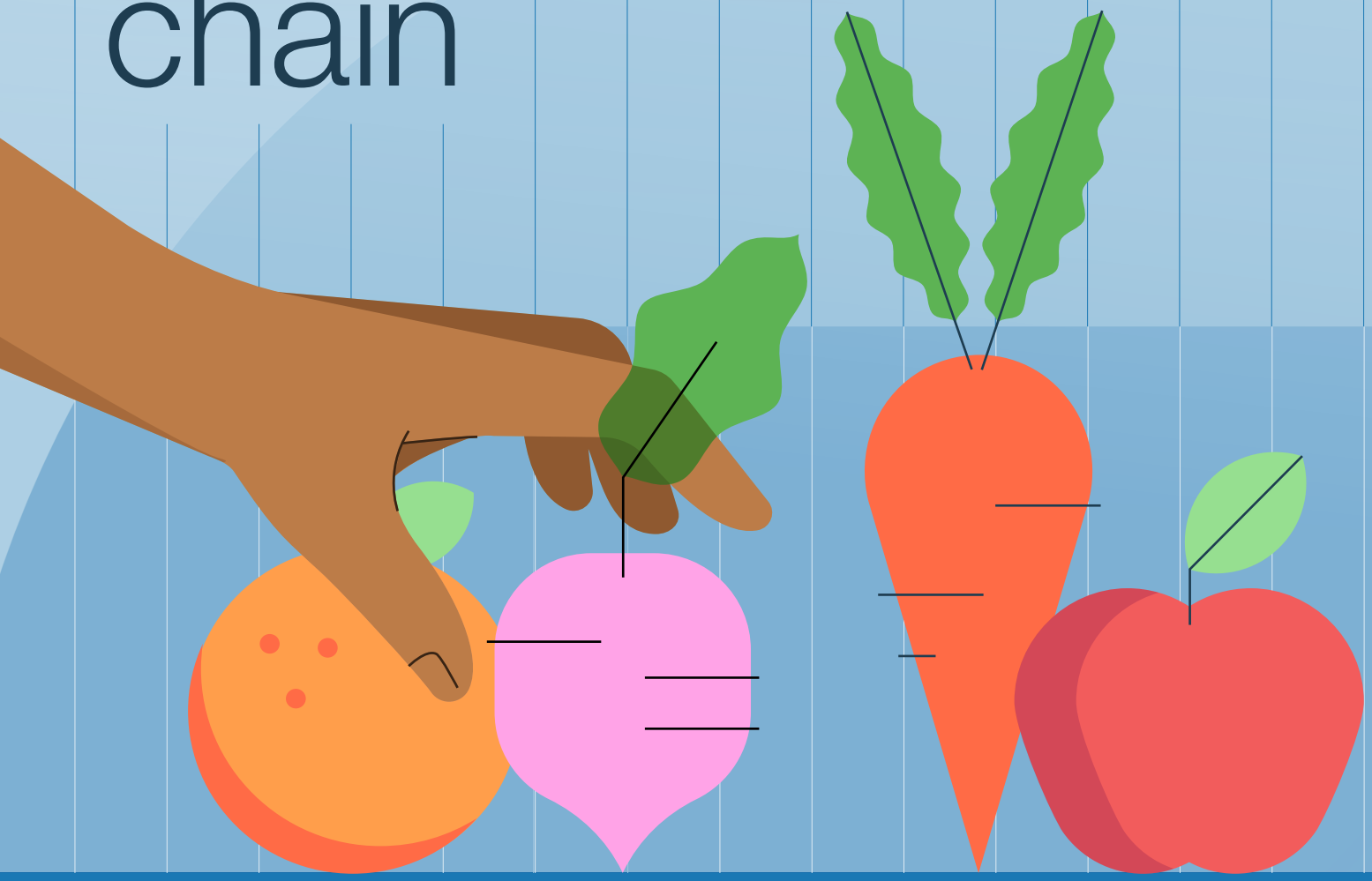
A just transition in food:

Impacts on workers in the food supply chain



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Laudes Foundation

Laudes Foundation is an independent foundation that supports brave action to inspire and challenge industry to transition to a green, fair and inclusive economy. We are driven by the belief that business, when guided by values, rules and incentives, can be powerful agents for positive change. Our approach combines the catalytic power of philanthropy to work with and through business and industry to advance system change.

We focus on driving a just transition in four key industries with outsized impact on climate change, nature loss and inequality: built environment, finance and capital markets, fashion and food. Across these industries, we have cross-cutting programmes in labour rights and narratives, and support initiatives to unlock capital for transitions across all industries.

Founded by the Brenninkmeijer family business owners, Laudes Foundation builds upon six generations of entrepreneurship and philanthropy, working collaboratively alongside a wider network of philanthropic organisations.

Dalberg Advisors

Dalberg Advisors is a strategic advisory firm that combines the best of private sector strategy skills and rigorous analytical capabilities with deep knowledge and networks across emerging and frontier markets. We work collaboratively across the public, private, and philanthropic sectors to fuel inclusive growth and help clients achieve their goals, providing an innovative mix of services — advisory, investment, research, analytics, and design — to create impact at scale. Our global perspectives are firmly rooted in local realities. We have 28 offices across the world and have served clients in more than 135 countries. By combining local knowledge and international experience, our strategies blend the best global ideas and innovations with the local practicalities and partnerships needed for effective implementation.

Löning Human Rights & Responsible Business

Löning – Human Rights & Responsible Business is an international management consultancy specialised in sustainability and human rights. Founded in 2014, the firm provides practical and strategic advisory to help companies and organisations integrate respect for human rights into their operations and value chains. Its multinational team brings together diverse professional backgrounds, regional expertise, and a strong commitment to positive social impact.

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I. Foreword

As global temperatures rise, food systems are at a critical inflection point. Limiting warming to 1.5°C requires profound shifts not only in how we produce food, but also in how we consume it. Demand-side changes—like shifting diets and reducing waste—are powerful but underused tools in tackling the climate crisis. However, the impacts of changing consumer demand on agri-food workers and their communities remain poorly understood. Laudes Foundation aims to inspire and challenge industry to transition to a green, fair, and inclusive economy. We commissioned the research underlying this report to examine how the shifts in food consumption and production needed to cut greenhouse gas emissions affect the millions of workers who sustain the global food system. The report explores current labour conditions, challenges, and opportunities for high carbon-emitting commodities, and how these may change as the food systems evolves. The intersection of these concerns has attracted surprisingly little study to date; we hope this report sparks greater knowledge sharing, debate, and data generation in this critical area.

Geopolitical forces influence trade, labour policies, and regulatory frameworks, which directly impact workers' rights and conditions across the food supply chain. In Europe and the US, the early 2020s saw heightened political focus on climate, sustainability, and labour rights—though support for these concerns varied across regions. Despite—and in some cases because of—these evolving dynamics, pursuing a just transition for food system workers is more urgent than ever. This report focuses on long-term drivers and implications (particularly for workers) of a just transition, and how stakeholders in the US, UK, and EU advance a just transition to a net zero food system over the next 5 to 15 years.

This research reveals that climate-beneficial shifts will impact the livelihoods of already marginalised workers in livestock production, commodity farming, and food processing—especially if the transition is not proactively managed or does not centre worker inclusion, agency, and accountability. However, it also highlights clear opportunities. With strong corporate and government accountability, policy support, investment, worker protections, and inclusive planning, the transition to net zero can create new, high-quality jobs in sustainable plant agriculture, regional food processing, and alternative proteins.

We hope this report will spur bold action across food value chains—from worker movements to corporate boardrooms to policy forums—that embraces the full potential of demand-side shifts while ensuring a fair distribution of both responsibility and benefits.

> The path to sustainable food systems requires nothing less than reimagining the way we produce and consume food, with workers and livelihoods at the centre of this essential transformation.
>
> — Laudes Foundation

i. "Food system" comprises all the activities and processes involved in getting food from farm to fork, including food production (including agriculture), manufacturing, distribution, preparation, and consumption.

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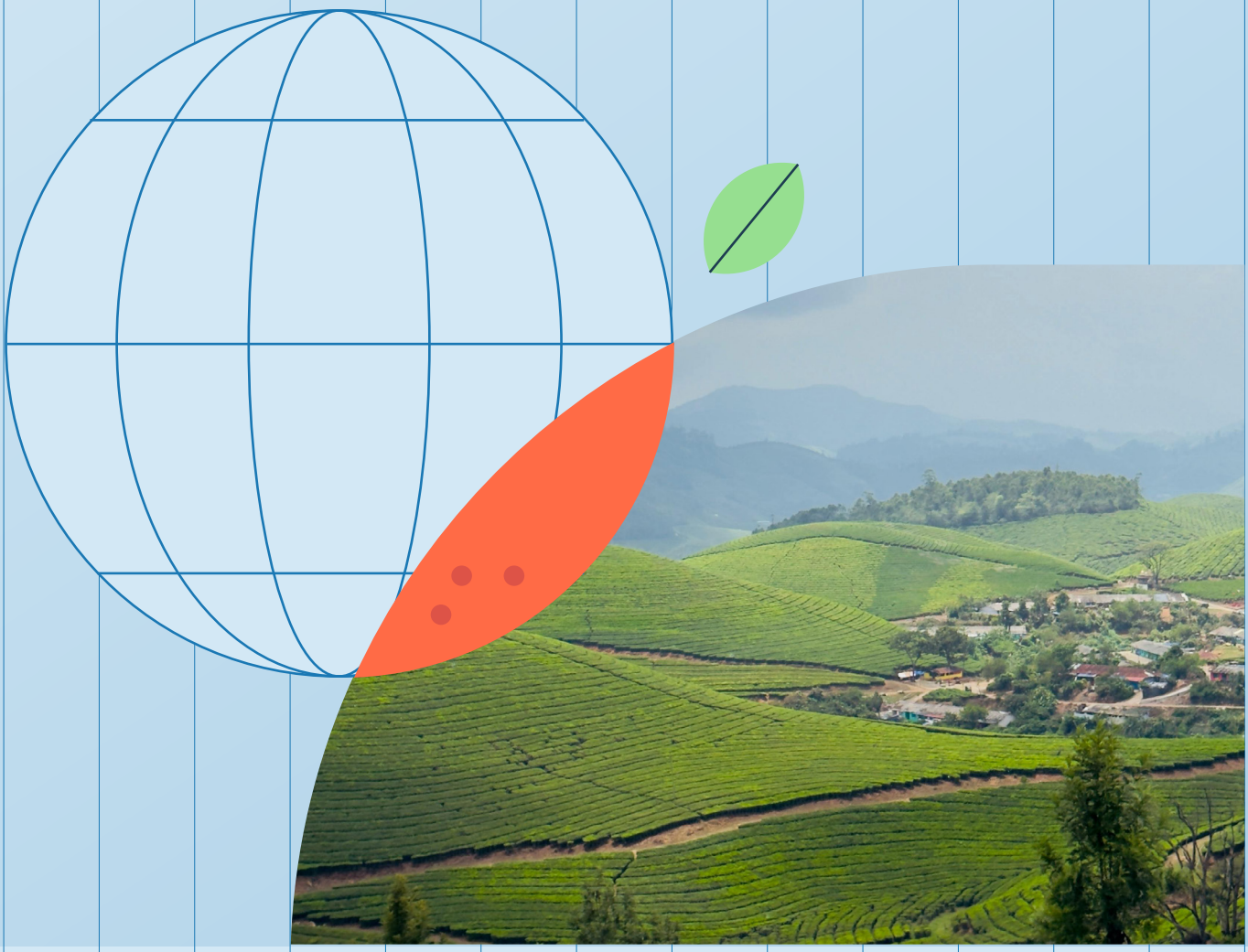
I. Why the world needs a just transition to a net zero food system



Part 1 – The food system's need to transition to net zero

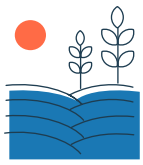
The world urgently needs to transition to a net zero food system to avoid the worst impacts of climate change. Action in the European Union (EU), United Kingdom (UK), and United States (US) is critical to this transition.

This report focuses specifically on the EU, UK, and US, home to many of the world's largest food producers and food manufacturers. These enterprises produce a significant share of global food and have substantial CO_2 footprints, especially in their supply chains.[1,2,3] The EU, UK, and US food systems are collectively responsible for 15% of global food emissions due to the amount of food produced and consumed in these regions.[4,5,6]

Progress to date to reduce the food system's greenhouse gas (GHG) emissions (accounting for one-third of global GHG emissions[7]) has fallen short of the scale of reduction required to reach net zero goals. Global emissions must decrease by 43% by 2030 from 2005 levels to meet the targets set by the Paris Agreement, in line with the EU's Effort Sharing Regulation.[8] Yet GHG emissions from agriculture have remained broadly flat since 2005.[9,10,11]

Three different levers are critical to achieving a net zero food system: 1) increasing the spread of sustainable food production practices, 2) reducing food loss and waste, and 3) shifting demand towards lower-emission foods.[12]

Figure 1: Key levers for a net zero food system



1. Sustainable food production

Adopting more sustainable agricultural practices to reduce GHG emissions, biodiversity loss, and environmental degradation due to overuse of water and fertilizers.

2. Reduction of food waste and loss

Minimising food waste at all stages—production, manufacturing, distribution, and consumption—to cut emissions from food decomposition and improve overall resource efficiency.

3. Demand shift to lower emission food

Transitioning to sustainable diets, such as the EAT-Lancet Planetary Health Diet, by increasing intake of lower-emission food sources such as plant-based food and reducing intake of higher-emission food sources such as red meat and dairy.

