UKaid
from the British people

WOW // Work and Opportunities for Women

Women and the Net Zero economy: A briefing on changes in garment, agriculture and energy supply chains

WOW Helpdesk Guidance Note No. 3

April 2021

Purpose of this document: To help the UK government ahead of COP26 in its thinking around how to better understand the differential effects of climate change and identify opportunities for the transition to a net-zero economy to deliver decent job opportunities for women.

This Briefing together with the complementary primer on **Women's Economic Empowerment and Climate Change,** make up the **WOW guidance note 3.**

Authors and institutional affiliations: Georgia Stevenson (PwC), with support from Samantha Harris (BSR), Cristina Bortes (PwC) and Emma Doherty (PwC).

The Work and Opportunities for Women (WOW) programme is a flagship programme funded by the UK's Foreign, Commonwealth and Development Office (FCDO). The objective of WOW is that women have access to improved economic opportunities through business interventions in global value chains and economic development programmes. The five-year programme aims to enhance the economic empowerment of 300,000 women working in global value chains by September 2022. It will achieve this goal by supporting businesses, organisations and programmes that are ready and willing to act on women's economic empowerment; enabling players across the value chain ecosystem to drive change; and influencing the UK and global agenda on women's economic empowerment.

WOW is delivered by a consortium of global experts at the cutting edge of women's economic empowerment research, programme design, and delivery – including PwC, BSR, CARE International, the University of Manchester, and Social Development Direct.

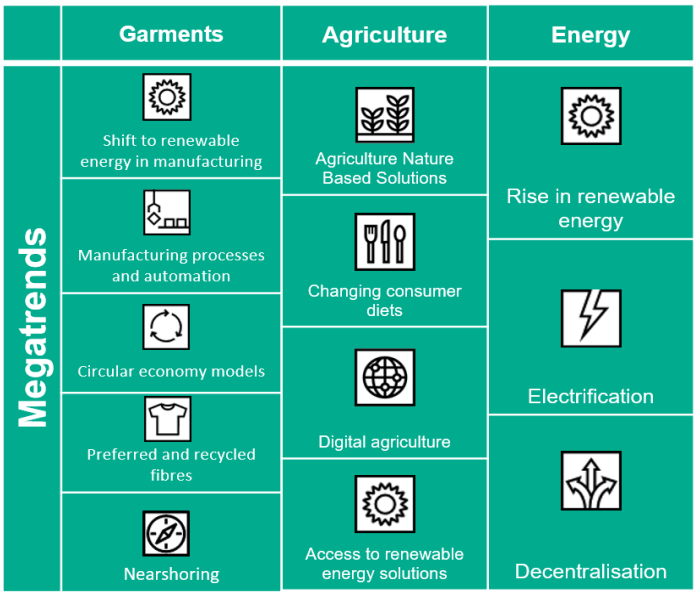
Executive Summary

Over the past 18 months there has been a surge of pledges to reach net zero greenhouse gas emissions from countries, companies, investors, universities, cities and regions which collectively represent 25% of global CO2 emissions and over 50% of GDP (UNFCCC,n.d.). It is expected that the transition to a net zero economy will increase the net number of jobs (ILO, 2018). However, there is likely to be delays and geographic disconnects between job losses and job creation, which means that unemployment may rise in some regions, sectors or roles, while it decreases in others.

The transition will occur in an already unequal workforce. In 2019, one in five of working people still lived in extreme or moderate poverty, while women's representation in the labour force was almost a third lower than men's (ILO, 2020a). **Change will not be gender neutral**. Stakeholders who are driving the transition, including governments and businesses, must consider how it will impact workers differently, including men and women, formal and informal workers, as well as seeking to overcome existing inequalities that are embedded in global value chains.

This paper considers the following megatrends that will shape the transition to net zero across three sectors. Drawing on primary research with companies and key informants to analyse the impact on the workforce and make recommendations to mitigate risks and increase opportunities for women.

Diagram I: Identifies the megatrends on the path to a zero-carbon economy across three sectors



For too long, climate change and social development communities have worked in silos, using different statistics, language and stories without looking at the interconnectivity of the two when setting targets and reporting impact. **This briefing calls for a gender just transition to net zero**, which harnesses women's skills and energy and incorporates an understanding of women's current position in the workforce and the barriers they face, to design an equitable transition that protects people's livelihoods and increases opportunities for work. The need to address underlying barriers to women's economic empowerment is not a new one but must be integrated into any workforce planning right from the start, as central to the transition.

Recommendations for Government

The UK's G7 Presidency and hosting of COP26 in 2021, are critical in setting a pathway for a successful and fair transition to a net zero economy, driven by public and private sector collaboration and partnership. The recommendations below identify specific opportunities for the UK Government to champion at COP26 and the G7 Summit and continue to deliver thereafter. They will need to be developed in partnership with others to ensure solutions are context specific.

Table 1. Recommendations for Government to ensure a Gender Just Transition to Net Zero

RECOMMENDATIONS FOR GOVERNMENT	
ADDRESS UNDERLYING BARRIERS TO WOMEN'S ECONOMIC EMPOWERMENT	• Understand the barriers faced by women through **improving data** collected on women in the workforce and **engaging women workers, representatives and communities**. • Increase women's **access to finance and technology** and financial and digital literacy. • Improve **access to education** and women's participation in STEM subjects to enable them to access new technologies and new jobs. • Strengthen women's **land rights.** • **Promote women's leadership** and engage and support women's organisations.
INFLUENCE AND SUPPORT BUSINESS	• **Promote a gender just transition** to net zero, which takes a people-centred approach by including social equity in mandatory climate disclosure, e.g. Taskforce on Climate related Financial Disclosures. • Develop **WEE metrics and frameworks** that align with business decision-making approaches and language. • Encourage businesses to adopt **gender sensitive working practices** to overcome barriers to women's participation, including flexible working, childcare support and travel provision. • Incentivise businesses to increase women's representation through **procurement guidelines** and **public policies** that mandate at least 30% female participation. • Partner with businesses to deliver **up-skilling programmes** for women workers, focusing on technical and managerial skills. • Facilitate **sectoral collaboration and learning** with businesses, workers and communities to identify and promote job substitution, transformation and creation. • Support initiatives that **measure and incentivise responsible business** practices including true cost accounting and socio-economic valuation and corporate benchmarking. • Use **industrial strategies** to provide **clear demand signals to businesses** for workforce needs. • **Legislate for decent work** and ensure companies pay decent wages, safeguard workers' freedom and protect them from harm.

PROVIDE EDUCATION AND SOCIAL PROTECTION	• **Engage in education** to support women's participation in STEM subjects. • Develop more **comprehensive social protection schemes** in countries where there is risk of job elimination. • Design policies that **protect informal workers**. Providing women greater agency over their working patterns and supporting higher participation in the labour market.

Recommendations for companies

Companies have an important role to play in closing the emissions gap and many companies have recently made net zero pledges. However, to meet these pledges, they will need to look at reducing scope 3 emissions which will change how the companies run their supply chains and interact with their suppliers as well as their workforce. We are presenting below our recommendations for companies operating in the three sectors mentioned above.

Diagram 2: Outlines key recommendations for companies across the three sectors

RECOMMENDATIONS FOR COMPANIES					
GARMENTS 	**Understand the profile of the existing and future workforce** Identify and engage the 'winners' and 'losers' of the transition to net zero through participatory mapping	**Incorporate gender analysis in emissions reduction approaches** Include the findings of the participatory mapping and gender analysis	**Ensure people and equity-centred decisions** Review anticipated emissions reduction and impact on jobs before deciding the strategy	**Engage in upskilling programmes** Consider barriers to women's participation during the design to ensure that women can successfully participate	**Ensure changes through procurement** Consider procurement policies that mandate a proportion of female representation in job creation.
AGRICULTURE 	**Understand the context** Consider how women's access to land rights, mobile technology and finance impact their ability to participate and benefit	**Ensure changes through procurement** Share sustainable dividends with the value chain, including increasing the price paid to smallholders if required		**Invest in climate smart agriculture research and gender analysis** Design and implement new, sustainable approaches in collaboration with women farmers and gender experts to ensure solutions are appropriate at the local level and are used by women farmers.	
ENERGY 	**Tailor training design** Training should support both workers transitioning from traditional energy jobs and those who are not currently working in the energy sector	**Develop gender sensitive working practices and social norms** Tailor job roles and ways of working to address social norms and overcome some of the current barriers to women's participation, including provision of childcare support or travel requirements		**Set quotas for female recruitment** Consider setting targets for women's representation and work in collaboration with local communities to recruit and train women	

Table of contents

Acronyms

Ag-Nbs	Agriculture practices or nature-based solutions
CO2-eq	Carbon dioxide equivalent
COP / COP26	Climate Change Conference of Parties. COP26 is taking place in 2021.
CSA	Climate Smart Agriculture
DRE	Decentralised renewable energy
EU	European Union
FCDO	Foreign, Commonwealth & Development Office
GHG	Greenhouse gas
GDP	Gross domestic product
GVC	Global value chain
IPCC	Intergovernmental Panel on Climate Change
IFC	International Finance Corporation
KIIs	Key informant interviews
LSC	Levi Strauss & Co
STEM	Science, technology, engineering, and mathematics
SBTi	The Science-Based Targets Initiative
TCFD	Taskforce for Climate-related Financial Disclosure
UN	United Nations
WEE	Women's Economic Empowerment

1. Introduction

The UN has called for a decade of action during the 2020s to accelerate sustainable solutions to the world's biggest challenges, including climate change and inequality (including gender). The COVID-19 pandemic has highlighted the impact of inequality on individuals' vulnerability and resilience and the disruption that external factors can wreak on businesses. While the global response to the pandemic has brought an abrupt decrease in global emissions in 2020, the data is showing a fast rebound in emissions as economies and societies reopen, with December 2020 global emissions 2% higher than the previous December (IEA, 2021). The pandemic has also seen the biggest setback to achieving gender equality in a decade due to a dramatic increase in burden of unpaid care work and the disproportionate representation of women in low paid, informal work, many of whom have lost employment with little or no social protection (Sprechmann, 2020).

