thus allowed impressive increases in food production per capita globally, but with high costs to the environment and to public health.¹²¹

The mechanisation of production, the development of global supply chains and economies of scale have allowed the increase of both the volumes of agricultural commodities produced and traded and the supply of processed foods, allowing more diversified diets for the wealthiest parts of the population in most world regions. This dominant approach has generally not benefited people in poverty, however. Poor rural households in many developing countries, who practice farming on a small scale, have been the most significantly affected by the pressures on land and on farmers' incomes that resulted from the green revolution: while competition for land and the costs of farming have increased, farmgate prices have generally declined, squeezing out of farming, or relegating to subsistence farming, the least competitive and land-poor farming households. And at the consumer end of the food chain, low-income families in high-income countries, for whom healthy diets are often unaffordable¹²², but also in most countries of Latin America and the Caribbean, eastern Europe and central and east Asia (China and Indonesia) are disproportionately affected by obesity and by the non-communicable diseases linked to the increased consumption of heavily processed foods and to the lack of

dietary diversity associated with industrial food systems.¹²³ This is one source of the intergenerational transmission of poverty in these countries, since children born from women with obesity are at greater risk of obesity and thus of discrimination in access to employment.¹²⁴

This too is an area in which triple dividends can be achieved, as more sustainable agricultural practices can also contribute to poverty reduction or to improving access of low-income households to adequate diets. Agroecology can contribute to climate change mitigation by reducing the use of external inputs that depend on fossil energy for their production and that result in important emissions of nitrous oxide and by preserving and enhancing soil health and agrobiodiversity, allowing soils to function as carbon sinks.¹²⁵

Beyond its agroenvironmental services, however, agroecology can also guarantee to the local communities adequate nutrition through the provision of diversified, safe, and balanced diets; and it can improve the incomes of small-scale farmers, particularly in developing countries, by lowering the costs of production and improving resilience of farming systems against weather-related events, including those linked to climate change. According to a recent study, agroecological farms currently generate income that are superior to those obtained in conventional farms¹²⁶. In addition, agroecology is more labor-intensive than industrial agriculture, providing more employment per hectare and thus supporting local economies.¹²⁷ It therefore appears that adopting practices that are beneficial for the enhancement of agrobiodiversity also demonstrates positive results in terms of economic returns and job creation. The challenge today is to accelerate the agroecological transition by providing the right set of incentives to farmers, while at the same time taking measures, including fiscal measures, to ensure that all households, including low-income households, have access to adequate diets -- not simply diets providing enough calories and safe to consume, but also healthy and diversified, mostly plant-based and relying on fresh and seasonal foods with minimal processing.

4. Mobility

Motorized transport, still heavily reliant on fossil fuels, is the second biggest source of CO₂ emissions after non-industrial electricity and heat production,¹²⁸ and has severe health consequences through air pollution and traffic congestion.¹²⁹ Overall, mobility represents between 20 and 30% of the environmental impact linked to household consumption, and this impact is growing.¹³⁰ But the main victims, people in low-income neighborhoods, are the least to be blamed: people in poverty suffer the most from the impacts of traffic pollution,¹³¹ yet the distance traveled increases with disposable income¹³², whether we consider the distance traveled by plane¹³³ or by car¹³⁴, respectively the first and second most GHG-emitting modes of transport.¹³⁵ Ironically, this paradox is only partially reduced by the fact that relatively poor households live at a distance from work and in locations poorly connected through public transportation services, obliging them to travel in private vehicles to work.¹³⁶ Indeed, the expected growth in the demand for passenger transport is such, especially regarding extra-urban journeys (i.e. international, between cities, within rural areas, between rural and urban areas),

that even taking into account technological improvements such as more efficient cars, worldwide transport CO₂ emissions shall still grow by 60% by 2050.¹³⁷