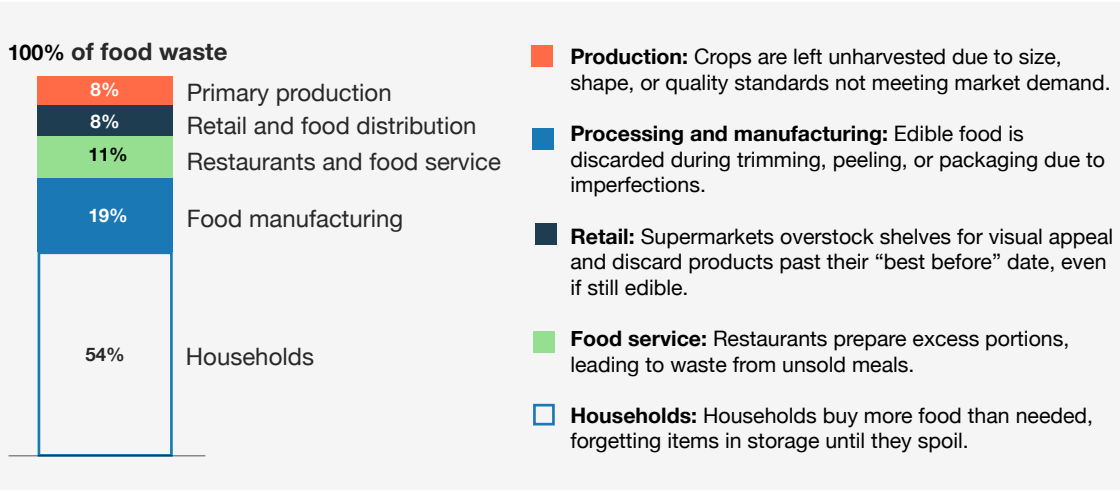
1. A transition to more sustainable production methods will be needed to keep the food system within planetary boundaries for GHG emissions, pollutants, and land degradation.

A shift in agricultural practices could reduce GHG emissions, biodiversity loss, and environmental degradation due to overuse of water and fertilizers.[13] Total annual agricultural emissions in the EU could be cut by 25% if farmers transitioned to sustainable agricultural practices, such as crop covering and rotation, agroforestry, and optimised use of fertilizers.[14] Low-herbicide and no-till farming and cover cropping can reduce cropland use by 10–25%, freeing up more land for other uses.[15,16] Other practices—such as increased seed diversity and tree planting—help farmers adapt to climate change by reducing the risk and impact of local flooding and the chances of total crop failure due to droughts, pests, or disease.[17]

2. To reach net zero in the food system, food waste and loss need to be halved, in line with the Sustainable Development Goals (SDG 12.3).[18]

For every two calories consumed in the US today, an additional calorie of food is wasted.[19] Waste occurs at every stage of the supply chain, from households (54% in EU) to manufacturing (19% in EU) and food service (11%; see Figure 2 below).[20]

Figure 2: Share of total EU food loss and waste by supply chain stage (%)[21]



3. The Lancet Commission model shows that shifting consumption away from high-emission products can reduce food emissions globally by up to 49% by 2050 and will be necessary to meet net zero targets.[22]

Animal products generate higher emissions than plant-based alternatives—beef, for example, generates 100 times more emissions per 1,000 kcal than legumes.[ii,23,24] In the EU, US, and UK today, animal protein accounts for 45–55% of daily food consumption by weight[iii,25] and per capita meat consumption remains among the highest in the world.

The EAT-Lancet Commission created an alternative diet, the "Planetary Health Diet" (PHD), which lowers emissions (while still ensuring nutritional adequacy) by introducing major shifts in US and European consumption patterns for seven commodity groups and reducing caloric intake.[26] The PHD would increase the consumption of legumes by 700% and fruits and vegetables by 30–60%, and reduce the consumption of red meat (90%), poultry (60–80%), and dairy (55–60%).[27]

ii. Per capita meat consumption: global: 63 kg, US: 149 kg, EU: 104 kg, UK: 100 kg in 2021. Source: Our World in Data and FAO Per capita meat consumption by type, 2021.
iii. Animal proteins include milk, red meat, poultry, seafood, and eggs.

Figure 3: Difference between current consumption and the EAT-Lancet Planetary Health Diet for the US and EU by food type (grams)[28]

	US	EU
Cereals (grains)	-22%	-32%
Legumes	+706%	+681%
Red meat	-93%	-92%
Poultry	-82%	-58%
Dairy	-61%	-55%
Vegetables	+76%	+36%
Fruits	+38%	+20%

The EAT-Lancet diet represents a change in mix and volume of food consumed, while maintaining nutritional adequacy. As presented here, it does not include any food waste, whereas the current diet for the US and EU includes post-retail food waste, slightly inflating consumption.

This report focuses on demand-side shifts in the food system for three reasons: (i) they hold significant potential for emissions reduction, (ii) they have wide-reaching impacts across employment in the food system, and (iii) policymakers and business leaders have paid relatively little attention to them thus far.

Demand-side shifts hold major potential for cutting emissions. Reducing consumption of high-emission foods is essential to meeting net zero goals. The Lancet Commission estimates that this change alone could cut global food emissions by 49% by 2050.[29]

Such shifts will reshape the food industry and substantially impact workers in the affected commodities in the EU, UK, and US. With approximately 80% of beef, poultry, and milk produced in the UK and US consumed domestically, labour impacts will be felt locally, while increased consumption of fruit, vegetables, and pulses is likely to create new jobs.[30,31,32,33,34,35] Reduced feed production will further impact domestic employment: in the US, corn makes up more than 95% of feed grain production, nearly all of it grown and used domestically; in the EU, approximately 75–77% of feed protein is locally sourced.[36,37]

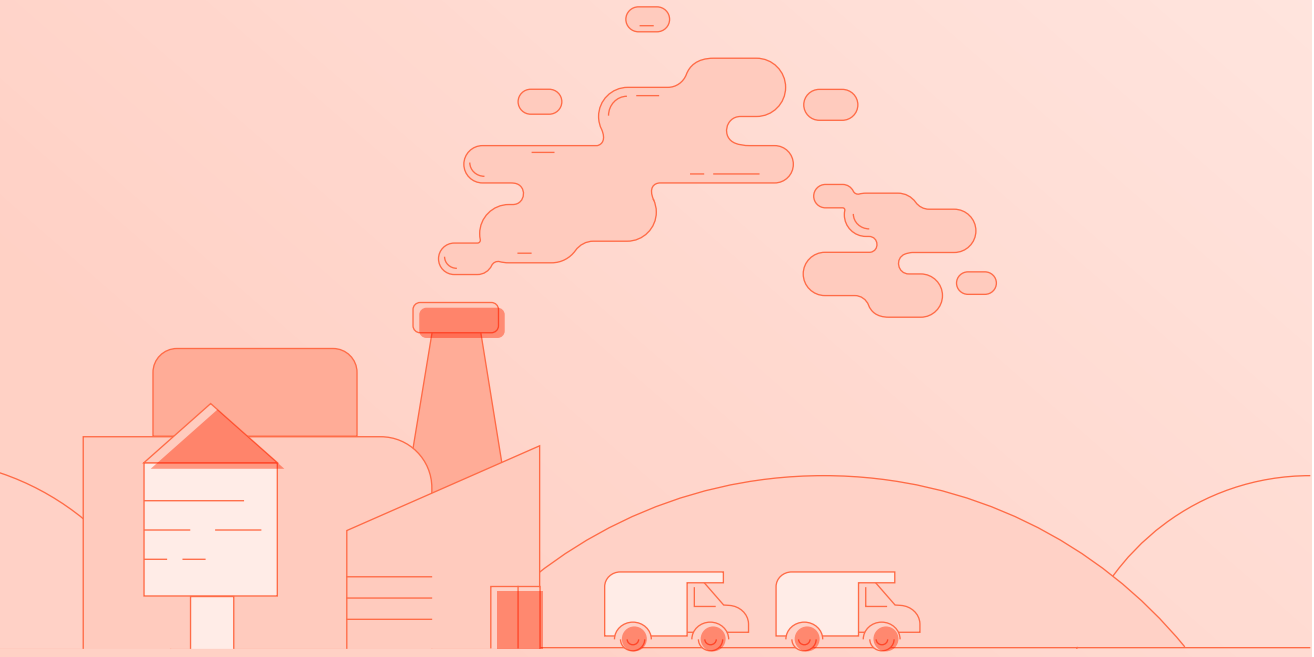
Over the long term, demand-side changes in the US, EU, and UK will likely influence global supply chains—reducing demand for animal feed in Latin America and boosting demand for plant-based proteins elsewhere. Despite growing consumer interest in plant-based foods, demand-side shifts remain largely overlooked by policymakers, businesses, and researchers, especially in planning for a just transition to a net zero food system.

While UK plant-based sales grew 40% between 2014–2019 and US sales doubled between 2017–2023, most emission-reduction efforts still focus on making current, meat-heavy diets more sustainable.[38,39,40] FAIRR, a global network of food investors, found that only 20% of food manufacturers and retailers recognise protein diversification as a strategy for addressing climate risk.[41] This report aims to shed more light on this shift and its impacts for food system workers, and to provide data to inform policy- and decision-making.

Why are businesses so critical to the transition towards net zero?

A handful of companies, due to their significant market share and influence, will largely shape the transition. The ten largest global food manufacturers (by revenue) operate in more than 200 countries, employing 1 million workers directly and many more across their supply chains.[42] In food retail, the UK's top six retailers control over 80% of the market, while the top five in the US account for over 55% of grocery sales.[43,44] The sourcing and pricing policies of these businesses have an outsized effect on food workers—whether driving improvements in wages and working conditions or undermining labour and environmental standards.

Many companies are already pursuing net zero goals and have a strategic interest in ensuring a just transition. All ten of the largest global food manufacturers have set net zero targets, and many are adjusting strategies accordingly.[iv,45,46] Consumers—particularly younger demographics—increasingly prioritise sustainability in their purchases; 75% of US Gen Z consumers value sustainable products over brand names and 62% prefer buying sustainable brands.[47,48] Early movers in emission reduction have gained market share—in 2014, Mühle became the first major German meat company to offer plant-based alternatives, capturing 40% of Germany's meat alternatives market in 2025.[49]



iv. Of the top ten largest global food manufacturers, seven have validated net zero targets through the Science Based Targets initiative (SBTi) and the remaining three have established science-based greenhouse gas reduction targets.

Part 2 – The need for a just transition in the food system

We rely on food system workers for a secure and resilient food system. Across the US, EU, and UK, around 54 million people (15% of total employment) work in food production, manufacturing, sales, and service.[v,50] The stability and wellbeing of this workforce are critical to ensuring the resilience and productivity of the overall food system. As plans to decarbonise the food system take shape, we need to understand the key actors who will play a significant role in shaping the transition and / or will be impacted by it.

Definition of Workers

Workers include all individuals engaged in labour across the food system—from production to retail—encompassing both formal and informal employment, as well as documented and undocumented workers.

We expect that the transition to net zero will have a direct impact on food system workers. The transition can create secure jobs, boost rural economies, and strengthen supply chains. However, the benefits are unevenly distributed. Certain regions, industries, and socio-economic groups, especially those already disadvantaged, face greater risks of job loss or exclusion from emerging opportunities.

It is critical to ensure that the transition is just, delivering inclusion and agency for workers and accountability for employers. A just transition maximises the benefits and minimises the challenges for workers at each step of the journey towards achieving a net zero food system. The International Labour Organization (ILO) defines a just transition as both a process and an outcome:

> *A just transition means greening the economy in a way that is as fair and inclusive as possible to everyone concerned, creating decent work opportunities and leaving no one behind. A just transition involves maximizing the social and economic opportunities of climate action, while minimising and carefully managing any challenges—including through effective social dialogue among all groups impacted, and respect for fundamental labour principles and rights.*[51]

Ensuring a just transition requires focusing on three core principles: 1) inclusion, 2) agency and 3) accountability.[52] In a just transition, workers are included in and granted the agency to shape and inform the decisions and conditions that impact them.[53] Companies and governments, meanwhile, are accountable for protecting workers' rights; upholding ILO labour standards; ensuring fair treatment of workers as industries transition; and supporting long-term economic stability.[54] They also need to be transparent about their actions and strategies as they work towards these goals to ensure that others can hold them accountable.[55]

Without explicitly embedding inclusion, agency, and accountability, transitions in any industry risk disproportionately harming already marginalised groups. History shows us that workers in precarious jobs often suffer most from economic disruption. The decline of US manufacturing in the Rust Belt between 1950 and 1980, for example, cut manufacturing jobs by ~34%, triggering mass unemployment and economic decline.[56,57] Understanding who will be most impacted by this transition is key to ensuring that the principles of inclusion, agency, and accountability are championed by all stakeholders. This report therefore focusses on understanding how workers

v. Due to data limitations, the 54 million workers referenced here account only for documented workers across production, manufacturing, wholesale, retail, and food service.

might be impacted by the transition and subsequently identifying ways stakeholders can support the achievement of a just transition.

Embedding the values of inclusion, agency, and accountability into the transition is also critical to securing much-needed worker support. For example, in Denmark, trade unions were able to partner with non-governmental organisations (NGOs) and the government to provide healthier, more climate-friendly and organic meals in public kitchens during the 2010s.[58] By contrast, failing to ensure that transitions are 'just' can fuel disenfranchisement and stoke workers' fears, slowing progress and deepening inequality. In 2024, European farmers fearing their livelihoods were at risk protested against environmental regulations they felt were imposed without consultation. These demonstrations stalled climate initiatives and heightened tensions between policymakers and food workers, delaying effective transition measures.[59,60]

What does the just transition mean for businesses?

As critical stakeholders in the food system, businesses are exposed to both the opportunities and risks of the transition to net zero. A just transition can help businesses manage worker-related risks and access opportunities that employee inclusion and agency brings.

Managing workforce risk will allow businesses to reduce operational challenges and build economic resilience. Failing to engage suppliers and their workers can lead to labour disputes and reputational risks. For example, Taco Bell faced a high-profile, four-year national campaign and boycott led by the Coalition of Immokalee Workers (CIW) demanding better wages and working conditions for farmers and farmworkers.[61] In 2005, Taco Bell ultimately met all of the CIW's demands.[62] Similarly, overreliance on seasonal labour weakens supply chains and increases price volatility, reducing business resilience. In 2022, UK farm labour shortages left ~£22 million worth of crops un-harvested[63] and drove up food prices.[64,65]

Worker-centred transition initiatives show how inclusive engagement can advance sustainability goals while improving working conditions today. Arla Foods, a major European farming cooperative, created a Sustainability Incentive model involving over 8,500 farmer-owners in shaping climate targets. The programme offers financial rewards for practices like feed efficiency and renewable energy use, mobilising €500 million annually towards emission reduction.[66]
In 2023, Riverford, a direct-to-consumer organic fruit and vegetable company in the UK, transitioned to full employee ownership, with more than 1,000 employee-owners. The company saw employee retention and satisfaction rise—demonstrating the commercial and cultural value of worker-centred transitions.[67]

II. The baseline: Working conditions today for food workers

Labour rights are at risk in many countries and many food workers face poor working conditions. A just transition requires not only protecting workers, but also meaningfully including them in decision-making and providing them the support, resources, and agency needed to help shape the transition.