Recovery has led to calls for governments and companies to build back better (Vivid Economics, 2021) and ensure inclusive recovery leads to the creation of decent zero-carbon jobs, drives innovation and growth, and strengthens resilience to systemic shocks.

DEFINITIONS

Women's Economic Empowerment: Women having the ability to succeed and advance economically, and the power to make and act on economic decisions to enhance their well-being and position in society. (Calder et al., 2020).

Net Zero: According to the Intergovernmental Panel on Climate Change net zero emissions are reached when human-caused emissions of greenhouse gases (GHG) to the atmosphere are balanced by removals over a specific period. For nations and companies, this means taking concerted action to reduce existing emissions as far as possible and then removing the remaining emissions, predominantly through natural carbon sinks such as oceans and forests.

Emissions "Scopes": To categorise emissions for GHG accounting and reporting purposes the following three "scopes" are used:

- **Scope 1:** Direct GHG emissions that occur from sources that are owed or controlled by the company, such as vehicles, buildings, boilers etc.
- **Scope 2:** GHG emissions from the generation of electricity consumed by the company.
- **Scope 3:** Covers all other indirect emissions that occur as a result of the company's activities but not from sources that are owned and controlled by the company.

As outlined in the Women's Economic Empowerment and Climate Change Primer, addressing climate change can create rapid improvements in gender inequality and improving women's economic empowerment can support environmental and climate outcomes. The transition to the net zero economy is not gender neutral and consideration must be given to the impact of the transition on workers, male and female, formal and informal and existing inequalities in global value chains. Women make up half the global population, ensuring their ability to access full and productive employment is the right thing to do to create a more equitable, sustainable society for the future.

This document outlines the key megatrends that will drive this transition in three high-emitting sectors, before examining how it will impact the workforce in low- and middle-income countries and the knock-on effect on women's economic empowerment.

2. Transforming supply chains to reach Net Zero

Progress to date

Over the past 18 months there has been a surge of pledges to reach net zero carbon emissions from countries, companies, investors, universities, cities and regions which collectively represent 25% of global CO2 emissions and over 50% of GDP (UNFCCC,n.d.). As ambition grows there is an urgent need to define how the pledges will be met. Of the 121 countries with net zero goals, only seven[1] have created intermediate sector level targets and roadmaps (WEF, 2020).

Companies[2] have a pivotal role to play in reducing emissions[3]; their actions, resources, ability to innovate, and wide reach are critical to transitioning industries, value chains and infrastructure. For many companies, **upstream emissions from products, services and investments (referred to as Scope 3 emissions) represent the most significant proportion of overall emissions[4] and are often the greatest challenge to reduce**. Reducing Scope 3 emissions will be fundamental for companies to realise credible change but decarbonizing value chains is hard, even leading companies struggle to get the data they need and set clear targets and standards to which their suppliers must and can adhere. Engaging an often-fragmented, diverse and changing supplier landscape is challenging – especially when emissions are "buried" deep in the supply chain, or when addressing them might require collective action at the industry or multi-stakeholder level.

Impact on jobs

Changes to value chains and business operating models will have implications for the structure and profile of the workforce. The transition to net zero will lead to changes, positive and negative, for workforces around the world. In the UK alone, over 2.2 million people may be negatively affected, needing retraining and/or reskilling to meet the net zero economy (Keating, 2020).

[1] Including Denmark, Norway, Sweden and The Netherlands.
[2] While this briefing focuses on companies, capital markets will play an important role in recognising and valuing the impact that companies have and incentivising GHG emission reductions.
[3] The Science-Based Targets Initiative (SBTi) provides clearly defined pathways for companies, including selected sectoral guidance, to reduce GHG emissions (without the use of offsets), helping to prevent the worst impacts of climate change and future-proof business growth. According to the SBTi, targets must cover 95% of scope 1 and 2 GHG emissions and should cover Scope 3 where they represent over 40% of emissions (BCG, 2021).
[4] For companies in most customer-facing sectors for example, end to-end emissions are much higher than the direct emissions in their own operations (so-called Scope 1 and 2 emissions). Eight supply chains (two of them being food and fashion) account for more than 50% of global emissions.

The impact on jobs can be broadly categorised into four areas:

- **JOB ELIMINATION:** In some areas, there will be no direct replacement for certain types of employment. Job losses may be in male-dominated sectors such as the extractive industry but an increase in automation may also displace jobs that are currently held by women. Job elimination impacts individuals, households and communities and social protection schemes are critical to prevent an increase in income inequality. In South Africa, as many as 120,000 jobs may be eliminated in the coal industry, threatening economic activities across four coal-focused municipalities and more than 2.3 million people (Gatticchi, 2020).
- **JOB SUBSTITUTION:** As certain jobs are lost companies and sectors they may be replaced by new, low-carbon alternatives. To take advantage of this substitution, workers will require upskilling or reskilling to prevent unemployment.
- **JOB TRANSFORMATION:** The transition to net zero may lead to transformation or redefinition of existing jobs. For example, engineers who previously serviced gas boilers may transition to servicing low-carbon heat pumps. Training will be required to ensure that workers are able to transition, including soft and technical skills.
- **JOB CREATION:** As the net zero economy develops, new job opportunities will be created. For example, decentralised renewable energy products (DRE) offer a range of new jobs including sales, installation, servicing and maintenance to communities not currently part of the electricity grid. This is an opportunity to bring excluded populations, like women, into the job market. Employment opportunities should be used to create decent work that is productive and offers a fair income, ensures security in the workplace and social protection for households, prospects for social integration and personal development, and equal treatment and opportunity.

Evidence suggests that action to transition to a net zero economy will increase the number of jobs overall on a global scale. Measures to change the production and use of energy alone will lead to the creation of 24 million jobs, although 6 million will also be lost (ILO, 2018). Despite a net positive gain of 18 million jobs, there are likely to be delays and geographic disconnects between job losses and creation which means that unemployment may rise in some regions while it decreases in others.

Just transition and the labour market

The 2015 Paris Climate Agreement recognises the necessity of prioritising decent work and income opportunities as part of the decarbonisation process. **A 'just transition' is an economy-wide, participatory process involving companies, communities, unions and governments to design an economy where GHG emissions are net zero, people have decent jobs and poverty is eradicated and communities thrive** (The B Team, 2018). Central to the approach is social dialogue, to understand the impact of emission reduction efforts on workers and communities and co-create solutions that increase opportunities and mitigate risks.

This social dialogue will need to take place on a global level to ensure that the burden of transitioning to net zero does not disproportionately fall on low- and middle-income countries. It is the responsibility of countries with higher historic emissions to decarbonise faster, whilst working with emerging economies to help them reduce emissions as quickly as is economically and technologically possible.

A just transition requires a context-specific understanding of the challenges and opportunities for workers and the state capacity and fiscal space to design a coherent approach. Net zero approaches need to balance emissions reduction strategies with human development needs and other contextual factors (see Table 1 for some indicative contextual factors). As well as supporting workers who risk job losses through the transition, there is an urgent need to improve the job prospects for people who are currently unemployed or working in insecure and unsafe work, as well as the millions of young people joining the job market every year. In 2019, more than 630 million workers (1 in 5 of all those employed) still live in extreme or moderate poverty (ILO, 2020a). Women remain underrepresented in the workforce, with participation rates of 47%, almost a third below male participation (74%), but overrepresented in the informal sector where they lack social protection, workers' rights and collective representation.

Table 1. Indicative comparison of a just transition in high, middle- and low-income countries[5].

	HIGH INCOME / DEVELOPED ECONOMIES	MIDDLE INCOME / EMERGING ECONOMIES	LOW INCOME / DEVELOPING ECONOMIES
POLITICAL ECONOMY CONTEXT	Higher state capacity and fiscal space. Advanced technology adoption and well-established intellectual property market. Political intent to increase trade autonomy through shortened GVCs.	Lower state capacity and fiscal space. Uneven access to advanced technology.	Lower state capacity and fiscal space. Low technology adoption. Primarily involved in upstream GVCs providing intermediate products and services (Keane *et al.*, 2021*)*. High reliance on imports for access to essential products.
JOB MARKET CHARACTERISTICS	Stronger union presence to advocate for workforce. High level of education amongst the population.	Lower union presence. Varying levels of human capital between lower-middle and upper-middle countries as well as intra-country (Lazo and Fernandez-Mendoza, 2018). Some manufacturing jobs at risk from automation. Women are predominantly represented in the informal sector.	Lower union presence. Most workers remain in low-productivity employment, often in the informal sector. Lower human capital overall as well as more pronounced gender gaps in human capital[6].
ENERGY MIX	Energy provision is typically on-grid. Shift from fossil fuel to renewable energy will lead to reduction of jobs in extraction. Job creation through renewable	Energy provision is typically on-grid in urban and developed areas (Palma, 2018). High reliance on coal-power for industrial policy in some countries e.g. South Africa, Indonesia. Some rural areas still rely on off-grid or decentralised	Higher proportion of decentralised renewable energy (Power for All, 2019). In some countries (e.g. Uganda) renewable energy is already most of the energy supply but in

[5] This table outlines indicative characteristics of high, middle- and low-income countries and how this may affect the transition. The characteristics are not exhaustive and there is likely to be significant variation within income groups - for example, energy mix varies significantly depending on whether a country is a significant producer of fossil fuels. The information contained in this table is drawn from the literature and interviews.

[6] The World Bank's Human Capital Index is a forward-looking measure of how current health and education outcomes will shape productivity for the next generation of workers (World Bank, 2019).

	energy although employment multipliers may be lower.	energy solutions.	others (e.g. Gabon, Chad) dependence on oil extraction remains significant.
IMPACT OF NET ZERO TRANSITION	Job elimination and creation are primarily direct and formal.	Job loss and creation is mixed between informal and informal work.	Job loss and creation is primarily in informal work.