Three priority triple-dividend actions emerge. Territorial planning that reduces the distance between domicile and places of employment and education reduces the need for motorized transport, and prevents the spatial segregation of the socially disadvantaged.¹³⁸ The promotion of collective modes of transport, a mix of public transport and shared mobility, combined with restricting access or prohibiting cars in dense urban areas when collective transport can cater for the needs¹³⁹ -- a measure that appears fairer than e.g. congestion charges¹⁴⁰ -- can both reduce reliance on individual vehicles and ensure a right to mobility (and thus to education, employment and health services) for all. Finally, since, in a life-cycle approach, battery electric cars emit less GHGs than cars with an internal combustion engine using gasoline,¹⁴¹ the electric powering of vehicles could be promoted as a last resort, at least where electricity provision can be sourced from renewable sources and where strict environmental safeguards apply to battery production.¹⁴² Electric vehicles are not a solution for people in poverty, however, at least in the predictable future. There is moreover a risk that the promotion of electric vehicles shall perpetuate car-centric mobility at the expense of public transportation and additional urban green spaces, disproportionately affecting the livelihoods and well-being of those living in poverty.¹⁴³

In addition to improving access to services for people in poverty, often relegated in neighborhoods distant from the better-connected urban centers, investing in such measures can be an important source of green job creation. According to the International Labour Organization, the doubling of investments in public transport would generate a net gain of at least 2.5 million jobs worldwide, and at least 5 million jobs when considering the broader impact on other sectors of the economy.¹⁴⁴ While the automotive industry shall face job losses, new jobs would be created in public transportation services and in the manufacturing of the required infrastructure. Additionally, due to the cheaper cost of collective transport, the disposable income of households will increase, freeing up resources that could be spent elsewhere and leading to job creation in other sectors. Finally, between 8.5 and 10 million additional jobs could be created by investing in electric vehicles, due to the production and waste processing of cars and batteries, and the manufacturing of infrastructures needed for electricity generation and distribution.¹⁴⁵

IV. Conclusion

The Covid-19 pandemic provides a once-in-a-generation opportunity to redefine development trajectories in accordance with the SDGs. The economic recovery plans can help move to low-carbon and biodiverse economies, while at the same time creating employment opportunities for people with low levels of qualification and ensuring access to goods and services essential to the enjoyment of human rights. More precisely, this paper has highlighted how the greening of the economy can contribute to social justice, not only through its jobs-creation potential, but

also by helping to combat energy poverty, by reducing the energy bills of poor households, by ensuring healthy diets are more affordable to them, and by improving access to mobility.

There are therefore powerful arguments for investing in the green economy, and for focusing the economic recovery on such "triple-dividend" measures. Why, one may be tempted to ask, are governments still reluctant? The obstacles to change fall in two broad categories. First, important lock-ins exist at the socio-technical level.¹⁴⁶ Existing technologies are typically much more efficient and competitive than emerging alternatives. The established technologies, after all, have been expanding so as to be able to achieve economies of scale, and they have further strengthened their dominance thanks to various network effects.¹⁴⁷ The investments made in the past in these technologies are "sunk costs", which would be lost if the technologies and associated infrastructures are phased out too early, to be replaced by new, cleaner options. Moreover, those established technologies have gone hand in hand with lifestyle changes and routines -- for instance, reliance on the car for transport -- that cannot be easily changed, in particular due to what psychologists call the "endowment effect" -- the fact that we attach a higher value to what we already own than to the potential of future gains.¹⁴⁸ Secondly, political economy factors play an important role in explaining the inertia.¹⁴⁹ Incumbent actors typically are able to convert their economic dominance into political influence, in what the United Nations Conference on Trade and Development called the "revenge of the rentiers": the capture of State power by powerful economic actors, who use the State to further strengthen their domination.¹⁵⁰ Governments may fear that the imposition of stronger requirements on economic actors will hurt their ability to compete on global markets. Moreover, maintaining the statu quo is easier to justify, politically, than to impose disruptive changes that inevitably will result in certain people losing -- and not all of whom can be immediately compensated: workers, and indeed whole regions, may depend on the jobs and economic returns from the old technology, so that rapid change will meet with strong resistance, both from the corporate interests involved and from wider segments of society.

These multiple dividends shall not be reaped automatically, however. In order to maximize the potential of the green transition, the workers and communities affected by the ecological transformation should be protected from the impacts on their livelihoods, and significant investments should be made in areas such as energy, buildings, food and mobility, with the participation of the workers and communities concerned in order to ensure that the policies in place are informed by the obstacles each region faces and how such obstacles to the transition can best be overcome. Provided such participation is ensured and, more generally, provided the governance of the transition ensures that priority is given to reconciling social justice with the shift to a low-carbon economy respectful of biodiversity, we can capture the "triple dividend" of a cleaner environment, decent jobs, and affordable goods and services. "Building back better" does not mean a return to the *status quo*. It means the opposite: directing public action towards the eradication of poverty within planetary boundaries.