Labour rights, which are foundational to a just transition, are at risk to varying degrees across the UK, US, and EU.

National scores from the Löning Country Risk Register Data reflect the general regulatory and enforcement environment for labour rights. These include risks of unequal treatment, threats to freedom of association, and inadequate working conditions (with 0 being low and 100 being high risk). Countries with relatively high risk scores for unequal treatment include Cyprus (66) and Hungary (62), whereas countries with the highest scores in risk to freedom of association include Greece, Hungary, the UK, and the US (with a score of 67 in each case). Bulgaria (37), Greece (37), and Croatia (38) rank among the highest in wage adequacy risks; France (44), Belgium (36), and Estonia (36) rank the highest in health and safety risks.

Food workers face long hours, low wages, and physical and psychological hazards—and many conditions are intensifying due to climate change.

Food workers work longer and more anti-social hours than most workers. Long or atypical working hours (e.g., weekends, evenings, night shifts) are common across the industry.[68,69,70]

Many food workers also earn low wages and are subject to unfair and unlawful pay practices. Inconsistent enforcement of national regulations and limited social protections (especially for seasonal and hourly workers) can leave food workers with take-home pay that falls well below national minimum wage, and limited or no benefits.[71,72] In the US, food industry jobs are often excluded from national minimum wage protection due to inconsistent or non-existent state-level regulation.[vi,73]

> “There are a few places, not many, who pay the minimum wage. But in the majority of the cases, they take it from somewhere else—for example, travel costs.”
>
> – Food worker, Almería, Spain
>
> Source: Ethical Consumer (2023) Produce of Exploitation

Wage theft (withholding of earned benefits, such as breaks or compensation) is widespread in food systems—particularly in agri-food supply chains that employ high shares of migrant and seasonal workers—and exceeds levels in other industries. Workers in US food systems, for example, faced an average of seven times more wage and hour violations than those in all non-food industries between 2010–2023.[74]

Food workers also face a wide range of physical and psychological hazards—some of which are intensifying due to climate change, while others stem from structural issues within the food system:

vi. In California, overtime for agricultural workers was gradually introduced starting in 2019; by 2022, any farmworker working more than 8 hours per day or 40 hours per week had to receive overtime compensation.

- Exposure to weather extremes and climate hazards, especially for workers working outside or in greenhouses. Heat stress is projected to affect over 70% of global agricultural production by 2045.[75,76,77,78,79]

- Exposure to hazardous chemicals and zoonotic diseases—infectious agents transmitted from animals to humans—in agricultural or processing settings.[80,81]

- Unsafe production speeds or cold exposure in industrial food processing facilities, resulting in injuries and sickness.[82]

- Psychological stress due to psychologically challenging environments (such as slaughterhouses), including higher prevalence rates of mental health issues, such as depression and anxiety, compared to workers in other professions.[83]

Migrant, seasonal, and undocumented workers are the backbone of the food system, yet they face the highest risks of exploitation due to legal precarity and employer dependence.

Migrant, seasonal, and undocumented workers are disproportionately represented in food industry roles (especially during seasonal peaks) and are more vulnerable to exploitative working conditions. In the US, 86% of food workers are immigrants[84] and undocumented workers make up approximately 45% of the agricultural sector.[85,86]

Migrant workers face heightened risks of forced labour and modern slavery. Often recruited by labour intermediaries and lacking formal employment contracts, migrant workers are at risk of debt bondage or restrictive visa schemes that make it difficult to leave exploitative jobs.[87,88,89] Moreover, migrant workers often depend on employers for housing and transportation and may have little choice but to accept crowded, unsafe facilities and substandard services—or even do without essential services.[90,91]

Social protections are limited or not available for migrant workers. In the US, for example, undocumented migrant workers are not eligible for unemployment benefits.[92]

> “As soon as we would enter, we would start to tear up.… It was really strong. We felt like we were getting sick—your throat, nose.… One pregnant woman went to ask what chemicals they were using and what [the chemicals would] do to [her] child [but the company] said that it was within the permitted standards.… Their solution is to say: ‘If you don’t want to stay here, go.’”
>
> – Poultry processing worker, US
>
> Source: Human Rights Watch (2019) “When We’re Dead and Buried, Our Bones Will Keep Hurting”

> “One skill that you master while working at an abattoir is disassociation. You learn to become numb to death and to suffering. Instead of thinking about cows as entire beings, you separate them into their saleable, edible body parts. It doesn’t just make the job easier—it’s necessary for survival.”
>
> – Slaughterhouse worker, UK
>
> Source: BBC (2020) Confessions of a slaughterhouse worker

> “They would say, ‘If you don’t pick fast enough, or if you don’t meet the quality standards, or if you make a mistake, we’ll cancel your visa, send you back to your country, or apply wage deductions as punishment.’”
>
> – Crop worker, UK
>
> Source: The Bureau of Investigative Journalism (2023) Migrant workers tell parliament of discrimination and cruelty

Today's evolving geopolitical context in the EU, UK, and US poses increasing challenges for migrant workers looking to enter and remain in the country of employment. As the fear of deportation for undocumented immigrant workers grows, so, too, does their dependence on employers and their reluctance to report labour rights violations.

The minority of workers who are women and youth face further challenges.

Women—who make up 20–35% of agricultural workers in the EU, UK, and US—face added challenges such as gender-based violence and unequal pay.[93,94,95] Despite widespread reports of sexual harassment and abuse, many cases go un-investigated, reinforcing a cycle of impunity.[96] For example, in 2018 and 2019, Moroccan migrant women in Spain's strawberry industry reported severe exploitation and sexual abuse, but authorities failed to act.[97]

Youth and child workers also face serious risks due to power imbalances and gaps in legal protections. In the US, children as young as twelve can work unlimited hours in agriculture (outside of school hours and with parental consent). Roughly 600,000 US agricultural workers are under the age of 18[98] and may face hazards like pesticide exposure, extreme heat, and dangerous machinery—risks banned for children in other industries.[99,100] Between 2003 and 2016, child agriculture workers accounted for over half of work-related child deaths in the US.[101]

Workers are often excluded from decisions that affect them, lack the power to drive change, and have to navigate systems that fail to protect their rights or hold violators accountable.

Many food workers—especially migrant and seasonal workers—lack access to unions or other mechanisms for collective representation. Less than 10% of food workers in the US, EU, and UK are unionised.[102] This is linked to language barriers, seasonal employment, limited support for organising, and legal restrictions on collective bargaining for short-term or undocumented workers.[103,104]

In response, worker-led groups such as the HEAL Food Alliance in the US or Asociación de Mujeres Immigrantes AMIA in Spain have emerged to support non-unionised food workers.[105,106] However, such organisations often lack formal bargaining rights under labour law, which limits their ability to negotiate binding contracts.[107]

Even when included in discussions, workers often lack the power, protection, or resources to challenge unfair conditions, leaving them vulnerable to exploitation and retaliation. Fear of dismissal or blacklisting discourages them from organising or raising concerns—workers who reported violations have been fired on the spot.[108] Formal whistleblower protections and complaint mechanisms are often weak or inaccessible.[109]

Despite evidence of human rights violations, governments and businesses often fail to enforce worker protections or take responsibility for poor conditions in food supply chains. Enforcement is frequently under-resourced or ineffective.[110] Widespread subcontracting limits visibility into the supply chain and makes addressing labour issues in lower tiers of the supply chain challenging for buyers.[111] Meanwhile, private certifiers, increasingly relied upon for oversight, are not held sufficiently accountable when they miss violations, further weakening worker protection.[112]

III. The change: A net zero scenario for food workers' jobs and working conditions

Overall findings

This chapter presents a preliminary assessment of how the transition to net zero will affect food system workers.

Given future uncertainties, it does not offer precise forecasts about job quality or workforce numbers. Rather, it highlights where the most immediate and significant opportunities and challenges for workers will emerge during the transition—and therefore where support should be directed. Understanding the nuances of this complex topic is a critical priority for the field; we encourage other organisations to build on this initial analysis.

Our findings show that the transition to net zero can affect workers unevenly. While some could benefit from new jobs and improved conditions, others could face worsening conditions and job displacement. Certain commodities and supply-chain stages could be more affected than others, making it essential to identify where the most significant displacement and opportunities will arise.

Opportunities and displacement need to be considered separately, as most displaced workers will not seamlessly transition into other food system roles and may need to shift to new industries. In those cases where displaced workers can access new food system roles—such as dairy production lines repurposed for plant-based alternatives—employer support is vital to helping workers transition.

This chapter first considers the impacts of all net zero levers alongside broader factors shaping the food system. However, the analysis of job numbers focuses on demand shifts, which are expected to drive workforce changes over the next 5–15 years.

Demand changes

In the medium term, demand shifts from high- to low-emissions products are expected to drive the most significant employment change across the food system. These shifts affect both the scale and structure of production, influencing labour needs across the supply chain, from farm to factory. New studies—including those from The Lancet Planetary Health, IDDRI, and Stockholm Environment Institute—have begun to quantify how dietary transitions may impact employment across commodities in specific regions.[113,114,115] The most positively impacted commodities could see more than a fivefold increase in production; the most negatively impacted could see production decline by approximately 95%.

The impact of demand shifts on working conditions will largely depend on how the transition is managed. For example, in shrinking sectors, cost-cutting could worsen conditions for remaining workers, reducing benefits and job security.

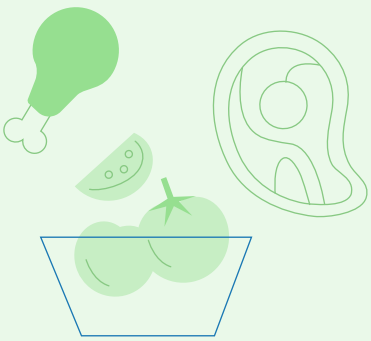
What about sustainable agriculture?

A move towards more sustainable production practices may positively impact job numbers, but this outcome remains highly uncertain. In the short term, the impact of this transition is expected to be smaller than the impact of demand shifts. Transitioning to more sustainable production practices—such as soil restoration, ecological management, and biodiversity conservation—may temporarily increase labour demand for new skills, but studies indicate that short-term changes to job numbers will be minimal in developed countries.[116] Over the long term, a broader shift to local, artisanal food production could significantly increase labour intensity and create more jobs. This remains a distant and uncertain outcome, however. As such, this chapters' quantitative analysis does not consider the impact of sustainable production on future job numbers. We welcome further research on this subject.

Regardless of the impact on job numbers, sustainable practices should improve working conditions, even in the short term. Reduced use of hazardous agrochemicals will lower farmworkers' exposure to toxic substances, decreasing the risks of acute and long-term health impacts.[117,118] If a significant shift occurs towards a more local and artisanal food system, higher wages for food workers could follow.[119]

What about the impact of food waste reduction?

Reducing food waste has a smaller, more evenly distributed impact on the food system compared to demand shifts. Halving today's 30% food waste would cut food production, processing, retail, and consumption by 15%. Meeting this target by 2050 would equate to a 9% decrease over the next 15 years. While this could lead to commensurate job losses, many food waste reduction methods—such as surplus redistribution—actually increase labour intensity. The resulting short- to medium-term job loss is expected to be less than 5%.[120,121,122] As such, this chapters' quantitative analysis excludes the effect of food waste reduction on job numbers; we encourage further research on this impact pathway.



Food waste reduction, particularly through circular economy practices such as upcycling, is expected to marginally improve working conditions. Lower volumes of spoiled or discarded food in retail, food service, and processing facilities should reduce worker exposure to unsanitary or hazardous materials, leading to safer workplaces.[123,124]

Beyond net zero, what other factors will impact workers?

The transition to net zero will take place within the context of a food system that is already evolving and being impacted by macro-trends such as automation and AI solutions, changing migration patterns and trade flows, more frequent extreme weather events, and greater climate variability—all of which are expected to affect employment numbers, locations, and conditions.

Many physical tasks common in food and agriculture lend themselves to automation—an estimated 20–30% of jobs in the sector are at risk of being automated out of existence over the medium-to-long term.[125,126] However, automation may also benefit workers by, for example, reducing exposure to dangerous working conditions and substances.[127]

At the same time, growing climate change impacts—such as droughts and floods—are expected to increase significantly the health and safety risks faced by food system workers.

We discuss these factors below in the section on changes to working conditions but exclude them from the analyses of job opportunity and displacement due to uncertainty around how they will manifest. Further research is needed to understand how these factors will interact with demand shifts.

Potential impact on job numbers

Limitations of the analysis and methodological note

A rapid pace of change is needed to achieve the demand shifts required by the Planetary Health Diet (PHD). The change relies on international, parallel action across the value chain, from producers to consumers. Given the uncertainty around progress on these fronts, the report examines two different scenarios for the evolution of demand shifts: an "ambitious medium-term" transition (5–15 years), which is the focus of the report, and a "longer-term net zero scenario" (>15 years).

- The **ambitious medium-term scenario** represents ambitious but realistic progress towards the PHD, requiring an accelerated pace of transition compared to current trends. It assumes reduced demand for high-emission products like red meat and dairy and increased consumption of plant-based alternatives like legumes, fruits, and vegetables. Calorie intake remains unchanged, with a 15–25% shift towards the product mix of the PHD. This scenario excludes impacts of sustainable production and food waste reduction due to the high degree of uncertainty surrounding the rate and scale at which they will take place.