This research draws on primary research with companies and key informants across the three selected sectors to explore how changes to labour markets, driven by net zero commitments, will impact on women.

3. What does Net Zero mean for women in supply chains - a sector perspective

This section explores three sectors, in order to understand the megatrends that will shape the transition to net zero in low- and middle-income countries; provide an analysis of the subsequent impact on the workforce and propose recommendations to advance women's economic empowerment in the net zero economy.

Garments

The fashion industry is responsible for 10% of annual global carbon emissions, more than all international flights and maritime shipping combined. To limit global warming to 1.5C, the industry needs to cut GHG emissions to 1.1 billion metric tons of CO2-eq but instead, driven by fast fashion and growing consumption in middle income countries, its climate impact is predicted to overshoot this target by almost 50% from 2018 – 2030 without additional abatement measures (McKinsey, 2020; World Bank, 2019; Quantis, 2018). Companies at the forefront of climate leadership are considering adapting existing business models, by increasing the use of renewable energy and materials with lower environmental impact, and in some instances, transitioning to new, more circular business models that will reduce global production of garments. The complexity of supply chains and the significance of Scope 3 emissions mean that the transition to net zero emissions will require further innovation and collaboration to meet the challenge. Nike's value chain alone produces more than 1 billion units per year and uses approximately 16,000 unique materials in products. As part of their Move to Net Zero initiative their product creation teams now compare 57,000 materials from over 700 vendors against sustainability criteria to inform their material selection.

The transition to net zero will have a significant impact on the workforce, given the garment industry's role in the global economy, employing more than 60 million people, and driving economic activity in a number of developing countries, including 80% of export earnings and 20% of GDP in Bangladesh (Sadowski *et al.*, 2019). Women represent much of the workforce in manufacturing, ranging between 50 - 80% of national workforces, so will be particularly hard-hit (Barrientos *et al.,* 2018).

Below, we set out five megatrends that will shape how the sector transforms as it moves towards net zero and examine the impact on the workforce, and women in particular. These megatrends do not occur in isolation and may reinforce each other, for example circular economy models tend to rely on a higher skilled workforce which may also increase nearshoring.

Megatrend	Transition to Net Zero	Impact on workforce
 **Shift to renewable energy**	Switching energy provision for production from traditional sources to renewable energy could reduce emissions by up to 45% within textiles and garments. Factories are currently mostly powered by fossil fuels. Companies can work with direct operations and suppliers to shift to renewable energy. Companies with shared suppliers can use collective action to move renewable energy sources to where factories are located. **Example:** *Levi Strauss & Co (LSC) has co-developed a programme with the International Finance Corporation (IFC) to provide suppliers with low-interest trade financing with interest rates based on performance against energy efficiency and energy source. The IFC will provide access to loans for energy-related investments, key to achieving the target of a 40% reduction in Scope 3 emissions (Sadowski et al., 2019).*	Changing demand for energy production could play a role in national or regional shifts in employment with a reduction in jobs in fossil fuel extraction and processing and an increase in jobs in renewable energy. Jobs in oil, coal and gas have been traditionally held by men. The shift to renewable energy is an opportunity to increase women's access to employment and the number of women working in the energy sector. However, green jobs are not inherently decent jobs[8]. Manufacturing of renewable energy products also presents emerging risks around the chemicals involved and the use of forced labour. The impact of this megatrend will be explored further in the Energy sector section.
 **Manufacturing processes and automation**	Companies will make operational changes to decrease the amount of energy required. Including process efficiencies across suppliers and factories, such as increased automation and upgrades to less energy intensive machinery. **Example:** *New Balance offers third party energy audits to suppliers through IFC's Vietnam programme. These audits uncovered an average of 15 energy saving opportunities per site, representing 14 - 31% of annual energy consumption.*	Automation may lead to job losses. Job losses may disproportionately affect the most vulnerable workers and those working informally who are not able to adapt to new operational processes. In Tunisia, some small, rural factories are subcontracted by larger factories in urban areas to carry out discrete tasks such as stitching pockets. These cottage industries lack the capital to improve efficiency of water and energy use and could lead to job losses in low-income communities which may not be easily replaced. Where manufacturers can invest in new processes and machinery, jobs may require different skills, e.g. IT, and lower skilled workers with less access to training will struggle to adapt. These changes are likely to disproportionately affecting women who are concentrated in labour intensive work that is vulnerable to replacement by machinery. For example, in Bangladesh women constitute 55% of production workers but only 20% of supervisors and 1% of senior management (Sadowski *et al.,* 2019).
 **Circular economy models**	Estimates suggest that more than half of 'fast fashion' products are disposed of within a year but by shifting consumer behaviour and values associated with consumption, the sector could reduce emissions by 347 million metric tons by 2030 (Ellen MacArthur Foundation, 2017). Alternative business models include garment rental, resale and repair, as well as changes to how consumers treat clothes such as reduced washing and drying. Research shows that increasing the lifespan of a pair of jeans by 30% would reduce the environmental impact by 23% (PwC, 2020b). While companies can introduce more durable design and decrease the frequency of new collections, without a corresponding decrease in demand for new products, circular business models alone will not achieve significant GHG reductions. **Example:** *H&M 'Looop' is being piloted in Sweden where customers pay a fee to transform an old*	Declining garment orders could result in factory closures and job losses, particularly in low- and middle-income countries where garment production is a major source of income. The COVID-19 pandemic demonstrated the vulnerability of economies dependent on the garment sector. Job losses from the circular economy will further compound this impact. During 2020 an estimated USD 3 billion garment orders were cancelled or postponed in Bangladesh, leading to 90% of factories closing and a loss of employment for 1 million out of 4 million employed in the industry (BSR, 2020). The impact will vary depending on location and may be particularly stark in North Africa and Asia (Schroder, 2020). While jobs may also be created by new circular economy models, though they may be concentrated in consumer markets and favour roles traditionally held by men such as logistics, IT and distribution. These changes have a disproportionate negative impact on women. However, opportunities exist to improve women's

[8] For more information on decent work, please see the ILO's Decent Work Agenda.

	garment into a new item using cutting edge technology (H&M, 2020).	access to better jobs[9]. A business model which values durability and quality over quantity could increase the supply of decent jobs, albeit in a context of a wider reduction in employment opportunities.
 **Preferred and recycled fibres**	Raw material extraction and processing of fibres accounts for 15% of the sector's GHG s emissions. Only a small proportion are currently produced using preferred methods and materials (Quantis, 2018). In 2019, polyester represented over half of global fibre production but less than a fifth is made from recycled polyester and less than 1% is bio-based (Textile Exchange, 2020). Selecting fibres that require lower environmental inputs, such as organic cotton, and increasing recycled fibres, can reduce emissions and environmental harm. **Example:** *Levi Strauss & Co has developed a blended fibre of cottonised hemp that does not use pesticides and requires approximately 70% less water.*	Increasing use of preferred fibres may lead to job creation or substitution, however, these may not be decent jobs. Waste collection is an area of significant concern with an estimated 80% of workers in waste management and recycling working informally, many experience hazardous working conditions and lack access to social benefits, as well as facing social stigma (BSR, 2020). At the processing level, some recycling processes incorporate significant use of chemical processes which can be harmful for workers.
 **Nearshoring**	Covid-19 exposed the vulnerability of global value chains. Political protectionism and emissions reductions, may lead to the shortening of value chains or 'nearshoring' where companies shift manufacturing clusters closer to consumer markets, for example in Eastern Europe or Central America (McKinsey, 2018a). The EU has signalled it will pursue strategic autonomy as a trade policy and will take measures to increase domestic production (Keane *et al.*, 2021) **Example:** *Nike has been making plans to nearshore production to the U.S. This would lead to a significant reduction in emissions as well as reduce lead times from 60 days to 10. However, this will be delivered by 1,200 automated machines which may cut up to 50% of employees in one supply chain. Estimates suggest 500,000 job losses, mostly from factories in Asia (Wilding, 2020).*	The relocation of manufacturing clusters could lead to dramatic impacts on the workforce. Without transitional policies, this impact is likely to be negative for countries of departure, with widespread job elimination and positive for countries of arrival.[10] In countries with a high dependence on garment jobs and where the majority of garment workers are female, this will significantly impact the working opportunities available to women.

[9] Existing jobs in the garment sector are not guaranteed to offer decent work with well-documented social issues in certain factories around low wages, long working hours, unsafe working conditions and exposure to violence and harassment.
[10] This assumes that the new factories operate with the same labour intensity as before. However, we can see from the example that nearshoring can be combined with automation approaches which reduces the number of workers required. This means that the negative impact on the country of departure significantly outweighs the positives for the country of arrival in terms of net jobs.

Recommendations

Based on these megatrends, the following recommendations outline actions for key stakeholders to ensure a just transition.

Companies should:

- **Understand the profile of the existing and future workforce:** Identify and engage 'winners' and 'losers' of the transition to net zero through participatory mapping. Engage the workforce, their representatives and the broader community to understand the impact beyond the formal workforce and core employees. While there are existing toolkits[11] for businesses to the Just Transition, applying a gender lens is new. Companies or sector bodies could partner with gender and climate experts to design a toolkit for the sector.
- **Incorporate gender analysis in emissions reduction approaches:** Incorporate the findings of participatory mapping and gender analysis into the design of restructuring approaches to ensure that job elimination does not disproportionately affect women. There is a business case for gender analysis, including mitigating reputational, legal and human rights risks as well as improving labour issues in value chains. The UK Government should continue to advocate for the importance of understanding gender risks and opportunities, and the importance of the regulatory environment to incentivise businesses to act (see recommendations for UK Government below).
- **Ensure people and equity-centred decisions:** review anticipated emissions reduction and impact on jobs together before deciding the strategy. This should be considered holistically to determine where emissions abatement strategies are and are not appropriate. Consider how approaches can be adapted to support decent work, for example avoiding hazardous chemicals in recycling from the outset.
- **Engage in upskilling programmes:** ensure women are given the space to successfully participate and profit from training. This should be further embedded through quotas for women's participation. Training should target workers whose jobs will be transformed (e.g. women to take on managerial roles or installing, operating or servicing new machinery); workers whose jobs will be lost and new entrants to the job market.