Notes

¹ IMF (2020) *World Economic Outlook Update : A Crisis Like No Other, An Uncertain Recovery* [online] <https://www.imf.org/en/Publications/WEO/Issues/2020/06/24/WEOUpdateJune2020> (accessed 3 July 2020).

² ILO Monitor (2020) *COVID-19 and the world of work*, 29 April, 3rd ed., [online] https://www.ilo.org/wcmsp5/groups/public/---dgreports/dcomm/documents/briefingnote/wcms_743146.pdf (accessed 13 June 2020).

³ Gerszon Mahler, D. et al. (2020) ‘Updated estimates of the impact of Covid-19 on global poverty’, *World Bank blogs*, 8 June.

⁴ This paper is based on the report prepared by Olivier De Schutter in his capacity as Special Rapporteur on extreme poverty and human rights for the 75th session of the UN General Assembly (UN doc. A/75/50338).

⁵ Plenary of the Intergovernmental Science Policy Platform on Biodiversity and Ecosystem Services (IPBES) (2019) *Summary for policymakers of the global assessment of biodiversity and ecosystem services*, 7th session (Paris, 27 April-4 May), IPBES/7/10/Add.1, p.3.

⁶ Intergovernmental Panel of Experts on Climate Change (2018), *IPCC Special Report on the impacts of global warming of 1.5°C above pre-industrial levels and related global greenhouse gas emission pathways, in the context of strengthening the global response to the threat of climate change, sustainable development, and efforts to eradicate poverty. Summary for Policymakers*.

⁷ See, in particular, Office of the High Commissioner for Human Rights (2017), Analytical study on the relationship between climate change and the full and effective enjoyment of the rights of the child (UN doc. A/HRC/35/13); Office of the High Commissioner for Human Rights (2016), Analytical study on the relationship between climate change and the human right of everyone to the enjoyment of the highest attainable standard of physical and mental health (UN doc. A/HRC/32/23); Office of the High Commissioner for Human Rights (2009), Report on the relationship between climate change and human rights (UN doc. A/HRC/10/61).

⁸ Bullard, R.D. et al. (2007) ‘Toxic Wastes and Race at Twenty 1987-2007: Grassroots Struggles to Dismantle Environmental Racism in the United States’, *United Church of Christ Justice and Witness Ministry*, Cleveland ; Morello-Frosch, R. et al. (2001) ‘Environmental justice and southern California's 'riskscape': the distribution of air toxics exposures and health risks among diverse communities’, in *Urban Affairs Rev.*, Vol. 36, No. 4, pp.551-578 ; Schweitzer, L. and Zhou, J. (2010) ‘Neighborhood air quality, respiratory health, and vulnerable populations in compact and sprawled regions’, in *Journal of the American Planning Association*, Vol. 76, No. 3, pp.363–371. In the United Kingdom, people living in the 10% of most deprived regions faced 41% higher levels of concentration of nitrous oxide from industrial activity and transport (Lucas, K. et al. (2004) *Environment and Social Justice: Rapid Research and Evidence Review. Final Report*, Defra).

⁹ Convention on Biological Diversity, COP 12 Decision XII/5 (2014), annex, para. 1.

¹⁰ Suich, H., Howe, C., and Mace, G. (2015) ‘Ecosystem services and poverty alleviation: A review of the empirical links’, in *Ecosystem Services*, Vol. 12, pp.137–147.

¹¹ ILO (2018) *World Employment and Social Outlook 2018: Greening with jobs*, p.7 [online] https://www.ilo.org/weso-greening/documents/WESO_Greening_EN_web2.pdf (accessed 28 May 2020).

¹² ILO (2017) *Indigenous Peoples and Climate Change: From Victims to Change Agents through Decent Work* [online] https://www.ilo.org/wcmsp5/groups/public/---dgreports/---gender/documents/publication/wcms_551189.pdf (accessed 13 June 2020).

¹³ Report of the Special Rapporteur on extreme poverty and human rights (2019) *Climate change and poverty*, Forty-first session 24 June–12 July, A/HRC/41/39.

¹⁴ This position is largely outdated especially given that green growth has been demonstrated by some to be illusory. See, e.g. Hickel, J., Kallis, G., (2020) ‘Is Green Growth Possible?’, in *New Political Economy*, Vol. 25, No 4, pp.469-486.