- The **longer-term net zero scenario** (15+ years) models the impacts on workers of full adoption of the PHD by EU, US, and UK consumers, both in product mix and lower calorie intake. Like the medium-term scenario, it excludes sustainable production and food waste reduction impacts due to uncertainty.

vii. This approach is based on the modelling framework developed by Mason-D'Croz et al., whose study found that a 42.5% decline in cattle output was associated with a 44.1% reduction in employment—validating the near-linear relationship; Mason-D'Croz, Daniel et al. (2022) Ethical and economic implications of the adoption of novel plant-based beef substitutes in the USA: a general equilibrium modelling study

This analysis represents a high-level, order-of-magnitude assessment only, and includes the following limitations:

- **Closed food system (no trade adjustment):** Reductions in domestic demand for high-emission foods (e.g., red meat) are not offset by increased exports. This simplified scenario assumes that all countries transition to net zero simultaneously and excludes the employment impacts of potential export growth.

- **Commodity group modelling (no crop-by-crop modelling):** The analysis models impact of the transition at the level of seven key commodity groups only, not specific crops. It does not account for seasonal variability in production intensity or labour demand.

- **Demand–output–employment relationship (1:1:1 assumption):** In the absence of trade effects, changes in consumer demand are assumed to lead to proportional changes in output and employment.[vii,128]

- **Stable population figures:** The forecast assumes flat populations, meaning food demand due to population size remains steady. This roughly aligns with projections for the EU (population peaking in 2025, decreasing by 1% by 2050) and US (6% growth from 2025 to 2055).[129]

- **Job estimates:** Estimates of the current number of workers in the food system are based on statistics data (~54 million workers in the US, UK, and EU). The estimated job losses do not include undocumented workers, which are estimated to account for 5–9% of all workers in the food system.[130]

A MEDIUM-TERM SCENARIO

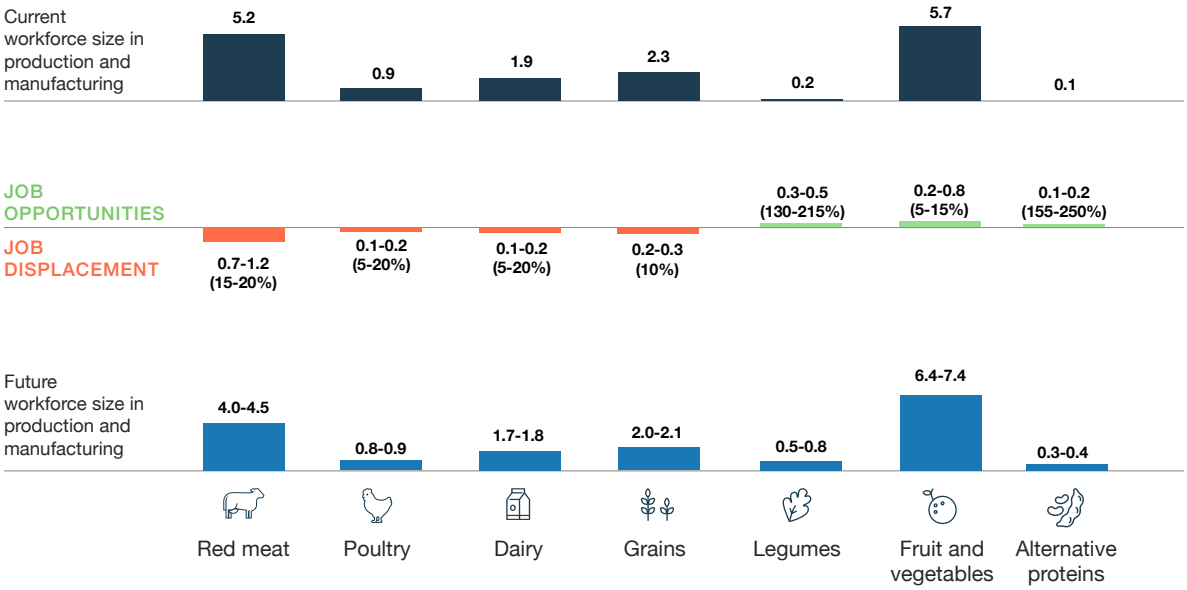
Over the next 5–15 years, adopting the Planetary Health Diet is expected to generate approximately 1–3 million new jobs and displace 1–2 million jobs in the EU, UK, and US, out of a total of 54 million food system jobs. Although this appears 'net neutral', impacts will vary by value chain and region, requiring targeted support and reskilling for impacted workers.[131]

- Job opportunities and displacements are highly concentrated in the seven commodity groups most affected by demand shifts (see Figure 4 below).

- Job growth will be concentrated in fruit and vegetable, legumes, and alternative protein value chains, which will see an increase from approximately 6 million jobs today to 7–9 million jobs in 15 years (20–45% growth).[132]

- Most job displacements could occur in the meat, poultry, dairy, and grain value chains, which will shrink from roughly 10 million jobs today to 8–9 million (a ~10–20% decrease), driven by reduced demand for high-emission foods (beef, poultry, dairy) and lower livestock feed production.[133]

Figure 4: EU, UK, and US workforce in the seven most impacted commodities: prediction under the accelerated demand scenario in 5–15 years (millions)[134]



Impact of job opportunities and displacement across the value chain

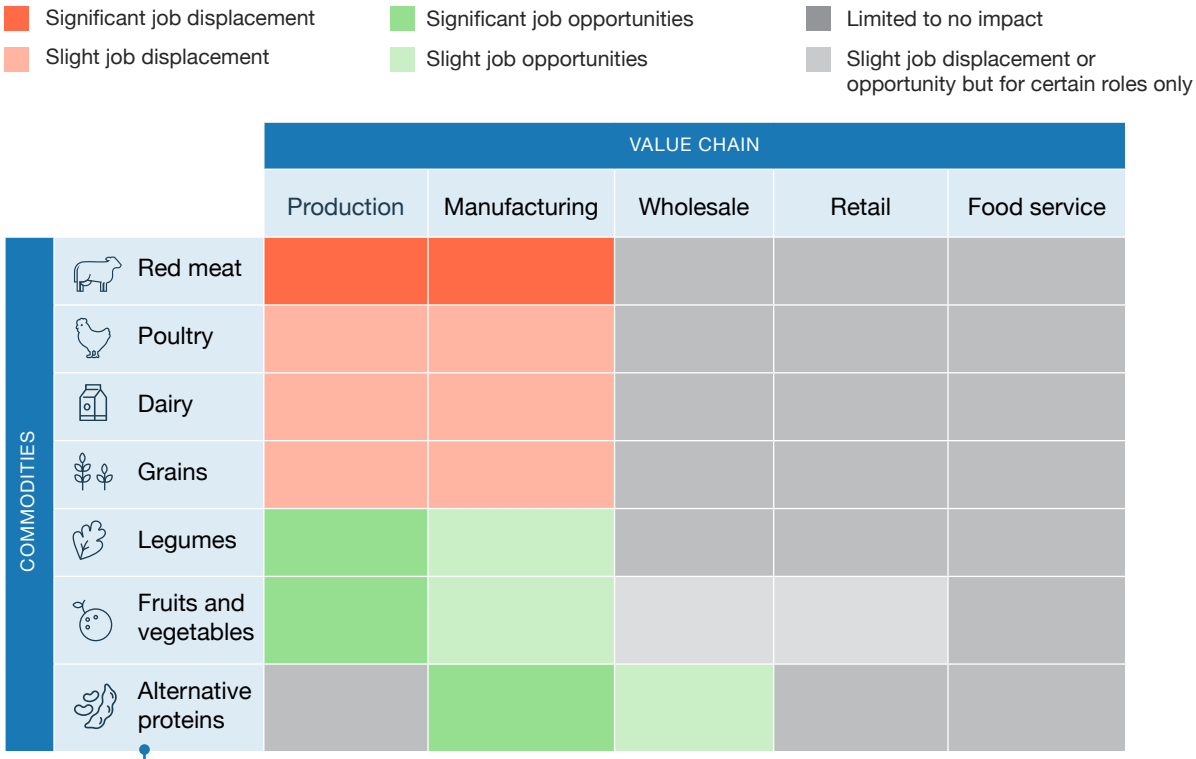
Most changes due to demand shifts will occur in production and manufacturing, where many roles are closely tied to specific commodities. Wholesale, retail, and food service jobs will be less affected—except for specialised roles like butchers—since they typically span multiple commodities and allow for easier product substitution (see Figure 5).

- Primary production will see both job creation and displacement, depending on the commodity. Livestock farming and animal feed production face high displacement risks due to reduced meat and dairy demand. Affected roles may include livestock / cattle farmworkers, breeding technicians, and feed crop operators. Meanwhile, expanded fruit, vegetable, and legume farming will create jobs for field labourers, supervisors, irrigation technicians, and horticultural specialists.

- Food manufacturing will undergo similar shifts. Specialised meat and dairy processing plants—especially single-purpose facilities—will likely see job displacement for industrial butchers, meat cutters, carcass trimmers, and dairy technicians. In contrast, processing of alternative proteins, legumes, and other plant-based foods will expand, driving demand for fermentation engineers, biochemists, and food scientists.

Wholesale, retail, and food service roles will remain relatively stable due to their cross-commodity nature. A supermarket worker, food delivery driver, or restaurant manager can adapt to customers' preferences for beef, beans, or tofu. However, without retraining, some specialised roles—such as meat counter staff in supermarkets—may face job losses.

Figure 5: Level of exposure to job opportunities and job displacement due to demand shifts, by commodity and supply chain stage[135]



Note: Alternative proteins do not rely on traditional production—they use existing crops (e.g., soy, peas) or are made in bioreactors. As a result, they create few new production jobs. Instead, they drive job growth in manufacturing (e.g., food tech, processing plants) and distribution (e.g., cold-chain logistics), where new infrastructure and skills are needed to scale.

B LONG-TERM NET ZERO SCENARIO

Achieving a fully net zero food system (>15 years) would generate over four times more job changes than the medium-term scenario, reflecting the greater demand shifts required. See Figure 6 for a detailed breakdown.

The full Planetary Health Diet scenario produces an estimated 7–8 million job displacements and 4–6 million job opportunities—a change in workforce size up to seven times greater than in the "ambitious medium-term" scenario. Displacements remain concentrated in production and manufacturing of meat, dairy, and grains, while opportunities emerge primarily in the production and manufacturing of legumes, vegetables, and alternative proteins.[136]

These figures are illustrative, intended to highlight the scale of transformation rather predict specific outcomes, given the degree of uncertainty across a greater than 15-year timeline.[137]

Figure 6: Job changes by transition scenario[138]

Job gains and losses are shown separately, as they impact different workers and do not offset each other

		Ambitious medium-term scenario (5–15 years)	Long-term net-zero scenario (>15 years)
Overall impact on employment in the US, EU, and UK	JOB GAIN	1–3 million	4–6 million
	JOB LOSS	1–2 million	7–8 million
% change in employment across red meat, poultry, dairy, grains, legumes, fruits and vegetables, and alternative proteins in the EU, UK, and US (16 million workers)	JOB GAIN	5–15%	20–35%
	JOB LOSS	5–10%	45–50%
% change in employment across the total food workforce in the EU, UK, and US (54 million workers)	JOB GAIN	2–5%	7–11%
	JOB LOSS	2–3%	14–15%
Red meat	% CHANGE IN NUMBER OF JOBS BY COMMODITY	-15 to -20%	-90% to -95%
Poultry		-5 to -20%	-60 to -80%
Dairy		-5 to -10%	-55 to -60%
Grains		-10%	-50 to -70%
Legumes		150–260%	>500%
Fruits and vegetables		10–30%	30–60%
Alternative proteins		175%–295%	>500%

In long-term modelling, automation has a more significant impact—growing from displacing 8–12% of jobs in the medium term to 20–30% in the long-term scenario.

Potential impact on working conditions

The transition to net zero is expected to improve conditions for some workers, providing social, emotional, and physical benefits through more rewarding roles and reduced toxic exposure.

- Roles that allow workers to contribute to sustainability goals—such as chefs preparing plant-based meals—may increase workers' pride and sense of purpose.[139] Research from Denmark has shown that healthier, organic, and climate-friendly menus in public kitchens can boost job satisfaction by 54% and reduce sick days.
- Food waste reduction can improve occupational health by limiting exposure to spoiled food, creating safer environments across the supply chain.[140,141] For example, Tesco's 2018 "Colleague Shops" initiative redistributed surplus food to charities and employees, reducing food waste and providing 128 million meals to date.[142,143,144]
- More sustainable production methods—such as diversified cropping and soil regeneration—can also improve working conditions by reducing exposure to harmful chemicals and providing more stable, year-round employment. A study of nearly 9,000 crop fields across California's Central Valley found a 27% reduction in high-toxicity pesticide use after farms adopted sustainable practices.[145]

Regardless of the pace of transition, climate hazards, automation, and AI solutions will significantly impact workers.

- Climate hazards will increasingly pose challenges, especially for those who work outdoors or in warehouses with limited temperature control. US agricultural workers are already 35 times more likely to die from heat stress than are workers in other sectors.[146] Extreme heat, unpredictable weather, wildfires, and flooding heighten the risks of heatstroke, illness, and job insecurity (such as in California, in 2023, when flooded strawberry farms forced workers to evacuate and pause their jobs for several weeks).[147]
- Automation and AI will lower the demand for manual labour but also reduce workplace hazards in what has long been a high-risk sector. In the UK and US, some farmers have invested in strawberry-picking robots, which minimize worker exposure to physical strains from stooping for long hours in hot conditions, but also reduce the need for manual labour (thus replacing workers).[148]

Over time, greater climate volatility, technological disruption, and changing production models will increase income precarity and physical risk to workers. Large-scale reskilling and adaptation support will be needed to avoid deepening social and economic inequalities.

What do these changes mean for workers?

Many food system workers will require targeted reskilling to adopt net zero practices. While some will access new opportunities through their employers, many displaced workers will not find new opportunities within the food system without tailored, place-based assistance. Improvements in working conditions—particularly in growing sectors like fruits and vegetables—are also needed to protect vulnerable workers and prevent worsening labour violations.