  Example: *Gap Inc. runs an education and life-skills training programme, P.A.C.E (Personal Advancement and Career Enhancement) for women and girls across 17 countries. The programme launched in 2007 in over 300 factory locations in collaboration with suppliers. Over the past decade, the training has expanded to reach more women in rural community settings supported through public, private and third sector partnerships (Gap Inc., 2020).*
- **Ensure change through procurement:** consider procurement policies that mandate a proportion of female representation in job creation, for example a proportion of women employed as a result of renewable power purchasing agreements. To support quotas, companies should model cultural expectations of gender equality amongst suppliers, such as giving visibility to women in leadership from the buying company and asking about gender representation during supplier site visits and participatory mapping exercises.

[11] Including The B Team's Business Guide.

Governments should:

- **Incentivise businesses to incorporate gender analysis:** as Taskforce on Climate related Financial Disclosures (TCFD)-aligned disclosures become mandatory from 2022, the UK Government should push for social equity as part of future recommendations. Social equity is not sufficiently considered as a climate transition risk and regulation would force the issue up the business agenda.
- **Partner for social protection:** in places at risk of significant job elimination, develop partnerships with government and civil society to implement social protection measures. In the short-term this could include cash-transfers like those delivered during the COVID-19 pandemic. In Myanmar, where 70% of garments are exported to the EU, the bloc made direct payments of between US$26 - $92 to furloughed or fired garment workers between April and December 2020 (ILOb, 2020).
- **Put in place industrial strategy and upskilling:** where there is a risk of widespread job elimination and the decline of a sector, governments should identify high-potential alternatives for labour-intensive economic growth. For example, during the Covid-19 pandemic, factories pivoted production away from garments into personal protective equipment. Upskilling and recruitment programmes will be required to support industrial strategy, and tailored approaches should ensure that women have equal access to new opportunities.
- **Legislate for decent work:** Labour laws are required to ensure that companies pay decent wages, ensure workers' freedom and protection from harm. Governments should also consider public policies that mandate at least 30% female representation in employment and make efforts to ratify relevant ILO Conventions. Government's own procurement policies and purchasing power provide opportunities to increase women's employment.

Agriculture

Globally, an estimated 21–37% of total GHG emissions are attributable to the agriculture sector (IPCC, 2019). Under business as usual these associated emissions are predicted to increase over the next 30 years, by 15-20% by 2050 (IPCC, 2019). Companies are committing to reducing emissions and improving biodiversity through nature-based approaches to agriculture and technology solutions. Unilever has committed to a deforestation-free supply chain by 2023 and zero emission by 2039 through regenerative agriculture and biodegradable ingredients (Unilever, 2020). Other companies may also reduce emissions-intensive products, including beef and dairy. These changes pose significant challenges to the livelihoods of more than two billion people employed in agriculture worldwide (McKinsey, 2020).

Women comprise over 37% of the world's rural agricultural workforce, rising to 48% in low-income countries (ILOb, 2020), yet less than 15% of landholders are women (FAO, 2020). Women are mainly involved in subsistence farming and typically responsible for supplying the household's daily requirements (Ceres, 2020). At the community level, women are more likely to manage natural resources than men, including soil and water management, afforestation and crop domestication. Women are also less likely than men to be employed in cash and high value crops and more likely to be temporary or informal workers when they are employed. In the Senegalese tomato sector, only 2% of female workers have permanent contracts, compared to 28% of male workers (FAO, 2010).

Women have a lower on average productivity compared to male counterparts, both in terms of yields and earnings (Ceres, 2020). In the Asia and Pacific region, women produce 20 - 30% less than men, despite working 12 - 13 hours more per week (FAO, 2011). The productivity gap is driven by socio-cultural factors, such as greater responsibility for unpaid care, and legal barriers, including ability to access finance and establish land titles. Women are less able to access productivity-enhancing inputs such as fertiliser, technology and farm equipment, high-yield seeds, hired labour and credit, and may be forced to use more marginal land while the best land is kept for male farmers and cash crops.

There is a risk that new agricultural techniques and technologies to reduce emissions in agricultural production mirror existing inequalities, thus further exacerbating the productivity gap, reducing women's resilience to climate shocks and damaging women's prospects for economic empowerment.

Below, we identify four megatrends that will influence agricultural production in low- and middle-income countries and the potential impact on the workforce.

Megatrend	Transition to net-zero	Impact on Workforce
 **Transition to climate smart agriculture (CSA)**	Over half of global agricultural lands are moderately to severely degraded and loss of productive land, along with increased food demand, pushes agriculture to be the primary driver in habitat loss. Deforestation accounts for 20% of emissions in the food value chain and should be addressed by transitioning to climate smart agriculture practices (CSA) and nature-based solutions (Ag-NbS) (Barrientos *et al*., 2018). These are cost-effective interventions that can enhance resilience in agriculture and food production, whilst mitigating climate impacts and increasing resilience through nature restoration. CSA is a broad term that encompasses a range of approaches to production, including organic agriculture, which relies on ecological processes, biodiversity and cycles, or conservation agriculture that includes a range of practices such as cultivation of cover crops or reducing tillage.	The impact on the workforce is dependent on the package of methods implemented at farm level as well as the type of labour. Approaches that require lower labour inputs can lead to negative impacts for those in wage employment (often men in agriculture) whereas unpaid labourers on family farms (often women) may benefit from a reduced burden in farm work which enables them to diversify their income (ILO, 2018). In sub-Saharan Africa, more labour-intensive approaches are usually met by unpaid, household labour rather than paid work and disproportionately affects women (Montt and Luu, 2019). Different approaches may also change the timing and balance of tasks, for example a reduction in tillage (predominantly carried out by men) but an increase in weeding (predominantly carried out by women). The transition to CSA approaches requires technical knowledge and an ability to pay for upfront costs. With lower access to capital and technical knowledge, women farmers are often less able to take the risk to transition to CSA (PARM, 2019).
 **Changing consumer diets**	Livestock accounts for 14.5% of global GHG emissions (FAO, 2013) and the Intergovernmental Panel on Climate Change (IPCC) recommends a reduction in meat consumption in order to reach net zero targets (IPCC, 2019). Companies may encourage more sustainable practices for meat and dairy production as well as encouraging a reduction in food waste and buying local as part of the pathway to net zero. Over time we expect consumer demand in high income countries to decrease for meat and dairy products while increasing for plant-based alternatives. Cargill noted that between 2006 and 2016 global dairy sales decreased 22% while plant-based milk sales tripled (Cargill, 2018). While some countries are starting to see shifts in consumer preferences and an increased demand for plant-based protein, global demand for animal protein is forecast to increase between 1 - 1.5% annually focused in geographic pockets of demand (McKinsey, 2018b). Demand will be driven by economic development, cultural preferences and demographic changes[12]. China is expected to contribute than 20% of increased demand for poultry and beef, and nearly 50% for pork and mutton but most countries in Asia Pacific, much of the Middle East, and Latin America (except Argentina and Brazil) show a low demand for meat with higher demand for legumes and vegetable as protein sources.	The impact on developing country workforces will depend on the extent to which a drop in demand for meat and dairy products in high income countries is offset by increasing demand elsewhere. Countries and regions that are reliant on exports to North America and Europe may see job elimination. In Latin America, it is estimated that there will be 4.3m fewer jobs in livestock herding, poultry, dairy and fishing (ILOa, 2020). Scaling up plant-based alternatives provides an opportunity for job creation and innovation[13], although the meat substitute market is expected to grow predominantly in European and North American markets. In Asia, meat alternatives are widespread (e.g. tempeh in Indonesia or soy milk in Japan) based on religious dietary restrictions and poverty. It is not clear that meat and dairy alternatives will lead to significant job creation or displacement in Asia and Africa, although further research in this area is required. While women account for an estimated two-thirds of poor livestock keepers, restrictions to land and credit mean they tend to be responsible for small scale poultry and are less likely to produce meat and dairy for export[14] (FAO, 2011). Based on the information available, this might imply that women are unlikely to be directly and/or significantly impacted by shifting consumer demand at a global level.

[12] Global demand will be increasingly influenced by the eating patterns of countries or regions with growing populations. While China accounts for significant meat demand, the plant-based meat substitute market is projected to grow 20 - 25% annually which could significantly drive the global market both in terms of innovation and demand.

[13]Plant-based alternatives is a high growth area, it is estimated that the market will exceed $480 billion by 2024.