¹⁵ An initial assessment of 300 recovery plans presented in April 2020 found that only 4% of the policies adopted to rescue the economy were "green", with a potential to contribute to climate change mitigation,

whereas 4% were "brown", contributing to the increase of GHG emissions, and 92% maintained the status quo (Hepburn, C. et al. (2020) 'Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change?', in *Oxford Review of Economic Policy*, May). This is deeply concerning. If left unchecked, this approach shall lead to an important "rebound" of emissions after their drop in 2020 due to the pandemic and the ensuing slowdown of the economy.

¹⁶ Resolution General Assembly (2015) *Transforming our world: the 2030 Agenda for Sustainable Development*, 25 September, A/RES/70/1.

¹⁷ Report of the Conference of the Parties on its twenty-first session held in Paris from 30 November to 13 December 2015 (2016) FCCC/CP/2015/10/Add.1.

¹⁸ Magraw, D., Rosemberg, A., and Padmanabhan, D. (2016) 'Human Rights, Labour and the Paris Agreement on Climate Change', in *Environmental Law and Policy*, Vol. 46, No 5, pp.313-320 ; Morena, E., Krause, D. and Stevis, D. (2020) *Just Transitions: Social Justice in the Shift Towards a Low Carbon World*, Pluto Press, pp.46-54, London.

¹⁹ ILO (2017) *World Social Protection Report 2017-19: Universal Social Protection to Achieve the Sustainable Development Goals*, pp.188-189.

²⁰ See for example, in the European Union, the roles played by the Just Transition Mechanism and the Modernisation Fund: Communication from the European Commission (2020) A Strong Social Europe for Just Transitions, COM 14 final, 14 February.

²¹ ILO, supra note 11, p.43 ; Montt, G. et. al (2018) 'Does climate action destroy jobs? An assessment of the employment implications of the 2-degree goal', in *International Labour Review*, Vol. 157, No 4, p.531.

²² ILO and ILS (2012) *Working Towards Sustainable Development: Opportunities for Decent Work and Social Inclusion in a Green Economy* ; United Nations Framework Convention on Climate Change (2016) *Just Transition of the Workforce, and the Creation of Decent Work and Quality Jobs*, FCCC/TP/2016/7, p.13.

²³ United Nations Framework Convention on Climate Change, *ibid.*, p. 53; ILO (2019) *Skills for a Greener Future: A Global View based on 32 country studies*.

²⁴ International Trade Union Confederation (2019) *The Contribution of Social Dialogue to the 2030 Agenda Promoting a Just Transition towards sustainable economies and societies for all*, p.10.

²⁵ ILO (2015) *Guidelines for a just transition towards environmentally sustainable economies and societies for all*.

²⁶ UNFCCC, supra note 21.

²⁷ van der Ree, K. (2019) 'Promoting Green Jobs: Decent Work in the Transition to Low-Carbon, Green Economies', in *International Development Policy*, Vol. 11, p.258.

²⁸ ILO, supra note 22.

²⁹ ILO, supra note 11, p.132.

³⁰ International Trade Union Confederation (2017) 'Just Transition - Where are we now and what's next', *ITUC Climate Justice Frontline Brief*, p.13.

³¹ See the website of the project detailing the principles, the economic model and the history of this social initiative: <https://www.tzclld.fr/>.

³² Schwarzer, H. et al. (2016) *Protecting people and the environment: Lessons learnt from Brazil's Bolsa Verde, China, Costa Rica, Ecuador, Mexico, South Africa and 56 other experiences*, ILO, ESS – Working Paper No. 54.

³³ Lansing, D. (2017) 'Understanding Smallholder Participation in Payments for Ecosystem Services: the Case of Costa Rica', in *Human Ecology*, Vol. 45, pp.77-87.

³⁴ ILO, supra note 11, p. 117 ("While 19 per cent of the privately funded PES reviewed include a pro-poor focus, the figures are respectively 40 and 36 per cent for non-profit and publicly funded PES (...). 47 per cent of the large national programmes (often financed through public funds) include a pro-poor focus, compared with 27 per cent of local schemes (usually privately financed)").

³⁵ See Wood, R.G. (2011) 'Is there a role for cash transfers in climate change adaptation?', in *IDS Bulletin*, Vol. 42, No. 6, pp.79–85.