Reskilling is critical for jobs in sustainable agriculture, food waste reduction, and the production of newly in-demand foods. More sustainable agricultural practices require training in soil management, biodiversity conservation, and carbon sequestration.[149] Manufacturing new, plant-based food commodities also requires specialised training. Circular economy practices—including surplus food redistribution, composting, and upcycling—will reshape work in retail, food service, and logistics. Some practices require only minimal training, but specialised reskilling will be needed for others.[150,151,152] Higher-skilled roles may also lead to wage increases.[153]

However, new food system jobs often do not emerge in the same communities where displacement occurs. For example, highly fertile areas for the cultivation of crop-based commodities often do not overlap with areas dedicated to large-scale livestock production. Approximately 65% of cattle grazing land is unsuitable for crop production due to terrain type and soil degradation.[154] In addition, primary processing sites for perishable crops such as soft fruits are typically located near production zones to limit food loss.[155]

Timing also matters—job displacement and job creation rarely align across independent value chains. Workers in shrinking industries may face displacement before nascent industries (such as plant-based foods, alternative proteins, or low-emission food production) scale up, thus limiting their opportunities to work elsewhere. Workers who are displaced later, on the other hand, may face increased competition as an entry barrier to new sectors.

Skill and equipment mismatches, especially in production and primary processing, also limit worker mobility. High-value and growing commodities like vegetables often depend on irrigation systems, storage facilities, and market access distinct from those in the declining grain sector.[156,157,158,159] Jobs in alternative proteins may demand technical expertise (e.g., product formulation) or higher education in fields such as food science, limiting access for workers in animal processing roles (e.g., slaughterhouse workers) whose specialised skills will diminish in relevance.

Given the localised nature of anticipated displacement, support must be tailored both geographically and individually—and must take into account opportunities beyond the food system. Workers face different job market dynamics based on location, gender, and migration status, and will need different forms of support—including help finding employment outside of the food sector.

Some workers will be able to transition directly from declining commodities to new food system jobs—if employers and governments provide funding and support. With new equipment, grain producers may be better able than livestock farmers to transition to fruit and vegetable production given greater similarities in terrain and land use.[160] Secondary and tertiary processors have already proven successful at converting from dairy or meat to plant-based alternatives. For example, Danone invested €43 million to transform its Villecomtal-sur-Arros dairy plant in France to an oat beverage facility,[161] reskilling 138 workers through peer-to-peer training with staff at another factory.[162,163,164]

Finally, as workforces grow in sectors such as fruits and vegetables, urgent action is needed improve poor working conditions—or else a larger pool of workers will simply be exposed to the same labour rights violations that already are too common.

Case studies

This section analyses how shifting demand affects three distinct value chains—US beef, UK dairy, and Spanish tomatoes—to illustrate the full spectrum of employment impacts across different commodities and regions. By delving into specific case studies, it provides a more nuanced understanding of how demand shifts influence workers. Each case study focuses on the production and processing stages, where job disruptions are expected to be most significant.

Case Study: US beef production and processing

Market analysis

The US is the largest producer of beef in the world, generating 12.3 million tonnes of beef annually, valued at approximately $108 billion (as of 2024). US beef accounted for 20% of global production and 21% of the world's beef consumption in 2020.[165]

The US beef industry is highly concentrated. Four major players control about 85% of the slaughterhouse and packaging market.[166] There are concerns about these big four buyers' anticompetitive behaviour towards farmers and ranchers, and large retailers and food companies have challenged these companies on their alleged price fixing practices.[167,168] This high level of concentration means that influencing working conditions and transitioning the industry towards net zero emissions can be challenging and will require buy-in from these large players.

In 2024, US beef cattle production employed over 1.3 million workers,[169] with approximately 560,000 workers in cattle, poultry, and other meat slaughtering and processing.[170] Beef processing jobs are geographically concentrated and industrially intense[171,172] and are characterised by poor working conditions, significant occupational risks, and heightened vulnerability to automation and regulatory changes.[173,174]

Job conditions today

Workers in beef production and processing are exposed to health risks, intimidation, and labour rights violations. Many workers are migrants and members of marginalised groups (at least 83,000 workers in US animal slaughtering and processing are undocumented), which compounds their vulnerability to exploitation and job displacement.[175,176,177]

Many US beef processing workers earn low wages and are subject to unfair pay practices, as well as high health and safety risks. Documented workers are typically paid an hourly wage, but the industry relies heavily on non-standard contracts for part-time, temporary, and in some cases piece-rate roles in lower-wage positions.[178,179] Most workers do not have access to social protections and face a wide range of physical and psychological hazards, including repetitive strain injuries and unsafe or traumatic working conditions.[180] The meat industry is known to have some of the highest rates of occupational injury and illness in the United States, with fatalities reported every year.[181] The COVID-19 pandemic further intensified these risks and saw over 59,000 infections and 269 deaths among workers at the five largest meatpacking companies between 2020 and 2021.[182]

Subcontracting and use of third-party service providers in the industry increase risks for vulnerable workers. Between 2022 and 2023, the US Department of Labour found 102 children in eight US states employed in hazardous roles by third-party sanitation contractors for major beef processors. Their tasks included cleaning equipment such as skull splitters, brisket saws, and bone cutters in meatpacking plants.[183]

Collective bargaining power in the beef processing industry is minimal; workers have little agency to improve working conditions. Just 18% of meatpacking workers were unionised as of 2020.[184] In 2022, meanwhile, the four largest meat processing companies exchanged confidential wage information and suppressed worker compensation. These practices affected tens of thousands of employees across more than 140 facilities nationwide and led to over $200 million in settlements.[185]

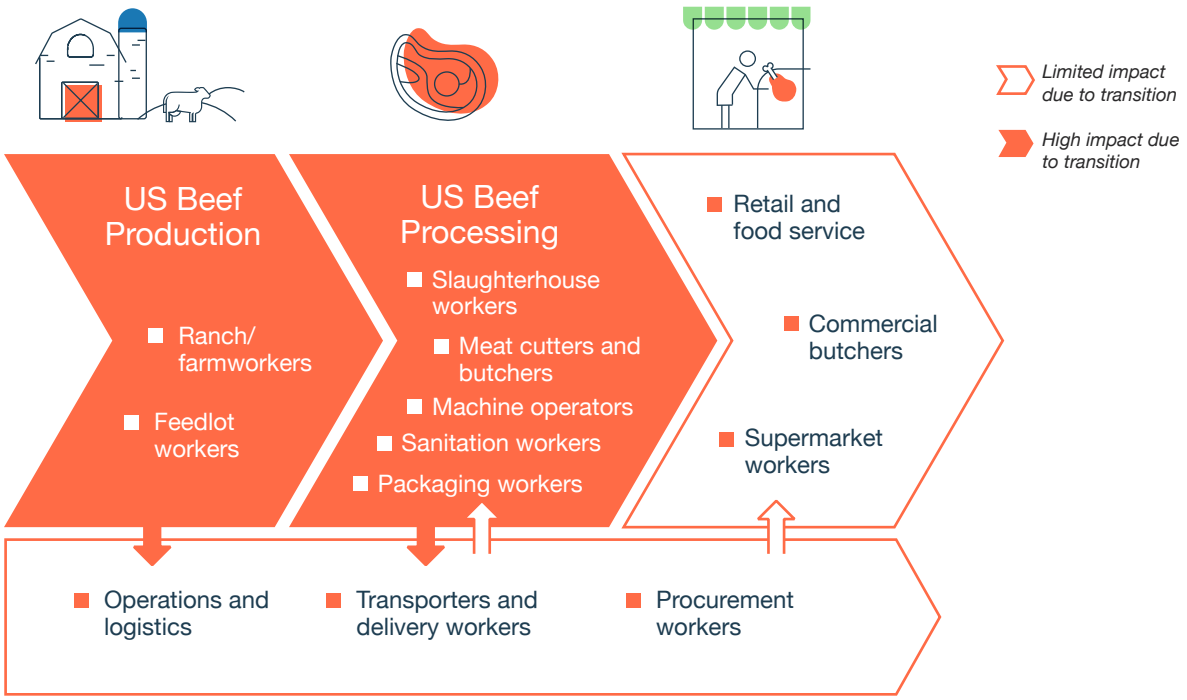
Job changes forecast in the US beef value chain

The commodity-specific nature of beef production and processing jobs makes them vulnerable to significant reduction as demand shifts. Under the "ambitious medium-term" scenario, production and processing jobs in US beef are expected to decrease by 15–20%; if the transition is not managed well, that figure is predicted to be much higher under the "long-term net zero" scenario.[186] Ranch and feedlot roles—already heavily reliant on migrant labour—are at particular risk of displacement, as workers are often employed under temporary or at-will arrangements, with minimal legal protections.[187] In the processing stages, slaughterhouse workers, meat cutters, machine operators, sanitation workers (often employed through third parties), and packaging workers will be most affected (see Figure 7).

The impacts of a reduction in the beef workforce would be felt acutely in a handful of regions. Roughly 42% of the country's meatpackers are employed in just five US states: Nebraska, Iowa, Texas, Kansas, and Illinois.[188] Ranchers and cattle farmers, mostly located in the Great Plains and typically operating on tight margins, will also be significantly affected as long-term declining demand and shrinking herd sizes make production less financially viable, particularly for smaller calf-cow operations.[189]

Climate change is likely to make future working conditions more harmful, as rising temperatures and more frequent extreme weather events may strain cattle production and processing operations. Workers in physically demanding roles will face greater risks of heat exposure and repetitive strain, while financial pressure up and down the supply chain will likely weaken already insufficient labour protections.[190,191]

Figure 7: High-level impact on US beef jobs by type (non-exhaustive)



***Ranch workers** are responsible for feeding, watering, and monitoring cattle health, as well as managing calf birthing, branding, and herd movements. They also prepare animals for transport to feedlots or slaughter facilities.*

***Feedlot workers** oversee the nutrition and welfare of large cattle herds, paying close attention to weight gain, signs of stress, and hygiene.*

***Slaughterhouse workers** carry out the initial stages of processing, including stunning, bleeding, skinning, and evisceration.*

***Meat cutters and butchers** debone, trim, and portion beef in accordance with USDA specifications, operating knives, saws, and other specialized cutting equipment.*

***Machine operators** manage grinders, conveyors, and packaging lines.*

***Sanitation workers**—usually working overnight—are responsible for cleaning and disinfecting all equipment and surfaces.*

***Packaging workers** weigh and pack meat products for wholesale or retail, often in refrigerated environments.*

Case Study: UK dairy production and processing

Market analysis

As of 2020, the UK was the 13th largest milk producer in world (at 15 billion litres); dairy production accounted for 16% of the country's annual agricultural output.[192,193]

Small players make up the majority of the UK dairy market (in contrast to the US[194]). There are an estimated 7,000 commercial dairy producers in the UK. Many farmers are directly involved in every aspect of production, from animal care and feeding to milking and first-stage handling—making small-scale producers central to milk quality, welfare standards, environmental impact, labour conditions, and supply stability.[195,196,197] The UK dairy sector employs approximately 70,000 people—roughly 20,000 in processing and 50,000 across farms and supporting industries.[198]

Over the last two decades, production has shifted towards larger, more intensive farms at the expense of smallholder dairy producers. From 2008–2017, the number of holdings in the UK dairy industry fell,[199] while dairy production rose by ~11% and average farm size grew by ~30%.[200] Longstanding power imbalances with retailers mean that small dairy farmers often operate at a loss, as retailers pay below breakeven rates. As demand for dairy declines, this imbalance is expected to increase.

Job conditions today

Nearly 10% of surveyed dairy farmers expect to stop producing milk by 2025 due to regulatory costs, labour shortages, and rising staff expenses.[201] Some are shifting to plant-based products like oat milk.[202] Organisations like Refarm'd are actively helping farmers transitions their land, infrastructure, and skills towards more climate-aligned production.[203] High debt levels, however, make such changes difficult—UK dairy farmers carry an average debt of £458,800, compared to £248,000 for other farmers; 62% owed at least £150,000 in 2021 due to high equipment and operating costs.[204,205]

For farmworkers, jobs remain labour-intensive, physically demanding, and relatively low-paid. At the same time, the industry faces labour shortages. A recent survey of Arla UK dairy farmers found that 56% had greater difficulty hiring staff compared to 2019, while 86% reported that applicants lacked required skills.[206] Wages rose by 27% from 2019 to 2024, yet labour shortages persist: 8.5% of farms have reduced production and 10.6% have downsized their herds.[207] Many dairy farmworkers report 50–55-hour work weeks—significantly above the 48-hour legal limit;[208] one in four dairy farmworkers is at high risk of depression due to excessive hours, low autonomy, and job insecurity.[209]

Automation is reshaping the UK dairy sector. Robotic milking—used on roughly 10% of UK dairy farms in 2023[210]—reduces physical strain and improves flexibility for farmers, but reduces demand for manual labour. As milking represents over 30% of farm labour, robotic systems provide labour savings of around 20%.[211] As automation expands, the viability of traditional on-farm roles faces growing pressure. Larger dairy companies with more capital are able to adopt automation and digitisation more quickly, boosting productivity and profitability but reducing the number of jobs in the industry.[212,213]

While automation creates some higher-skilled positions, overall workforce needs for large-scale dairy production are expected to decline—especially for lower-paid, contract roles—affecting job quality and stability across the sector.[214,215]