[14] Livestock can play an important role in WEE, particularly where land rights are restricted, as they can serve as collateral and increase women's access to finance

 **Digital agriculture**	Technological advances offer significant opportunities to increase efficiency of food production through targeted, crop-specific advice to farmers. Advanced technology, such as agricultural artificial intelligence applications can help reduce emissions by up to 160Mt CO2-eq in 2030, increasing productivity whilst using fewer resources (PWC, 2020). According to the GSMA 2020 Digital Agriculture Maps, there are 437 information and communications technology and digital solutions actively operating in the African agriculture space. Farmers who received digitally delivered recommendations were 22% more likely to adopt the recommended inputs, yielding $10 in benefits for every $1 spent. (Fabregas *et al*, 2019). Digital advisory services bundled together with financial and other services have the potential to increase smallholders' incomes by 57% and productivity by 168% (WBCSD, 2021). Digital solutions can also improve value chain transparency which enables businesses to gather data and introduce services to tackle issues as they arise. **Example:** *AB InBev sources local crops like cassava and sorghum in Uganda from local farmers but realised that although it set a price for aggregators, farmers were often not getting the full price. Ab InBev has partnered with a blockchain enabled platform, Banqu, to use SMS technology to create a digital paper trail for every transaction - confirming the price, weight and payment with the farmer and AB InBev (Slavin, 2019).*	While technology can bring great net zero efficiencies, access is often unequal, with the economic benefits (in excess of USD$1 trillion gains in GDP) of precision agriculture likely to be focused in high-income countries in Europe, East Asia and North America (PwC, 2020). Digital solutions in agriculture are currently outpacing readiness to adopt and are not yet reaching poor, rural and small-scale farmers, especially women who are most disadvantaged. The requirements for farmer registries, digital agronomy data, soil mapping, pest and disease surveillance, weather data, market data, technical support and advisory services, as well as a lack of enabling infrastructure currently makes it difficult for digital solutions to be scaled at an affordable cost. Farmers in low- and middle-income countries have unequal access to digital technologies and knowledge, with women 8% less likely than men to own a mobile phone and 20% less likely to use mobile internet (GSMA, 2020). Women farmers grow about 70% of Africa's food but smallholder women farmers face barriers, of which access to information and digital tools have been identified as some of the biggest. Without targeted investment in digital upskilling and infrastructure, women farmers are less able to take advantage of innovation and technology which further exacerbates inequalities.
 **Access to renewable energy solutions**	Innovation in renewable energy products offers solutions to increase agricultural yields, such as solar water pumps for irrigation and biogas technologies. The Mexico Sustainable Rural Development project resulted in 1,842 agribusinesses adopting 2,286 environmentally sustainable technologies including renewable energy initiatives such as solar panels, contributing to an overall reduction of GHG emissions by 6.02 million tons (World Bank, 2019a). **Examples:** *Starbucks has committed to introduce climate justice criteria for their renewable energy procurement, which is already powering over 72% of the company's global operations (Starbucks, 2020).*	Similarly to digital solutions, the ability to increase yields under climate change conditions using renewable energy solutions relies on access to inputs and knowledge which can mirror existing inequalities. Women in rural areas face obstacles in accessing renewable energy technologies due to higher poverty levels and lower access to credit, literacy rates and access to information (EUEI, 2013).

Recommendations

Based on these megatrends, the following recommendations outline actions for key stakeholders to ensure a just transition to net zero.

Companies should:

- **Understand the context:** consider how women and men's access to land rights, mobile technology, and finance impacts their ability to participate in training, benefit from new technologies or access agricultural inputs and markets[15]. Companies should collect gender disaggregated data and engage with communities to understand women's access to training and inputs/finance in order to tailor approaches.

  Example: *Mars Wrigley is engaging women in cocoa-growing communities in Cote d'Ivoire, Ghana and Indonesia to understand their daily lives, behaviours and attitudes through a gender lens and identify key barriers to empowerment. They spoke with young women and adolescent girls as well as influencers and service providers. The findings from the first 'Empathy Generation' phase will be used to inform interventions (van Heck et al., 2020)*

- **Invest in CSA research and gender analysis:** invest in research and development of CSA approaches that increase productivity for farmers and reduce the burden of work through time-saving solutions. Include gender experts and women farmers as part of research and outreach to ensure CSA solutions are appropriate at the local level and are used by women farmers. Ensure findings through farmer outreach also targets women.

  Example: *In the Sahel, degraded lands are usually farmed communally and often given to women's groups to farm. A Bioreclamation project worked with women farmers in Niger to identify new and indigenous techniques - including applying local compost, digging planting pits and trenches and planting high value fruit trees alongside drought-resistant indigenous vegetables. Within three years, the quality of land had been improved and women generated 51% higher incomes than non-participating peers (CGIAR,nd).*
  Example: *Nespresso runs a gender learning programme for 400 agronomists working with over 110,000 farmers in 14 countries. The agronomists work with regional gender trainers over six months to apply gender concepts to their everyday lives, recognise the women's role in coffee production and help facilitate social change (KIT, n.d.).*

- **Ensure change through procurement**: companies should share sustainable dividends through the value chain, increasing the price paid to smallholders for the cost of more sustainable approaches. Increased transparency is required to ensure that smallholders receive increases rather than the intermediaries. For cash crops, most first mile distribution channels are led by male farmers who negotiate the prices with smallholders (van Heck et al, 2020). Gender norms may mean that women are less able to negotiate. Men in the supply chain must be engaged as allies to better support women farmers.

[15] A study in Rwanda found that investment in soil and water conservation almost doubled amongst individuals whose land had been registered. However, it also found that women who were legally married were significantly more likely to have their informal rights documented and secured, indicating disparities amongst women depending on marital status (Ali et al., 2014).

Governments should:

- **Fund research**: women's access to land rights, finance and technology continues to be shaped by unequal power dynamics and gender norms. Ongoing research is required to collect data and shape interventions to address disparities.
- **Support companies to pilot more inclusive approaches to AgTech**: adapting technology solutions to overcome women's barriers to access, including text-free user interfaces, non-mobile solutions and interactive voice response technologies. The UK Government should support companies to pilot and share successful approaches which increase women's ability to access AgTech. This requires contextual understanding of country and commodity specific barriers and including women farmers in solution design.
- **Engage in education and upskilling programmes:** partnering with national governments to support women's participation in STEM (science, technology, engineering, and mathematics). This long-term strategy will increase the number of women scientists and enable women to access roles in research and development of new technologies, including digital solutions and renewable energy products.

  Example: *African Women in Agricultural Research and Development (AWARD), started in 2008 seeks to widen the pipeline of influential Africa women scientists. They invest in African scientists, research institutions, and agribusinesses to deliver agricultural innovations that better respond to the needs and priorities of a diversity of women and men across Africa's agricultural value chains.*

Energy

Energy companies are undergoing perhaps the most significant transformation of all the sectors considered. They are being forced by increasingly stringent regulation and shifting consumer demand to increase the efficiency of energy production as well as diversify and transition products and services. In 2018, the chief executive of Royal Dutch Shell told investors that Shell was no longer an oil and gas group but an "energy transition company" noting the necessity of shifting to a low-carbon energy system (Sheppard and Raval, 2018). Renewable energy, particularly wind and solar, will play an increasingly important role in this shift with 57% of senior oil and gas professionals reporting plans to increase investment in renewables (DNV GL, 2021). BP has pledged to increase its renewable energy generating capacity twenty-fold by 2030 while cutting oil and gas production by 40%.

The transition to net zero is likely to lead to a fundamental restructuring of the energy system, with greater diversification, consumer choice and decentralisation which in turn is likely to have a significant impact on the workforce and consumer. While women represent a slightly higher percentage of the renewable energy workforce compared to traditional energy production, 32% compared to 22% for oil and gas, targeted support is required to challenge existing barriers that prevent women from engaging in the energy sector, such as increasing women's participation in STEM subjects, to translate the potential into actual increases in women's employment (IRENA, 2019).

Below, we set out three megatrends that will shape how the energy sector will transform as it moves towards net zero and the potential impact on the workforce.

Megatrend	Transition to net-zero	Impact on Workforce
 **Rise in renewable energy**	The global energy sector is undergoing a fundamental shift away from fossil fuels and towards renewable energy. Renewable energy solutions are growing faster than any other source as technological advances and falling costs have made renewables cost-competitive in many instances (Geopolitics of Renewables, 2019). According to IRENA, the cost of solar photovoltaics has fallen by 82% over the past decade and offer lower power costs than the cheapest new coal plants. In many countries this will mean a reduction in fossil fuel energy production and replacement by renewables. In economies which are currently dependent on fossil fuel for exports as well as employment this will have a significant impact. In South Africa coal is forecast to drop from 67% of the energy supply in 2014 to 29.7% by 2030, while renewables increase from 5% to 33.3% (Chitonge, 2017).	The energy sector faces perhaps the greatest labour force disruption, with widespread job elimination in extractive industries. Jobs in renewable energy are growing fast and are likely to create equal if not greater numbers of employment opportunities. However, while some job substitution may be possible, the losses and opportunities will not necessarily cluster in the same countries or geographic areas. In 2017, China accounted for 43% of global renewable energy jobs whereas South Africa, with unemployment of 32.5% is facing further unemployment with the transition from coal, but still imports solar photovoltaic products (RES4Africa, 2020). Decent job and human rights issues in renewable value chains must be urgently addressed. China's Xinjiang region, where one million people with Muslim background have been reportedly detained in work camps, produces 40% of global polysilicon production (Swanson and Buckley, 2021). Manufacturing solar panels also requires workers to handle up to 50 highly toxic chemicals which require proper protection to avoid harm (von Hagen and Willems, 2012). Given existing gender segregation in the energy sector, job elimination is anticipated to disproportionately result in male unemployment which must be addressed. The shift to renewable energy also provides an opportunity to redress inequalities in women's representation and expand opportunities for work.
 **Electrification**	The use of electricity in final energy consumption is set to materially increase over the next 30 years, driven by falling carbon intensity as renewables replace coal (bp, 2020). In sub-Saharan Africa, around 590 million people still live without access to electricity. Electrification rates in most countries in sub-Saharan Africa are below 30%, declining to 16% in rural areas, compared to 99% in North African countries and 71% in South Africa (Tagliapietra, 2018). Electrification, preferably powered by renewable sources, remains an important priority across many countries to facilitate economic growth and achieve human development goals. Access can be provided via grid extensions, mini and micro-grids, home systems and clean cooking technologies. **Example:** *Uganda aims to increase access to grid electricity from 24% to 60% of the population over five years. The Rural Electrification Agency includes quotas for women's employment as a requirement for contractors. A gender working group ensures that all projects integrate gender e.g. prioritising electricity for rural hospitals and installing lighting in bathrooms, kitchens and outdoor areas to increase security.*	Understanding the impact on employment from electrification is difficult due to data limitations on existing jobs to provide energy beyond electrification (e.g. kerosene). These jobs are highly informal and existing evidence is limited, with research from Nigeria suggesting that there is no discernible impact on overall jobs from kerosene displacement to electrification[16]. Where electrification leads to job creation, targeted outreach is required to ensure that women are equally able to benefit from these new employment opportunities.