³⁶ Agence Française de Développement (2016) *Social protection and climate change: Greener economies and just societies - How has the removal of fuel subsidies in Egypt affected its people and the climate? Social Protection and Climate Change Country Briefs Series*.

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- ³⁸ ILO (2017) *Gender, labour and a just transition towards environmentally sustainable economies and societies for all*.
- ³⁹ ILO (2019) Policy brief, *Persons with disabilities in a just transition to a low-carbon economy*.
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- ⁴⁴ ILO, *supra* note 41, p.34.
- ⁴⁵ See European Agency for Safety and Health at Work (2013) *Green jobs and occupational safety and health: Foresight on new and emerging risks associated with*.
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- ⁵⁰ ILO, *ibid.*, p.35.
- ⁵¹ ILO, *ibid.*, p.36.
- ⁵² United Nations Environment Programme, *supra* note 45, p.62.
- ⁵³ International Energy Agency (2019) *World Energy Outlook 2019*.
- ⁵⁴ International Renewable Energy Agency (2019) *Global energy transformation: A roadmap to 2050*, p.10.
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- ⁵⁷ IEA, IRENA, UNSD, WB, WHO, *ibid.*, p.69.
- ⁵⁸ IEA, IRENA, UNSD, WB, WHO, *ibid.*, p.69.
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- ⁸⁰ The access rate in rural areas was 79% in 2017, much lower than the urban access rate of 97% (UN Department of Economic and Social Affairs (2019) *Accelerating SDG7 Achievement*, p.16).
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- ¹²⁰ Garnett, T. (2013) ‘Food sustainability: problems, perspectives and solutions’ in *Proceedings of the Nutrition Society*, Vol. 72, pp. 29–39.

¹²¹ Attempts are made to assess the "true costs" of food production, in projects such as TEEBAgriFood (housed at the United Nations Environmental Programme (UNEP) and led by the The Economics of the Ecosystems and Biodiversity (TEEB) Office).

¹²² See Food and Agricultural Organisation of the United Nations (FAO), International Fund for Agricultural Development (IFAD), United Nations Children Fund (Unicef), World Food Programme (WFP) and World Health Organisation (WHO) (2020), *The State of Food Security and Nutrition in the World*, p. 5 (noting that "Healthy diets are unaffordable to many people, especially the poor, in every region of the world. The most conservative estimate shows they are unaffordable for more than 3 billion people in the world. Healthy diets are estimated to be, on average, five times more expensive than diets that meet only dietary energy needs through a starchy staple ... The cost of a healthy diet exceeds the international poverty line (established at USD 1.90 purchasing power parity (PPP) per person per day), making it unaffordable for the poor. The cost also exceeds average food expenditures in most countries in the Global South: around 57 percent or more of the population cannot afford a healthy diet throughout sub-Saharan Africa and Southern Asia").

¹²³ Popkin, B. et al (2019), 'Dynamics of the double burden of malnutrition and the changing nutrition reality', in *The Lancet*, 15 Dec. [online] [https://doi.org/10.1016/S0140-6736\(19\)32497-3](https://doi.org/10.1016/S0140-6736(19)32497-3) (accessed 08 June 2020) ; Drewnowski, A 'The economics of food choice behavior: why poverty and obesity are linked', in A. Drewnowski and B. Rolls (eds.), *Obesity treatment and prevention: new directions* (2012), pp. 95–112, Basil: Nestec Ltd, Vevey/S Karger AG. By contrast, obesity increases are largest among wealthier households in countries in sub-Saharan Africa and south Asia which are still undergoing a nutrition transition. See also Swinburn B. et al., (2019), 'The Global Syndemic of Obesity, Undernutrition, and Climate Change: The Lancet Commission report', in *The Lancet*, 27 January, S0140-6736(18)32822-8, [online] <http://dx.doi.org/10.1016> (accessed 13 June 2020)

¹²⁴ Sassi, F. (2010) *L'obésité et l'économie de la prévention: objectif santé*, pp.83-84, Paris.

¹²⁵ Report submitted by the Special Rapporteur on the right to food Olivier De Schutter (2010) A/HRC/16/49. See also reports from Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES); Intergovernmental Panel of Experts on Climate Change (IPCC); Independent Group of Scientists appointed by the Secretary-General on the progress towards the SDGs; the Global Commission on Adaptation; the International Panel of Experts on Sustainable Food Systems (IPES-Food) and the Committee of World Food Security's High-Level Panel of Experts (HLPE).