Jobs changes forecast in the UK dairy value chain

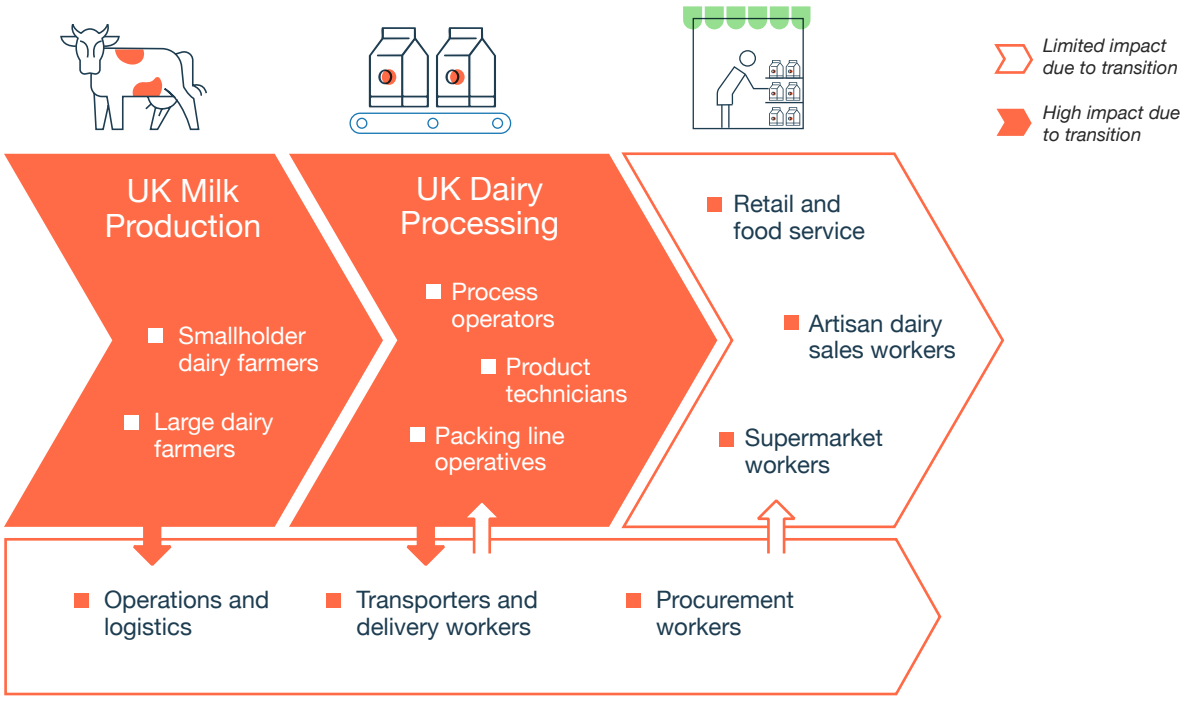
Under the "ambitious medium-term" scenario, farmworker jobs in production and processing are expected to decrease by 5–10%.[216] Dairy farmworkers and livestock technicians will be the most affected on farms, while process operators, product technicians, and packing line operatives will be impacted in processing. Job displacement will likely hit hardest in West England—particularly in the dairy centres of Devon, Cheshire, and Lancashire—although some of this might be offset by the existing labour shortages.[217]

Across all scenarios, smallholder farmers—already limited in their bargaining power—face further closures due to unprofitability.[218] Growing consolidation reduces pricing transparency and weakens smaller producers' ability to negotiate.[219] Addressing these structural imbalances is vital for a just transition. Without targeted policies and support, smallholders will remain disadvantaged in pricing and ill equipped to adapt to falling demand, increased automation, and shifting employment models.

Climate change is also expected to worsen conditions for dairy farmworkers. Higher temperatures expose workers to more hazardous environments, reduce milk yields, and increase heat stress.[220] Climate change will also limit water access and reduce feed quality in some areas.[221,222] These impacts can raise production costs and require greater investment to maintain yields, further squeezing profit margins and worsening labour conditions, particularly for smallholder farmers.[223]

Dairy companies can help by reskilling workers for growth sectors like plant-based dairy alternatives. For example, in 2020, Meadow Foods, a leading UK dairy processor, invested £4 million to convert parts of its facilities to plant-based production and upskilled staff accordingly.[224]

Figure 8: High-level impact on UK dairy jobs by type (non-exhaustive)



***Dairy farmworkers** are responsible for core animal husbandry tasks including milking cows—either manually or through automated parlour systems—feeding, bedding, and maintaining hygiene in milking areas. They also play a key role in monitoring herd health and assisting with calving in line with regulatory groups like the National Farmers' Union (NFU) and Red Tractor Assurance*

***Livestock technicians** monitor animal fertility and prevent disease outbreaks*

Milk process operators** handle the initial transformation of raw milk through pasteurisation, separation, and **homogenisation.

***For milk-based products, product technicians and cheesemakers** manage cultures, curd formation, and ageing processes to produce dairy products including butter, cream, yoghurt and cheese.*

***Packing line operatives** seal, label, and box dairy products for distribution to retail or export markets.*

Case Study: Spain tomato production and processing

Market analysis

Tomato production accounts for 23% of Spain's horticultural value and 14% of its cultivated land.[225] In 2021, Spain produced 4.8 million tonnes of tomatoes, ranking as the world's eighth largest producer.[226,227] Most production is concentrated in Extremadura (64%), Andalusia (including the cities of Almería and Huelva; 26%), and the Ebro River Valley (8%), though this may shift in the future due to water stress and climate change.[228]

The industry is moderately concentrated, with a mix of large cooperatives, private firms, and multinational corporations. While no single entity dominates, major players hold significant regional or segment-specific shares.[229,230]

Job conditions today

Jobs in Spain's tomato industry fall into five key areas: field labour, greenhouse work, processing and packaging, logistics and distribution, and food retail and support services.

Field and greenhouse work is seasonal, highly labour intensive, and heavily reliant on migrant and temporary workers. Well-documented issues for tomato workers include unstable employment, wage theft, exploitative hiring practices, unsafe working conditions (e.g., exposure to harmful pesticides), precarious living conditions (many workers live in shantytowns near farms and at times do not have access to running water[231]), and lack of access to grievance mechanisms.[232] Due to language barriers and migration status, undocumented workers are especially vulnerable to exploitation; 30% of workers in Almería and 25% of workers in Huelva are undocumented.[233]

Job changes forecast in the Spanish tomato value chain

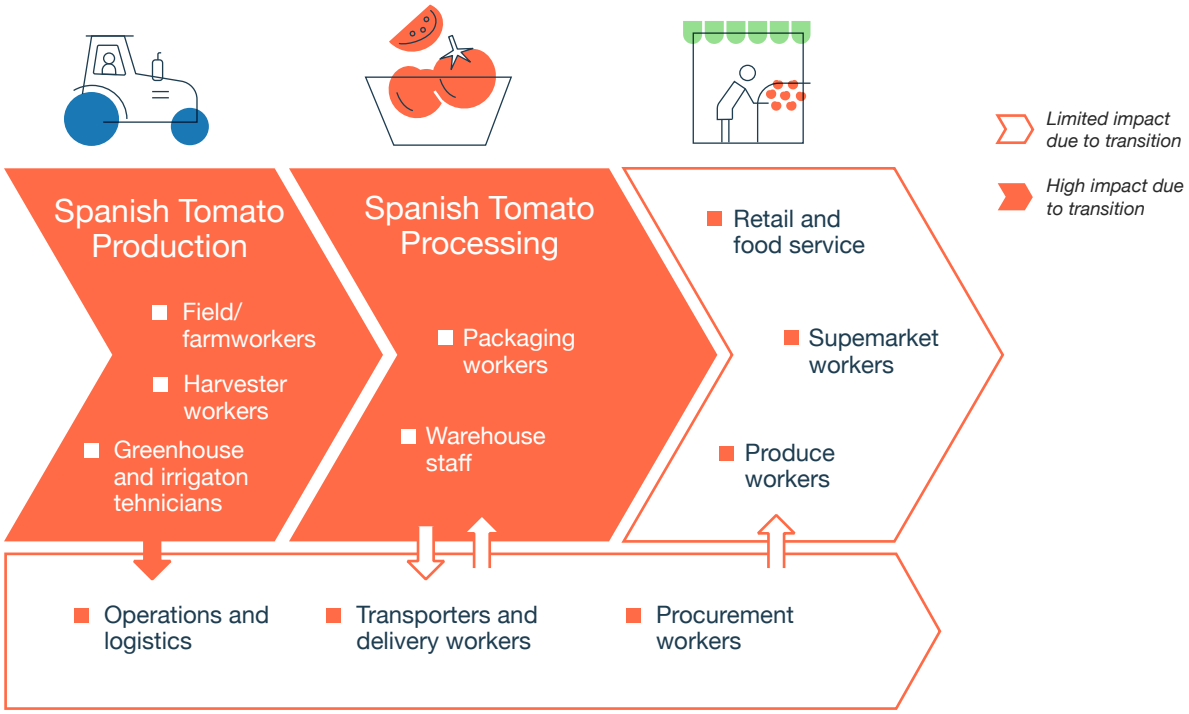
As demand for tomatoes grows, new jobs will emerge within the tomato supply chain, potentially increasing the number of workers in challenging conditions. In the "ambitious medium-term" scenario, tomato production jobs in Spain are expected to increase by 10–30%[234]—particularly in field labour, harvesting, greenhouse work, and packaging (see Figure 9).

In all scenarios, working conditions are expected to worsen due to climate change. Short-term risks include increased heat stress, as temperatures exceeding 50°C become more frequent.[235] Long-term impacts may alter the seasonality and location of tomato farming, spurring a shift to controlled-environment systems or high-tech greenhouses,[236,237] (and requiring worker relocation or reskilling), as well as resulting in increased unemployment and displacement of migrant populations.

The adoption of sustainable agricultural practices—such as soil health management, water retention, and reduced chemical inputs—could improve resilience and working conditions in the sector.[238] Many Andalusian tomato farmers are already diversifying crops to reduce water dependence and monoculture risk.[239] These practices can also reduce pesticide and fertilizer use, diminishing worker exposure to harmful chemicals.[240]

Technology may help further improve working conditions. For example, Helios AI forecasts climate and labour risks for more than 50 crops (including tomatoes) across 90% of global production districts. With up to three-week forecasts,[241] growers, greenhouse operators, and processing facilities can anticipate heat events and better manage harvest and packing schedules.[242] However, these tools must be deployed in inclusive ways to ensure that benefits reach small producers and vulnerable workers, not just large agribusinesses.

Figure 9: High-level impact on jobs in the tomato industry in Spain by type (non-exhaustive)



Field workers and farm labourers *perform tasks such as planting, pruning, staking, watering, and applying inputs like fertilizer and pesticide.*

Harvesters*, working manually or with mechanized tools, are responsible for picking, sorting, and packing tomatoes.*

34% of tomato production in Spain is in protected environments including greenhouses*, greenhouse technicians manage temperature, humidity, and irrigation levels. Irrigation technicians oversee water delivery systems to maximize crop health and yield.*

Packaging workers *are responsible for washing, grading, sorting, and preparing tomatoes for retail.*

Warehouse staff *manage the storage and movement of goods.*

IV. Call to action

for workers, businesses, investors, governments, media, and civil society: what we can do now to achieve a just transition

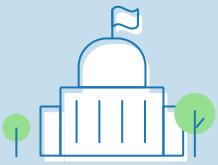
BUSINESSES

Why Act

Businesses including producers, manufacturers, and retailers can protect their brand, reduce legal and supply chain risks, and enhance long-term workforce and supply chain stability by embedding fair labour practices and investing in worker reskilling. Taking proactive steps to ensure a just transition aligns companies' net zero targets with existing global labour standards and positions them to meet growing regulatory and consumer expectations.

Priority Actions

- Strengthen protection of own employees and supply chain workers through, e.g., prohibiting recruitment fees, strengthening employment contracts, and adopting climate adaptation and heat protection policies.
- Incorporate sustainability / social goals into overall business strategy; establish just transition plans that are aligned with overall corporate goals
- Strengthen supply chain due diligence and transparency and participate in industry-led initiatives and grievance mechanisms
- Support workforce development—as well as workers' ability to access transition opportunities through capacity building and co-investment—by supporting worker agency, including workers in transition planning and implementation, investing in reskilling and support programmes, and expanding social protection programmes.



GOVERNMENTS

Why Act

Governments have a responsibility to protect food system workers and enable them to exercise their rights by strengthening existing labour regulations and protections. Governments are responsible for holding businesses accountable for meeting net zero goals in ways that align with just transition principles. Regulating social and environmental practices creates a level playing field for the private sector while ensuring economic and social stability.
Governments also need worker and voter support to meet climate ambitions under the Paris Agreement. Elevating worker voices in transition planning and investing in capacity building and infrastructure are critical to obtaining this support.

Priority Actions

- Strengthen labour protections through regulatory reform
- Enhance and invest in increased worker capacity building and access to remedy, such as national or state-level grievance mechanisms and worker outreach
- Promote fairer food systems through, for example, supporting alternative ownership models, public procurement, and use of anti-trust laws
- Plan for and invest in a transition that includes and delivers value for workers through engaging with the private sector, including workers in just transition strategies, and investing in reskilling and support programmes as well as expanded social protection programmes

INVESTORS

Why Act

Investors can manage long-term social and climate risks, safeguard portfolio value, and meet growing regulator and stakeholder demands by supporting a just transition. Embedding labour rights within net zero strategies will build long-term value across investment portfolios and help create more sustainable and resilient supply chains. Investor engagement with workers and CSOs—directly or through investees—can improve operational insights, surface early warning signs of human rights abuses or supply chain disruptions, and support a more stable, productive workforce.

Priority Actions

- Align investment mandates with just transition goals, using shareholder resolutions and enhanced Environmental, Social and Governance (ESG) due diligence to influence corporate behaviour.
- Leverage investor influence by requiring worker protection as part of funding conditions, engaging in stewardship initiatives, and providing favourable terms to companies with strong practices.
- Strengthen corporate accountability by encouraging and requiring transparency around e.g., labour risks, remediation and just transition plans.

CIVIL SOCIETY

Why Act

Why Act: Civil society organisations (CSOs) and NGOs have long worked to advance labour rights, sustainability, and corporate accountability. Driven by their mission and close ties to affected communities, they are key actors in pushing for transition plans that centre justice and inclusion. Civil society actors are well positioned to surface frontline challenges, amplify underrepresented voices, and raise potential solutions in solidarity with worker groups—as well as leverage their access to brands, retailers, and government negotiation tables. CSOs across Europe and the US already do much of this work and often require additional funding to reach more stakeholders.

Priority Actions

- Raise awareness of what a just transition looks like in practice through advancing transition narratives that centre just practices.
- Promote and facilitate collaboration between movements and different stakeholders
- Build inclusion and community participation uplifting underrepresented voices, ensuring that they have a role in transition planning and implementation.
- Provide services and promote structural reform such as legal aid, psychosocial support, and safe reporting tools.