[16] For the economy more broadly, increased access to reliable and affordable electricity has the potential to unlock economic activity and while out of scope for this paper, the impact on induced jobs is significant (Klooss, 2020). Increased access has been found to significantly raise female employment within five years by releasing women from unpaid work and enabling them to earn an income through micro-enterprises (Dinkleman, 2011). Electrification of transport systems may also increase mobility options and if gender analysis is incorporated into the design phase, could increase women's ability to access work opportunities through reduced commuting times and safer transport options.

 **Decentralisation**	Energy production and delivery will move away from traditional energy models, dependent on vertically integrated utility power systems and be replaced by more diverse energy sources (RES4Africa, 2020). In many countries, decentralised energy solutions (including pico-solar appliances, solar home systems, mini-grids, solar water pumps and stand-alone or grid-tied commercial and industrial systems) that harness renewable energy are more appropriate for serving the rural population more quickly and efficiently than extending the national grid. Where a grid provision is in place, decentralised solutions can be used in tandem to bolster the supply and increase capacity while contributing to the net zero transition.	Decentralised energy provision will create significant job opportunities - by 2030, it is estimated that 4.5 million jobs will be created globally across the DRE value chain, including sales, installation, service, appliance, operations and maintenance (Power for all, 2019). The sector is already a significant employer in emerging economies. Between 2017 - 2023 DRE jobs in India, Kenya and Nigeria are set to grow 100%, 80% and 10% respectively. Women account for only a quarter of formal jobs in the DRE sector but play a significant role in informal work, particularly in sales and distribution. In India, women hold 60% of informal jobs in the sector (ibid). Whilst an increase in work opportunities is positive, the quality of work must be considered, including concerns around secure contracts and healthcare. Studies found positive impacts of women's participation in the supply and maintenance of energy with some reporting increased authority and respect in their communities. However, some women still hold negative perceptions of the industry which prevents them from taking roles in the sector, including concerns around the labour intensity of work and requirements to travel to dangerous areas (Power for all, 2019).

Recommendations:

Based on these megatrends, the following recommendations outline actions for key stakeholders to ensure a just transition to net zero.

Companies should:

- **Tailor training design:** Training should support workers transitioning from traditional energy jobs and new entrants to the energy sector. Given the historic barriers to women, tailored training may be required to provide the necessary skills. Technical training should be combined with broader career development, sales and management skills.

  Example: *Ayana Renewable Power, an Indian renewable energy company, co-developed a programme to upskill local workers for operational jobs in a renewable power plant in Andhra Pradesh. The trainers mapped the skills of prospective employees and designed technical and digital training to meet the specific needs. Women's participation was encouraged through the provision of gender-sensitive facilities, including women-only transport and toilets (CDC, n.d).*

- **Develop gender sensitive working practices:** Job roles and ways of working can be tailored to address social norms and overcome barriers to women's participation, including provision of childcare support or travel requirements. Without engaging women to understand what they need and tailoring roles and ways of working to meet their requirements, businesses can risk reinforcing negative perceptions.

  Example: *In Nepal, targeted technical training was designed for women to work as engineers in electricity supply. However, the training did not consider the expectation that married women move to their husband's home after marriage which meant they were no longer able to travel for work. When women did not take up jobs after the training gender stereotypes were reinforced as male participants believed women were "too shy" to work in this sector (Energia, 2019). In contrast,* ***Solar Sisters*** *enables sales agents to set their own distribution target and working model - this may lead to selling to her own village or selling twice a year at harvest time, rather than a wider catchment area.*

- **Set quotas for female recruitment[17]:** Companies could set targets for women's representation and work in collaboration with local communities to recruit and train women.

  Example: *In Kenya Nuru Energy which delivers pay-as-you-go energy systems through village level enterprises introduced all-male, all-female and mixed gender groups to assess the impact of gender quotas. In the past, entrepreneurs were chosen by village leaders which excluded women. The research found that women's participation could be significantly increased (between 10-50%) without any negative impact on profitability (Innovations for Poverty Action, 2019).*

[17] These processes are not all linear and can lead to both positive and negative feedback loops. For example, quotas for female employment may encourage more young women to study STEM subjects and may lead to shifts in social norms. However, some processes should be taken in a linear fashion, such as working practices and tailoring training to support women's success, prior to enforcing quotas. Without setting the right enabling environment, quotas alone can risk reinforcing negative stereotypes if women are set up to fail.

Governments should:

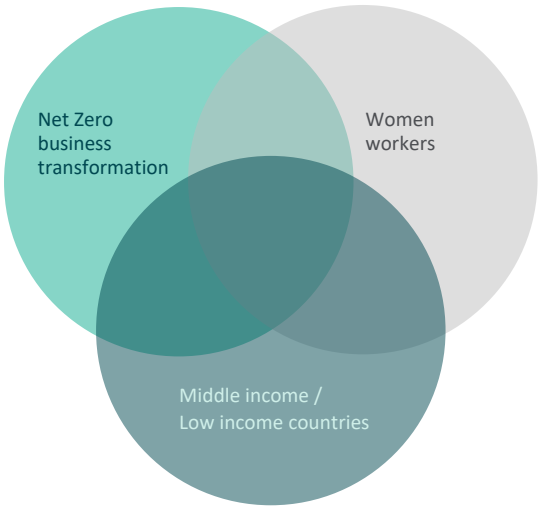
- **Provide suitable access to finance**: gender disparities in the energy industry are exacerbated by lack of financing and investment in female-led renewable energy projects.
- **Example:** *Governments can fund existing initiatives, including tailored accelerators such as ENVenture in Uganda, which adapt venture capital models for female-led businesses and entrepreneurs to support green energy start-ups (ENVenture, 2018). They finance mobile bookkeeping technology, training and coaching women to launch their business, and supporting business from concept to execution.*
- **Lead sectoral discussions on the Just Transition:** the state is often heavily involved in national energy production and should take the lead in identifying 'winners' and 'losers' and introducing policies to mitigate harm. Governments should engage companies, workers, communities, and labour representatives in the net zero transition, from start to finish to ensure equal opportunity for work.
- **Create decent work through industrial strategies:** raise manufacturing capacity in countries which are at risk of significant job elimination in the fossil fuel industry to create jobs, rather than importing renewable products. Ensure proper due diligence and value chain transparency around human rights concerns in manufacturing as well as ensuring proper use of protective equipment whilst working with chemicals.
- **Support initiatives that measure and incentivise responsible business practices:** Governments can provide funding to initiatives that realign business incentives by adopting new and better ways of measuring performance and tackling failures at market and institutional level. This could include work on true cost accounting and socio-economic valuation (including the Capitals Coalition[18] and Value Balancing Alliance) and corporate benchmarking (including the World Benchmarking Alliance).
- **Engage in education:** women's participation in STEM jobs in the renewable sector (28%) remains below non-STEM jobs (35%) and administrative jobs (45%) (IRENA, 2019). This segregation reflects broader challenges around the participation of women in STEM subjects. Governments should increase the number of women graduating in STEM subjects. In turn, companies should showcase female role models in STEM jobs to influence perceptions of women's roles in energy.

[18] The Capitals Coalition seek to understand the impact of natural, human and social capital on organisations' decision making and ability to create value for nature, people and society alongside businesses and the economy

Appendix I: Research Methodology

This briefing has used a sector lens to explore how companies and sectors will adjust their business models to reduce GHG emissions and adapt to shifting global trends. We have selected three sectors; Agriculture, Energy and Garments, to explore the potential impact of the transition to net zero on WEE. These sectors are not an exhaustive analysis of the impact of net zero on WEE but have been used to explore megatrends and their impacts through illustrative examples.

The sectors were selected based on the following criteria:



- **Role in net zero business transformation:** sectors which will play a significant role due to the scale of current emissions or those most likely to see the greatest supply chain decarbonisation.
- **Present in low- and middle-income countries:** sectors with significant supply chain footprint in developing markets and Foreign, Commonwealth & Development Office (FCDO) priority countries.
- **Women workers:** sectors with a high concentration of female workers in their supply chain (whether formal or informal) as well as sectors with high potential for job creation as part of the net zero transition. This briefing will cover both direct and indirect employment but induced employment[19], while significant, will be out of scope.

The findings and recommendations included in this paper are based on the authors' expertise in this area, desk-based research and semi-structured key informant interviews (KIIs). The experts were identified based on PwC and BSR professional networks and interviews were carried out via video conferencing software.

[19] Employment in the wider economy that arises from spending by those employed directly and indirectly, such as local restaurants, stalls and cafes that serve workers (Gregg *et al*, 2015).

With thanks to the following experts who provided suggestions for existing literature or other advice to support this report.

Allyson Thirkell
WG Inclusive

Anders Holst Nymark
Anders Anghild, Ørsted

Callie Strickland
The B Team

Caroline Poschl
Dirk Mostert
Helen Chorlton
Jeaunes Viljoen
Matthew Muller
PwC South Africa

Florence Nsuba
Umeme

Katherine Lucey
Solar Sisters

Kristina Skierka
Power for All

Lydia Hopton
Carmel Mcquaid
M&S

Mehul Gupta
Ravneet Kaur
PwC India

Sam Unsworth
Chalmers University of Technology

Una Hadziahmetovic
Starbucks

Virginie Le Masson
ODI

The content of this report does not reflect the opinions of any of the experts consulted or the organisations that they are associated with.