¹²⁶ Douwe van der Ploeg, J. et al. (2019) 'The economic potential of agroecology: Empirical evidence from Europe', in *Journal of Rural Studies*, Vol. 71, p.13.

¹²⁷ Douwe van der Ploeg, J. et al., *ibid.*, p.13.

¹²⁸ IEA (2019) *CO₂ emissions by product and flow. CO₂ Emissions from Fuel Combustion Statistics*.

¹²⁹ UNECE (2012) *From Transition to Transformation. Sustainable and Inclusive Development in Europe and Central Asia*.

¹³⁰ UNECE, *ibid.*

¹³¹ Mitchell, G. and Dorling, D. (2003) 'An environmental justice analysis of British air quality', in *Environment and Planning A*, Vol. 35, No 5, pp.909-929.

¹³² OECD (2019) *ITF Transport Outlook 2019*.

¹³³ Enzler, H. (2017) 'Air travel for private purposes. An analysis of airport access, income and environmental concern in Switzerland', in *Journal of Transport Geography*, Vol. 61, pp.1-8.

¹³⁴ Titheridge, H. et al. (2014) *Transport and Poverty. A review of the evidence*, University College London.

¹³⁵ UK Government, Department for Business, Energy & Industrial Strategy (2019) *UK Government GHG Conversion Factors for Company Reporting*.

¹³⁶ Smith, N. et al. (2012) 'Accessibility and capability: the minimum transport needs and costs of rural households', in *Journal of Transport Geography*, Vol. 21, pp.93-101.

¹³⁷ OECD, *supra* note 137.

¹³⁸ Cresswell, T. et al. (2017) *Living in the Mobility Transition. Project report*.

¹³⁹ Nieuwenhuijsen, M. and Khreis, H. (2016) 'Car free cities: Pathway to healthy urban living', in *Environment International*, Vol. 94, pp.251-262.

¹⁴⁰ Liu, Q. et al. (2019) 'Egalitarianism and public perception of social inequities: A case study of Beijing congestion charge', in *Transport Policy*, Vol. 74, pp.47-62.

¹⁴¹ IEA (2019) *Global EV Outlook 2019*.

¹⁴² Vidhi, R. and Shrivastava, P. (2018) 'A Review of Electric Vehicle Lifecycle Emissions and Policy Recommendations to Increase EV Penetration in India', in *Energies*, Vol. 11, p. 483. The use of rechargeable lithium-ion batteries to power electric vehicles and energy storage units requires the mining of battery metals, which has led to the contamination of water bodies and other forms of pollution, dam disasters, the forced eviction of communities. This calls for a strict regulation of the mining industry to avoid such harms in the future.

¹⁴³ Henderson, J. (2020) 'EVs Are Not the Answer: A Mobility Justice Critique of Electric Vehicle Transitions', in *Annals of the American Association of Geographers*, [online] doi: [10.1080/24694452.2020.1744422](https://doi.org/10.1080/24694452.2020.1744422) (accessed 11 June 2020).

¹⁴⁴ ILO (2019) *Jobs in green and healthy transport. Making the green shift*, p.30.

¹⁴⁵ Id., p.27.

¹⁴⁶ European Environment Agency (EEA) (2019) *Sustainability transitions: policy and practice*, No. 09/2019, pp.25-26.

¹⁴⁷ Arthur, W.B. (1994) *Increasing returns and path dependence in the economy*, University of Michigan Press.

¹⁴⁸ Tversky, A. and Kahneman, R. (1991) 'Loss Aversion in Riskless Choice: A Reference-Dependent Model' in *Quarterly Journal of Economics*, Vol. 106, pp.1039-1061; Kahneman, D. (2011) *Thinking, Fast and Slow*, Farrar, Straus & Giroux, pp.289-299; Thaler, R. (2015) *Misbehaving. The Making of Behavioural Economics*, Penguin Books, pp. 12-19.

¹⁴⁹ Stiglitz, J. E. (2012). *The price of inequality: How today's divided society endangers our future*, WW Norton & Company.

¹⁵⁰ UNCTAD (United Nations Conference on Trade and Development) (2017) *Beyond austerity: Towards a global new deal*, Trade and Development Report, p.119.