MEDIA

Why Act

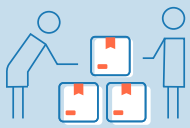
Media plays a critical role in shaping public discourse, educating consumers, and influencing both corporate and policy agendas. Coverage of our changing food system delves into climate change, labour rights, immigration, and the just transition to net zero emissions, among many other topics that directly impact consumers of media. Media organisations can amplify food system workers' voices in coverage of climate change, and hold businesses and governments accountable for their roles in food system transitions.

Priority Actions

- Shape public support for a just transition by presenting developments, policy measures, and examples of effective implementation
- Amplify workers' voices in just transition narratives
- Investigate labour rights abuses across food supply chains
- Track progress and sustain public pressure

Why Act

Food workers and their organisations are uniquely positioned to shape a just transition. Worker organisations (and workers more generally) have direct knowledge of current working conditions in the food system, as well as a strong motivation to ensure that the transition to net zero both increases workers' access to opportunities and mitigates and challenges they face.



WORKERS

Priority Actions

- Embed worker participation in climate and labour policy
- Build worker capacity and climate literacy
- Secure a just transition through bargaining and global advocacy

Cross-Cutting Guidance for Stakeholders

All stakeholders should focus on mitigation and adaption efforts in tandem to ensure the greatest impact. Applying a place-based[1] and inclusive lens is key to ensuring that stakeholder efforts are meeting the needs of the most vulnerable. Specifically, this means:

- Concentrate support—such as funding, reskilling, and labour protections—in regions facing the greatest risk of disruption, such as areas dependent on carbon-intensive agriculture and industrial meat processing.
- Integrate gender equality and social inclusion (GESI) into their efforts from the start by proactively including women, migrants, and other marginalised groups in policy design, implementation, and monitoring. This requires access to disaggregated data, targeted outreach, and inclusive governance mechanisms to ensure equitable outcomes.

1. Place-based refers to policies or approaches that are intentionally targeted at specific geographic areas and tailored to reflect local conditions and opportunities

Stakeholder action today

Stakeholders—including government, businesses, investors, workers, producers, NGOs, and media—are already taking steps towards a just transition by advancing worker inclusion, agency, and accountability. Worker organisations, NGOs, and civil society organisations are undertaking the lion's share of efforts on worker inclusion. As Figure 10 below indicates, greater stakeholder effort has gone into increasing accountability than into advancing worker agency and inclusion, largely due to the leadership of NGOs and civil society organisations. Some governments have introduced new regulations or revised existing ones (such as the Modern Slavery Act), and businesses are increasingly committing to fair labour practices. However, enforcement is inconsistent across industries and regions, and further action is needed to ensure sufficient uptake and implementation of commitments and regulations.

Given the complexities of the food system, multi-stakeholder collaboration and collective action will be critical to making progress towards a just transition. Whether enabling, facilitating, or steering change, all stakeholders have a crucial role to play.

Figure 10: Actions of stakeholder groups to improve accountability, agency, and inclusion

Stakeholder segment	Stakeholder sub-segment	Accountability	Agency and inclusion
Workers and producers	Worker – led social responsibility groups		
	Worker unions		
Governments	National / regional govt.		Some action started by leading governments such as Denmark
	Regulators		
Businesses	Retailers and manufacturers		Some action started but limited actors so far
	Industry association and member groups		
Investors	Investors		Some action started but limited actors so far
	Investor networks		
Media	Agrifood system and labour media		Some action started but limited actors so far
NGOs, civil society, foundations, and funders	Just transition and climate focused		
	Workers' rights focused		
	Circular economy focused		
	Foundations and funders		
	Research institutions		

Priority actions for stakeholders

This section explores in detail what practices each stakeholder can adopt to facilitate a just transition.

BUSINESSES

1. Strengthen protection of employees in own operations and in supply chains

- **Promote fair recruitment practices:** Ban worker-paid recruitment fees and audit recruitment agencies to minimise forced labour risks. Ensure that suppliers adopt stringent procedures to implement responsible recruitment practices and prohibit recruitment fees. Ensure that all workers—especially migrant and seasonal workers—receive clear employment contracts in a language they understand. Avoid exploitative, short-term work models by committing to stable, legally compliant employment practices.
- **Provide fair pay and benefits:** Ensure provision of fair or living wages to workers across operations and supply chains.[243] Ensure that dormitories meet industry standards, healthcare is accessible, and wage protections are enforced, especially for food production and processing workers. Require suppliers to implement these principles further down the supply chain where risks are typically the greatest. Focus on enabling suppliers to uphold fair labour practices through responsible purchasing practices, long-term commitments, and fair pricing.
- **Develop climate adaptation policies and plans:** Protect vulnerable workers from extreme weather by, for example, adjusting shifts, providing heat protection, and providing social protections, including parametric insurance (e.g., for natural disasters). Establish an extreme weather / heat protection policy for suppliers and cascade this down the supply chain.
- **Leverage the role of regulation:** Lobby governments for tighter regulation on worker's rights and supply chain due diligence in order to create a level playing field and ensure uptake across the industry.

2. Incorporate sustainability / social goals into overall business strategy

- **Develop just transition plans that are aligned with overall sustainability and corporate strategy:** Establish and implement just transition plans that are aligned with global goals and the broader sustainability and corporate strategy, and that are developed in genuine consultation with suppliers and workers.
- **Business model transformation:** Redesign business models to prioritise long-term sustainability, equity, and resilience. Alternative models like worker cooperatives, employee-owned enterprises, and

Transforming business models

OrganicLea, a food-growing cooperative in northeast London, transitioned to a worker-owned model in 2001. It implemented equal pay across roles and provides structured training and paid employment opportunities for local residents, helping to improve mental health, income stability, and job quality in a sector typically characterised by low-wage, seasonal work.

Source: Tribune (2025) Glasshouse Communism

Why act?

Disconnects between a company's overall responsible sourcing commitments and its day-to-day sourcing practices often pose risks to workers. In 2023, UK retailers were linked to labour abuses in Spanish produce supply chains despite holding certifications and issuing public human rights pledges. Pricing pressure and erratic ordering contributed to these abuses, underscoring the importance of cross-functional accountability and close collaboration between, for example, sourcing and sustainability / human rights departments in limiting exposure to labour rights violations.

Source: Business and Human Rights Resource Centre (2023), Produce of Exploitation: UK supermarkets and migrant labour in southern Spain - Business & Human Rights Resource Centre

community-supported food systems promote shared governance, inclusive growth, and sustainable value creation.[244]

- **Evaluate the impact of purchasing practices on decarbonisation and worker-led transition efforts.** Conduct regular internal assessments to understand whether procurement practices are aligned with, and do not hinder or contradict, decarbonisation and worker protection efforts. This requires breaking down internal silos and fostering coherence across teams working on social and environmental impact and sourcing / procurement. Without long-term sourcing commitments, fair prices, and shared responsibilities and rewards, suppliers cannot be held responsible for their role in the just transition. Purchasing practices are a critical tool to support implementation of decarbonisation and labour strategies.

3. Strengthen supply chain transparency and accountability

- **Align with labour standards and conduct regular supplier monitoring:** Require and enable suppliers to meet labour standards aligned with company codes of conduct. Adopt industry-wide standards where possible to simplify requirements for suppliers. Ensure that suppliers are required to uphold freedom of association and collective bargaining across geographies. Conduct regular (unannounced) social audits to verify compliance at Tier 1 and lower levels (i.e., farm level); include interviews and worker surveys to gain additional information about workers' experiences. Use additional tools such as Human Rights Impact Assessments (HRIAs)[viii] to obtain information about key human rights risks.
- **Establish responsible sourcing / ethical procurement practices:** Volatile orders and rushed delivery schedules often lead to excessive and irregular working hours, especially for perishable goods. Companies can reduce risk by improving demand forecasting, stabilising order volumes, and signing long-term contracts with suppliers. Some companies offer favourable contracting terms / enabling finance to suppliers with strong social performance to incentivise action and support investments in social or environmental improvement.
- **Prohibit sub-contracting:** Limit or prohibit the use of unauthorised subcontracting, which weakens oversight of labour standards. Require suppliers to request permission for subcontracting and consider auditing the facility before orders are placed.
- **Increase transparency:** Disclose supply chain due diligence and just transition efforts, such as publishing supplier lists down to the farm or factory level to enable public accountability. Report on efforts to enable a just transition and protect worker's rights. Promote industry-wide adoption of shared transparency tools and open data systems to improve due diligence and strengthen accountability in high-risk supply chains.
- **Join grievance mechanisms:** Establish confidential grievance mechanisms that workers can access securely—focusing on third-party, industry-wide or regional mechanisms or hotlines that operate independently of any specific buyer.
- **Engage in sector-wide collaboration:** Join collective efforts to address structural labour risks such as wage suppression and unsafe conditions. Participate in industry-wide platforms to align labour standards, share due diligence tools, and build supplier capacity, specifically with respect to preparing for, and implementing, the just transition.

viii. HRIAs are typically public-facing reports that evaluate key human rights issues in a specific supply chain that can help reveal hidden abuses and drive industry action

Becoming more transparent

Open Supply Hub is an open, centralised platform that facilitates supply chain transparency by allowing companies to publish standardised, facility-level supplier data. Food retailer Asda, for example, has mapped over 2,900 suppliers through the platform, enhancing internal data integrity, enabling alignment with other buyers sourcing from the same facilities, and creating opportunities for earlier, more informed engagement with civil society on labour risks.

Sources: Open Supply Hub (accessed June 2025) Open Supply Hub - Sectors

Do your due diligence in public

German retailer Lidl conducts various HRIAs every year, focusing on different crops and regions, to gain insight into salient human rights risks in its supply chain. Jornaleras de Huelva en Lucha, an Andalusian women's agricultural and industrial worker organization, singled out one of Lidl's HRIAs as a rare and meaningful act of corporate transparency. In the US, in 2023, retailer Kroger published a human rights impact assessment on mixed greens in California, identifying prevalent issues in the industry and highlighting opportunities for collective action by retailers and buyers.

Sources: Lidl Spanish Berry HRIA; Kroger, (2023), Human Rights Impact Assessment Mixed Greens in California

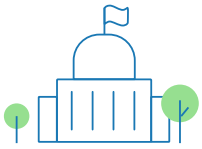
4. Support workforce development and ability to access transition opportunities through capacity building and co-investment

- **Invest in worker awareness and capacity-building:** Invest in multilingual, accessible education to help workers—especially migrant and seasonal labourers—understand their rights; for example, through meaningful engagement and partnerships with unions, worker organisations, or CSOs.
- **Conduct place-based retraining, financing, and due diligence:** Co-invest with governments and local partners in place-based retraining and upskilling programmes and financing for workers and suppliers in high-risk agricultural and processing roles, aiding their transition into stable employment. Expand social protection programmes to cover vulnerable workers and those impacted by the just transition. For example, plant-based brand Eat Just Inc. repurposed a protein processing plant in Minnesota in 2019 to produce its plant-based egg, and invested millions to retrain and double its workforce.[245]
- **Support worker agency and include workers in transition planning and implementation, directly or through worker-led organisations:** Maintain an ongoing, open dialogue with unions and worker-led organisations to prioritise worker voices in decision making and planning for a just transition; proactively support collective bargaining and freedom of association.

Creating safe, accessible grievance mechanisms

Tesco, in partnership with the International Union of Food, facilitated women's access to reporting mechanisms in its food supply chains, identified opportunities to reduce women's vulnerability in the workplace, and completed regular reviews of its grievance system to enhance transparency and accountability.

Source: ILO (2022) Memorandum of understanding concluded between Tesco and IUF | CBSD



GOVERNMENTS

1. Strengthen labour protections through regulatory reform

- **Ban exploitative seasonal contracts and promote stable employment.** Regulate subcontracting and labour intermediaries, which employers often use to outsource labour and avoid responsibility for poor working conditions in fruit and vegetable supply chains. Stricter regulation and monitoring of these contractual agreements can help address the lack of visibility and transparency in the sector.
- **Mandate human rights and environmental due diligence (HREDD) for the private sector by codifying these requirements in national law.** Legislation should include enforcement mechanisms, liability provisions, clear protections for seasonal and migrant workers, and mandatory public reporting and transparency.
- **Strengthen labour inspections and public oversight to prevent rights violations in the food sector.** This includes expanding and professionalising inspection teams with more funding, training, and sector-specific expertise, and using vetted, third-party auditors to minimise concerns around bribery and corruption.

2. Enhance and invest in increased worker capacity and access to remedy

- **Support safe, accessible grievance mechanisms that allow food system workers to report abuses or unsafe working conditions**

Recent regulatory reform

Spain's 2022 introduction of "intermittent permanent worker" contracts, developed with unions and business, replaces exploitative seasonal contracts and improves job security. Germany's 2021 Housing Strengthening Act in the meat-producing state of North Rhine-Westphalia sets minimum standards for worker housing and enables inspection by local authorities. In 2020, Germany banned subcontracting in meat processing, ending a common practice that enabled hiring migrant workers under less favourable conditions.

Sources: Clifford Chance (2021) The New Labour Reform in Spain; Lenz and Johlen, Landtag NRW verabschiedet Wohnraumstärkungsgesetz; ETUI Change a long time coming for subcontracted slaughterhouse workers

Turning principles into law

The EU's Corporate Sustainability Due Diligence Directive (CSDDD) is a major effort to translate voluntary sustainability principles into national law. It recognises the food and beverage sector's impact on human rights and climate across global value chains, placing due diligence obligations

without fear of retaliation. Industry-wide / regional implementation is critical given the challenges in supply chain visibility, and government-led grievance mechanisms make it easier for farmworkers to report issues regardless of who the buyer is.