Appendix II: References

Ali, D., Deininger, K., Goldstein, M. (2014). *Environmental and gender impacts of land tenure regularization in Africa: Pilot evidence from Rwanda.* Journal of Development Economics. https://www.sciencedirect.com/science/article/pii/S0304387813001818

Barrientos, S., Pallangyo, C. (2018). *Global Value Chain Policy Series: Gender.* World Economic Forum. Available from: http://www3.weforum.org/docs/WEF_51129_WP_Global_Value_Chain_Policy_Series_Gender_report_2018.pdf

BCG (2021). *Net-Zero Challenge: The supply chain opportunity.* WEF in collaboration with Boston Consulting Group. Available from: http://www3.weforum.org/docs/WEF_Net_Zero_Challenge_The_Supply_Chain_Opportunity_2021.pdf

BP (2020). *Energy outlook: 2020 edition*. BP. Available from: https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2020.pdf

BSR (2020). *Climate Action in the Value Chain: Reducing Scope 3 Emissions and Achieving Science-Based Targets.* BSR. Available from: file:///C:/Users/929885/Downloads/BSR-Reducing-Scope3-Emissions-Achieving-SBTs.pdf

CDC (n.d). *Ayana Renewable Power Strengthening local skills for a net zero economy*. CNC Group. Available from: https://www.cdcgroup.com/en/story/ayana-renewable-power/

Cargill (2018). *The shifting global dairy market.* Available from: https://www.cargill.com/doc/1432126152938/dairy-white-paper-2018.pdf

Ceres2030 (2020). *Ending Hunger Sustainably: The role of gender.* Ceres2030. Available from: https://ceres2030.org/wp-content/uploads/2020/08/ceres2030-en-background-note-ending-hunger-sustainably-the-role-of-gender.pdf

CGIAR (n.d). *Bioreclamation to secure women's rights to land.* CGIAR. Available from: https://www.cgiar.org/innovations/bioreclamation-to-secure-womens-rights-to-land/ [Accessed on: 08.03.2021].

Chitonge, H. (2017). *The Political Economy of Energy Policy in South Africa: From a Gender Agenda to a Class Project.* Energia. Available from: https://www.energia.org/assets/2018/07/Political-economy-of-energy-policy-in-South-Africa.pdf

Dinkelman, T. (2011). *The Effects of Rural Electrification on Employment: New Evidence from South Africa.* The American Economic Review. Available from: https://www.jstor.org/stable/41408731?seq=1

DNV GL (2021). *Turmoil and Transformation: The outlook for the oil and gas industry in 2021.* DNV GL. Available from: https://industryoutlook.dnv.com/2021/download

Ellen MacArthur Foundation (2017). *A New Textiles Economy: Redesigning Fashion's Future.* Ellen MacArthur Foundation. Available from: https://www.ellenmacarthurfoundation.org/assets/downloads/A-New-Textiles-Economy_Full-Report_Updated_1-12-17.pdf

Energia (2019). *Women's empowerment and electricity access: how do grid and off-grid systems enhance or restrict gender equality?* Energia. Available from: https://www.energia.org/assets/2019/04/RA1-Womens-empowerment-and-electricity-access.pdf

Energia (n.d). *Exploring factors that enhance and restrict women's empowerment through electrification.* Energia. Available from: https://www.energia.org/project/research-project-1-exploring-factors-that-enhance-and-restrict-womens-empowerment-through-electrification/

ENVenture (2018). *ENVenture: Annual Report 2018.* ENVenture. Available here

EUEI (2013). *Gender Briefing Notes Supporting active inclusion of women in energy and development projects*. European Union Energy Initiative Partnership Dialogue Facility (EUEI PDF). Available from: http://file:///C:/Users/kmurphy079/Downloads/150824_euei_broschuere_gender_en_rz_04_web.pdf

Fabregas, R., Kremer, M. and Schilbach, F. (2019). Realizing the potential of digital development: The case of agricultural advice. *Science*, 366(6471). Available from: https://science.sciencemag.org/content/366/6471/eaay3038?utm_campaign=toc_sci-mag_2019-12-12&et_rid=293396612&et_cid=3121433

FAO (2010). *Gender dimensions of agricultural and rural employment: Differentiated pathways out of poverty*. Rome: UN. Available from: http://www.fao.org/3/i1638e/i1638e.pdf

FAO (2011). *The State of Food and Agriculture: Women in Agriculture.* Rome: UN. Available from: http://www.fao.org/3/i2050e/i2050e.pdf

FAO (2013). *Tackling Climate Change through Livestock*. Rome: UN. Available from: http://www.fao.org/3/i3437e/i3437e.pdf

FAO (2020). *FAO policy on gender equality 2020–2030*. Rome: UN. Available from: http://www.fao.org/3/cb1583en/cb1583en.pdf

FAO (2021). *Nature-based solutions in agriculture :The case and pathway for adoption*. Virginia: The Nature Conservancy. Available from: http://www.fao.org/3/cb3141en/cb3141en.pdf

Gap Inc. (2020). *500,000 Women and Girls Complete Gap Inc.'s Global Education and Life Skills Training Program.* Gap. Available from: https://www.gapinc.com/en-us/articles/2020/02/500,000-women-and-girls-complete-gap-inc-s-global-

Gatticchi, G. (2020). *Energy Transition Threatens 120,000 South African Coal Jobs*. Bloomberg. Available from: https://www.bloomberg.com/news/articles/2020-11-04/renewable-energy-drive-threatens-120-000-south-african-jobs.

Geopolitics of Renewables (2019). *A New World: The Geopolitics of the Energy Transformation.* Global Commission on the Geopolitics of Energy Transformation. Available from: http://geopoliticsofrenewables.org/assets/geopolitics/Reports/wp-content/uploads/2019/01/Global_commission_renewable_energy_2019.pdf

Gregg, C., Stritska0Ilina, O., Budke, C. (2015) *Anticipating skill needs for green jobs: a practical guide.* ILO. https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_564692.pdf

GSMA (2020). *Connected Women the Mobile Gender Gap Report 2020*. UKAID. Available from: https://www.gsma.com/mobilefordevelopment/wp-content/uploads/2020/05/GSMA-The-Mobile-Gender-Gap-Report-2020.pdf

H&M (2020). *Recycling System 'Looop' Helps H&M Transform Unwanted Garments into New Fashion Favourites.* H&M. Available at: https://about.hm.com/news/general-news-2020/recycling-system--looop--helps-h-m-transform-unwanted-garments-i.html

IEA (2021). *Global Energy Review: C02 Emissions in 2020.* IEA. Available from: https://www.iea.org/articles/global-energy-review-co2-emissions-in-2020 [Accessed on: 08.03.2021].

IISD (2019). *India's Energy Transition: Stranded coal power assets, workers and energy subsidies.* IISD, Global Subsidies Initiative and ODI. Available from: https://www.iisd.org/system/files/publications/india-energy-transition-stranded-coal-power-assets_0.pdf

ILO (2018). *World Employment and Social Outlook 2018 – Greening with jobs*. Geneva: International Labour Office. Available from: https://www.ilo.org/weso-greening/documents/WESO_Greening_EN_web2.pdf [Accessed 8 March 2021].

ILO (2020). *Jobs in a net-zero emissions future in Latin America and the Caribbean*. Washington D.C. and Geneva: Inter-American Development Bank and International Labour Organization. Available from: https://www.ilo.org/global/about-the-ilo/newsroom/news/WCMS_752088/lang--en/index.htm [Accessed 3 March 2021].

ILO (2020a). *World Employment and Social Outlook: Trends 2020*. Geneva: International Labour Office. Available from: https://www.ilo.org/wcmsp5/groups/public/---dgreports/---dcomm/---publ/documents/publication/wcms_734455.pdf [Accessed 23 February 2021].

ILO (2020b). *The supply chain ripple effect: How COVID-19 is affecting garment workers and factories in Asia and the Pacific.* ILO. Available from: https://www.ilo.org/wcmsp5/groups/public/---asia/---ro-bangkok/documents/briefingnote/wcms_758626.pdf

Innovations for Poverty Action (2019). *Female microenterprise creation and business models for private sector distribution of low-cost off-grid LED lighting: Multiple Randomized Experiments.* Energia. Available form: https://www.energia.org/assets/2019/04/RA5-Female-microenterprise-creation.pdf

International Renewable Energy Agency (2019). *Renewable Energy and Jobs - Annual Review 2019.* IRENA. Available form: https://www.irena.org/publications/2019/Jun/Renewable-Energy-and-Jobs-Annual-Review-2019

IPCC (2019). *Food Security. In: Climate Change and Land: an IPCC special report on climate change, desertification, land degradation, sustainable land management, food security, and greenhouse gas fluxes in terrestrial ecosystems*. UN. Available from: https://www.ipcc.ch/site/assets/uploads/sites/4/2021/02/08_Chapter-5_3.pdf [Accessed 3 March 2021].

Keane, J., Mendez-Parra, M., Pettinotti, L., Sommer, L. (2021). *The climate and trade nexus in Africa. ODI.* https://www.odi.org/sites/odi.org.uk/files/resource-documents/climate_trade_nexus_v7.pdf

KIT (n.d.) *Introducing catalysts for gender transformative change.* KIT Royal Tropical Institute. Available from: https://kit.exposure.co/catalysts-for-gender-transformative-change

Klooss, B. (2020). *Does electrification create jobs? The evidence in low- and middle-income countries.* Energy and Economic Growth. Available from:

https://energyeconomicgrowth.org/sites/eeg.opml.co.uk/files/2020-04/EEG%20Energy%20Insight%20electrification%20create%20jobs.pdf

Miralles-Wilhelm, F. and Iseman, T. (2021). *Nature-based solutions in agriculture – The case and pathway for adoption.* Virginia. FAO and The Nature Conservancy. Available from: http://www.fao.org/3/cb3141en/cb3141en.pdf

Keane, J., Mendez-Parra, M., Pettinotti, L., Sommer, L. (2021). *The climate and trade nexus in Africa.* ODI. Available from: https://www.odi.org/sites/odi.org.uk/files/resource-documents/climate_trade_nexus_v7.pdf

Keating, C. (2020). *Study: Around 2.2 million UK workers need reskilling for net zero transition.* Business Green. Available from: https://www.businessgreen.com/news/4017076/study-million-uk-workers-reskilling-net-zero-transition [Accessed on 08.03.2021]

Lazo, L. and Fernandez-Mendoza, M. (2018). *Skills for Green Jobs in Philippines.* ILO. Available from: https://www.ilo.org/wcmsp5/groups/public/---ed_emp/---ifp_skills/documents/publication/wcms_706951.pdf

Livelihoods Funds *(2021). Philippines: bringing more benefits to 5,000 coco farmers – Livelihoods Funds.* Livelihoods Fund. Available from: https://livelihoods.eu/portfolio/resilient-coconut-supply-chain-and-improved-income-philippines/ *[Accessed 8 March 2021].*

McKinsey (2018b) *How the global supply landscape for meat protein will evolve.* McKinsey. Available from: https://www.mckinsey.com/industries/agriculture/our-insights/how-the-global-supply-landscape-for-meat-protein-will-evolve

McKinsey (2018a). *Is apparel manufacturing coming home?* McKinsey & Company. Available from: https://www.mckinsey.com/~/media/McKinsey/Industries/Retail/Our%20Insights/Is%20apparel%20manufacturing%20coming%20home/Is-apparel-manufacturing-coming-home_vf.pdf

McKinsey (2020). *Agriculture and climate change*. McKinsey & Company.Available at: https://www.mckinsey.com/~/media/mckinsey/industries/agriculture/our%20insights/reducing%20agriculture%20emissions%20through%20improved%20farming%20practices/agriculture-and-climate-change.pdf [Accessed 3 March 2021].

Mercy Corps (2019). *Climate-Smart Agriculture: Solar Powered Pumps Empower Women Farmers/* Mercy Corps AgriFin. Available from: https://www.mercycorpsagrifin.org/2019/04/18/climate-smart-agriculture-solar-powered-pumps-empower-women-farmers/# [Accessed 8 March 2021].

Montt, G. and Luu, T. (2019). *Does Conservation Agriculture Change Labour Requirements? Evidence of Sustainable Intensification in Sub-Saharan Africa.* Available here.

Olam (2019). *Olam International Limited Annual Report 2019*. Olam. Available from: https://www.olamgroup.com/content/dam/olamgroup/investor-relations/ir-library/annual-reports/annual-reports-pdfs/olam-annual-report-fy19_3-in-1.pdf [Accessed 23 February 2021].

Palma, S. (2018) *Indonesia keeps faith with coal to meet growing energy demand*. Financial Times. Accessed on 23/02/2021. Available at: https://www.ft.com/content/0fd3ed3e-89b9-11e8-affd-da9960227309

PARM (2019). *Study on gender in Agricultural Risk Management Analytical framework and operational guidelines*. Rome: PARM/IFAD. Available from: https://www.p4arm.org/app/uploads/2019/07/PARM_Gender-in-ARM_May2019-1.pdf [Accessed 3 March 2021].

Power for all (2019). *Powering Jobs Census 2019: The Energy Access Workforce.* Power for All, Schneider Foundation and the Rockefeller Foundation. Available from: https://www.powerforall.org/resources/reports/powering-jobs-census-2019-energy-access-workforce

PwC (2020). *How AI can enable a Sustainable Future*. PwC. Available from: https://www.pwc.co.uk/sustainability-climate-change/assets/pdf/how-ai-can-enable-a-sustainable-future.pdf [Accessed 23 February 2021].

PwC (2020b). *Economie circulaire: Une voie de transformation de l'industrie textile vers un monde durable?* PwC. https://www.strategyand.pwc.com/fr/fr/assets/pdf/2021/01/fr-france-strategyand-etude-economie-circulaire-et-textile.pdf

PwC (2020a). *Net Zero Economy Index 2020: The Pivotal Decade*. London. Available at: https://www.pwc.co.uk/sustainability-climate-change/net-zero-2020/the-net-zero-economy-index-2020.pdf

Renewable Energy Solutions for Africa Foundation (2020). *A Just Energy Transition in South Africa: Socio-economic needs and the positive impacts of a future low-carbon economy.* RES4Africa Foundation. https://www.res4africa.org/wp-content/uploads/2020/09/RES4Africa-Foundation-A-Just-Energy-Transition-in-South-Africa.pdf

Reuters (2021). *South Africa's unemployment rate jumps to new record high.* Reuters. Available from: https://www.reuters.com/article/us-safrica-economy-unemployment-idUSKBN2AN0S1

Sadowski, M., Yan, C., Cummis, C., Aden, N. (2019). *Apparel and Footwear Sector: Science-Based Targets Guidance*. Science Based Targets Initiative. Available from: https://sciencebasedtargets.org/resources/legacy/2019/06/SBT_App_Guide_final_0718.pdf

Schroder, P. (2020). *Promoting a Just Transition to an Inclusive Circular Economy.* Chatham House. Available from: https://www.chathamhouse.org/sites/default/files/2020-04-01-inclusive-circular-economy-schroder.pdf

Sheppard, D. and Raval, A. (2018). *Oil producers face their 'life or death' question.* Financial Times. Available from: https://www.ft.com/content/a41df112-7080-11e8-92d3-6c13e5c92914. [Accessed on 05.03.21].

Slavin, T. (2019). *How AB InBev is using blockchain to improve the lives of smallholder farmers.* Reuters. Available from: https://www.reutersevents.com/sustainability/how-ab-inbev-using-blockchain-improve-lives-smallholder-farmers

Sprechmann, S. (2020). *COVID-19 is the biggest setback to gender equality in a decade.* World Economic Forum. Available from: https://www.weforum.org/agenda/2020/07/gender-equality-women-employment-covid19/. [Accessed on 08.03.2021].

Starbucks (2018). *5 Things to Know about Starbucks Coffee Farm, Hacienda Alsacia.* Starbucks. Available at: https://stories.starbucks.com/stories/2018/5-things-to-know-about-starbucks-farm-hacienda-alsacia/#:~:text=Purchased%20in%202013%2C%20Hacienda%20Alsacia,and%20working%20farm%20for%20Starbucks

Starbucks (2020). *Reaffirming Starbucks commitment to a resource-positive future*. Starbucks. Available from: https://stories.starbucks.com/press/2020/reaffirming-starbucks-commitment-to-a-resource-positive-future/ [Accessed 8 March 2021].

Swanson, A. and Buckley, C. (2021). *Chinese Solar Companies Tied to Use of Forced Labour.* The New York Times. Available from: https://www.nytimes.com/2021/01/08/business/economy/china-solar-companies-forced-labor-xinjiang.html

Tagliapietra, S. (2018). *Electrification in sub-Saharan Africa: The role of international institutions.* Bruegel. https://www.bruegel.org/2018/09/electrification-in-sub-saharan-africa-the-role-of-international-institutions/#:~:text=Africa%27s%20access%20to%20electricity%20varies,(86%20per%20cent)%20electrified

Textile Exchange (2020). *Preferred Fibre & Materials: Market Report 2020.* Textile Exchange. Available from: https://textileexchange.org/wp-content/uploads/2020/06/Textile-Exchange_Preferred-Fiber-Material-Market-Report_2020.pdf

The B Team (2018). *Just Transition: A business guide.* Just Transition Centre and The B Team. Available from: https://bteam.org/assets/reports/Just-Transition-A-Business-Guide.pdf

UNFCCC (n.d). *Race to Net Zero Campaign.* UNFCCC. Available from: https://unfccc.int/climate-action/race-to-zero-campaign [Accessed on 09.03.2021]

Unilever (2020). *How we will improve the health of our planet.* Unilever. Available from: *https://www.unilever.com/news/news-and-features/Feature-article/2020/climate-and-nature.html [Accessed 23 February 2021].*

Van Heck, P., Laven, A., Vos, A. (2020). *The Resilience Journey: Empathy Genderation (Phase 1).* KIT Royal Tropical Institute. Available from: https://www.mars.com/sites/g/files/jydpyr316/files/2020-12/The%20Resilience%20Journey%20Empathy%20Generation%20%28Phase%201%29.pdf

Vivid Economics (2021). *Greenness of Stimulus Index.* Vivid Economics & Finance for Biodiversity. Available from: https://www.vivideconomics.com/wp-content/uploads/2021/01/201214-GSI-report_December-release.pdf

Von Hagen, M. and Willems, J. (2012). *Women's participation in green growth - a potential fully realised?*. Green Growth Working Group and Donor Committee for Enterprise Development. Available from: https://www.enterprise-development.org/wp-content/uploads/Womens_participation_in_Green_Growth.pdf

WBCSD (2021). *Digital Climate Advisory Services (DCAS) for smallholder resilience*. WBCSD. Available from: https://www.wbcsd.org/contentwbc/download/11227/165626/1 [Accessed 3 March 2021].

WEF (2020). *The Net-Zero Challenge: Fast-Forward to Decisive Climate Action*. World Economic Forum. Available at: http://www3.weforum.org/docs/WEF_The_Net_Zero_Challenge.pdf

Wilding, R. (2020). *Coronavirus Is Changing Global Supply Chains in Unexpected Ways.* Brink. Available from: https://www.brinknews.com/coronavirus-is-changing-global-supply-chains-in-unexpected-ways/ [Accessed on 10.03.2021]

World Bank (2019). *World Development Report: The Changing Nature of Work.* The World Bank. Available from: http://documents1.worldbank.org/curated/en/816281518818814423/pdf/2019-WDR-Report.pdf

World Bank (2019a). *Improving Energy for Agricultural Competitiveness in Mexico*. The World Bank. Available from: https://www.worldbank.org/en/results/2019/05/10/improving-energy-for-agricultural-competitiveness-in-mexico [Accessed 3 March 2021].