- **Invest in worker outreach and capacity building to raise worker awareness of their rights and strengthen worker organisations.** Many workers—especially seasonal and migrant workers—are unaware of their protections or how to access them. Governments can fund outreach in food-sector workplaces and support worker organisations in building alliances, engaging in policy dialogue, and providing education on sustainability and a just transition.
- **Promote dialogue with worker-led organisatoins to support the inclusion of workers' voices.** Establish partnerships with unions and worker-led organisations; organise social dialogue and roundtables with relevant stakeholders, e.g., businesses, unions, NGOs, etc., to include and centre worker voices in decision-making.

3. Build fairer food systems through market levers and ownership reform

- **Use anti-trust laws and trade policy to address corporate concentration in the food system, enabling better regulation of climate-damaging practices and protection of labour rights.** Aligning labour and environmental goals in trade policy prevents fragmented reforms that erode public trust and deepen political division. An example of this is the UK Groceries Code Adjudicator, which is responsible for regulating the relationships between large UK retailers and their suppliers.[246]
- **Support alternative ownership models—such as worker cooperatives, employee ownership trusts, and producer-led enterprises**—that can play a transformative role by rebalancing power in food systems and making it easier for individual workers to influence the transition.[247]
- **Use public procurement to promote decent work and sustainability standards.** Embed labour and environmental criteria into food purchasing for schools, hospitals, and public canteens to reward suppliers with fair labour practices and sustainable production methods.

4. Plan for and invest in a transition that includes and delivers value for workers

- **Ensure that businesses take responsibility in adaptation efforts.** Conduct regular monitoring of, and dialogue with, the private sector to review and track business-led adaptation efforts. Actively invite businesses to play a leading role in any adaptation programme through roundtables, dialogue, and incentive programmes.
- **Include workers—especially from marginalised groups—in national and local just transition strategies, as well as labour, agricultural, and climate policies.** Governments can mandate worker representation on advisory boards and in policy forums, ensuring that trusted institutions like unions are actively involved.[248] National strategies can align with global frameworks such as the ILO Guidelines

on agriculture, processing, and distribution. Affected companies will include large multinationals in food retail, manufacturing, and agri-processing. While the 2025 'Omnibus Simplification Package' has narrowed reporting requirements and limited the directive's scope, it is still a critical tool for establishing enforceable obligations that improve outcomes for workers in high-risk sectors like agri-food. In the UK, reforms to the Modern Slavery Act's reporting directive—including penalties for non-compliance—are under review and could form the basis of national HREDD legislation.

Sources: European Commission (2025), Omnibus package - European Commission; UK Parliament (2025) Modern Slavery Act 2015: Lords committee post-legislative scrutiny

Safe reporting mechanisms

The state of California offers various anonymous grievance reporting tools such as hotlines and anonymous email addresses, including www.99calor.org, which can be used by workers to report heat exposure and heat illness concerns for outdoor workers.

Source: CA/OSHA (Accessed July 2025) 99 Calor

Public procurement to promote decent work

The UK's Public Sector Food Procurement Initiative promotes sustainable food sourcing by encouraging public bodies to consider labour standards, including due diligence to align with ILO principles or improve conditions through direct engagement with suppliers. The COACH project supports this with practical tools and over 30 case studies across Europe to help governments design strategies. In France, the EGalim Law requires that at least 50% of food served in public catering meets high environmental, nutritional, and ethical standards—including a minimum of 20% organic products—and mandates the use of social criteria such as fair labour practices in tender evaluations.

Sources: UK Department for Environment, Food & Rural Affairs Government Buying Standard for food and catering services; COACH (accessed June 2025) Public Food Procurement | COACH Project; EU CAP Network (2023) COACH Collaborative Agri-food Chains: Driving Innovation in Territorial Food Systems and Improving Outcomes for Producers and Consumers; COACH (accessed June 2025) Public Food Procurement; Sustain (accessed June 2025) Enhancing public sector food procurement; Ministry of Agriculture and Food (2022) France's "EGAlim" and "Climate & Resilience" legislation Provisions applicable to institutional catering

for a just transition to promote consistency and coherence across countries. Planning should identify at-risk regions and communities, prioritising support where it is most needed. Implementation needs to reflect regional economic conditions, labour market structures, and specific climate vulnerabilities. Transition plans should include predictable funding, social protection (e.g., short-term income support), opportunities and support for future job growth (including in sectors beyond food), and cross-ministerial coordination.

- **Invest in reskilling and support programmes to prepare workers for changing demand and sustainable techniques.** Place-based training aligned with local economies helps workers transition to industries with job opportunities in their region—including beyond the food system. Incentivising business support is key—public funding for agriculture and sustainability initiatives can be tied to workforce retention and reskilling commitments. Governments can also create worker transition funds to support training for plant-based food jobs and innovation in new plant-based food products.
- **Invest in green infrastructure and local food systems to support economic diversification and secure, well-paid jobs—particularly in regions facing declines in industrial livestock production.** Public funding can strengthen local food markets through subsidies and incentives that promote sustainable agricultural practices and support alternative employment opportunities.[249]
- **Expand social protections / insurance for workers.** Ensure that workers have access to social protection and insurance programmes and are aware of their rights and opportunities. Where retraining and local job opportunities are insufficient to secure employment for all workers, expanding social protections—like unemployment benefits and relocation assistance—to workers impacted by the transition is essential.[250] Consider partnering with local municipalities to provide place-based support.

Suma Wholefoods—one of the UK's largest worker cooperatives—employs around 300 members who receive equal pay, rotate roles, and participate in collective decision-making. This democratic structure has earned the organisation multiple awards, including the Queen's Award in 2017 for Enterprise in Sustainable Development, and reflects a strong organisational culture grounded in shared ownership and social purpose.

Source: Workers Coop (accessed June 2025) Case study: Suma Wholefoods; Organic and Natural Business (2017) Suma announced as recipient of Queen's Award

Reskilling and innovating for a plant-based diet in Denmark

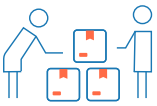
In 2023, Denmark launched a plant-based food plan backed by a €170 million fund, accessible to all food system actors—from farmers to food service. At least 50% of the fund supports the development of organic plant-based foods, positioning the initiative as part of a broader green transition. Measures include a government-funded hospitality degree programme, education on introducing more plant-based diets in primary schools, and the development of new plant-based foods.

Sources: IUF (2022) Fighting for our Future: An IUF Guide on Tacking the Climate Crisis in Intensive Livestock Production; The Guardian (2025) 'Insanely tasty green food': how the meaty Danes embraced a world-first plant-based plan; expert interview; The hotel and restaurant school (2024) Green Food Artisan Continues

Public funding for green infrastructure in the food system

In 2023, the Dutch government allocated €129 million from its National Growth Fund to the Re-Ge-NL, a programme supporting the shift to regenerative agriculture.Led by the Ministry of Agriculture, with over 50 partners, Re-Ge-NL helps farmers adopt ecosystem-restoring practices and enhance biodiversity while addressing key barriers, including knowledge gaps and economic risks, through farmer training and regional pilots. By 2030, it aims to directly support 1,000 farmers and reach over 10,000 through education and advisory networks, helping to establish regenerative agriculture as a driver of local economic diversification and a pillar of resilient, socially supported food systems.

Sources: Foodvalley NL (2023) Dutch government to invest in Regenerative Agriculture; Leren Voor Morgen (2023) Regenerative Agriculture gets boost from National Growth Fund



WORKERS

Expanding worker and union agency and engagement up and down the supply chain is vital to transforming the food system.[251]

Governments, businesses, and civil society can create enabling conditions—through legal protections, funding, and safe organising spaces—for worker organisations to have a strong voice in influencing transition policies. In turn, worker organisations can reach marginalised groups (e.g., migrant workers and women), advocate for rights and protections regardless of employment status, and build alliances with environmental groups, smallholder farmers, local communities, and women's organisations. These efforts help ensure that government policies and industry mechanisms reflect the realities of diverse food system workers and are shaped by those most affected.[252]

When supported, worker organisations effectively negotiate better working conditions with employers and buyers. For example, the Coalition of Immokalee Workers (CIW) in Florida developed the Fair Food Programme (FFP), securing binding agreements with major retailers like McDonald's and Walmart[253] to improve wages, safety, and monitoring in the tomato industry.[254] CIW empowered workers to define a code of conduct, which several retailers agreed to uphold. Violations trigger sourcing bans, enforced by a third-party monitoring body. The model's success is inspiring similar efforts in other sectors and regions.[255] Migrant Justice's Milk with Dignity programme in the US is another example of worker-driven social responsibility, using enforceable agreements between workers and buyers to guarantee fair labour conditions.[256,257]

1. Influence climate and labour policy

- Worker organisations should **participate in local and national climate and labour policymaking**, amplifying the voices of affected groups like small producers and migrant workers, and pushing for solutions that reflect these perspectives on local conditions and needs.[258]
- **Lobby for alignment between climate and labour policies** to ensure that the just transition is considered in any climate-related policymaking.

2. Build worker capacity and climate literacy

- **Raise awareness of labour rights and climate impacts, especially among migrant, seasonal, and young workers.** In-person trainings remain vital, while digital tools—such as WhatsApp, TikTok, and multilingual onboarding apps—help reach workers outside formal union structures in real time.
- **Integrate climate literacy and just transition principles into worker training and leadership development.** This ensures that workers understand climate impacts and the role of unions in shaping a sustainable future. In the Netherlands and Germany, unions offer

Workers influencing policy

In 2021, US groups including Food Chain Workers Alliance, Venceremos, and HEAL Food Alliance helped draft the Protecting America's Meatpacking Workers Act, which strengthened health and safety standards, protected whistleblowers, increased OSHA oversight, and reformed attendance policies.

Also in 2021, the Good Food Purchasing Programme (GFPP), developed by HEAL and the Food Chain Workers Alliance, promoted food procurement practices that support living wages, small-scale farmers of colour, sustainable farming practices, and supply chain transparency. Adopted by more than 30 US cities, GFPP influences over $1.1 billion in food procurement annually.Since joining the GFPP, Los Angeles Unified School District (LAUSD) has redirected approximately $12 million to local producers, increased local sourcing from 9% to 75%, and created 220 new food chain jobs.

Sources: HEAL Food Alliance (2025); Good Food Communities (accessed April 2025) Campaigns; Good Food Purchasing (2024) 2024 Year-End Newsletter - Center for Good Food Purchasing; iv) Good Food cities (accessed April 2025) FAQs – Good Food Purchasing Program

Using digital tools for worker outreach

In the US, the UFW Foundation uses WhatsApp's geolocation and multilingual messaging features to provide support to farmworkers outside of union structures, many of whom speak Indigenous languages—helping them report violations and access assistance even in remote areas.

Sources: Unbound Philanthropy (2022) UFW Foundation case study: The Human Impact of Climate Change

multilingual onboarding and fair mobility programmes to inform migrant workers of their rights. Unions in the UK use TikTok to reach younger workers with labour rights education.[259] Strong union awareness of net zero goals and their benefits for workers is critical—without it, unions may resist reforms.

3. Promote a just transition through bargaining and global advocacy

- **Integrate just transition principles into collective bargaining agreements (CBAs) at the national, sectoral, or company level.** These can include reskilling guarantees, emissions mapping, rights protections, and transition planning committees that include representation from vulnerable groups. CBAs make employer responsibilities enforceable and support joint planning and innovation. They can reflect local sectoral contexts and promote gender equality and protection from discrimination.[260] For example, the International Union of Food, Agricultural, Hotel, Restaurant, Catering, Tobacco, and Allied Workers' Associations provides tools and handbooks to help workers influence transition plans and contribute to climate solutions.
- **Advocate globally to reform food and trade governance.** Engaging institutions such as the EU, WTO, FAO, World Bank, and UN agencies is critical to challenging global trade rules that harm the climate and workers, and to promoting impact assessments that prioritise equity and sustainability.[ix]

Why act?

Building worker climate literacy and incorporating it into worker organisation actions is key; without these efforts, climate policies and labour laws risk opposing each other. For example, in 2024, agricultural unions representing EU meat and dairy sector workers lobbied to dilute six proposed climate measures that would have tightened emissions caps and land-use rules. The policies promised significant emissions reductions but also implied job losses in processing and primary production.

Sources: DeSmog (2024) Meat and Dairy Industry 'Weakening' Climate Policy in the EU: Report

INVESTORS

Investors' strategies need to reflect diverse business ownership structures—publicly traded companies answer to shareholders, while private or private equity–owned firms concentrate decision-making power. Four of the EU's top five supermarket chains are privately owned,[261] while nine of the top ten US food companies are publicly traded.[262] The strategies below offer pathways for investors to promote fair labour and just transition goals across different ownership structures.

1. Align investment mandates with just transition goals

- **Integrate labour rights and just transition criteria into investment mandates, using shareholder resolutions and ESG screening to influence corporate behaviour.** As part of due diligence pre-screening and evaluation (through questionnaires and interviews with management), focus on the company's sourcing exposure (e.g., critical commodities and sourcing geographies), responsible sourcing principles, transition plans, and consideration of workers' rights.
- **Co-finance worker transition funds** via development banks and pension funds to ensure that displaced workers in climate-vulnerable sectors receive financial support and reskilling.

ix. For more information and guidelines, refer to International Union of Food, Agricultural, Hotel, Restaurant, Catering, Tobacco and Allied Workers' Associations (IUF) (2022) Fighting for our Future: An IUF Guide on Tacking the Climate Crisis in Intensive Livestock Production

2. Use investor influence to promote workers' rights and worker inclusion

- **Make worker inclusion in governance structures a condition of funding** by requiring worker advisory boards, worker feedback in sustainability reports, and worker input in impact assessments.
- **Engage in stewardship initiatives** such as the Principles for Responsible Investment (PRI) or FAIRR to promote investor uptake of supply chain and human rights due diligence and explore joint innovative research and implementation projects. Similarly, Climate Action 100+, an investor-led alliance, brings investors together to engage companies on improving climate change governance. The organisation provides resources for proxy season stewardship and corporate performance benchmarking, based on just transition criteria.
- **Disincentivise or penalise labour rights violators**, e.g., through divestment or shareholder resolutions. Provide more favourable financing terms to companies that improve working conditions or adopt fairer purchasing practices.

3. Encourage and require transparency to increase corporate accountability

- **Encourage or request disclosure of labour risks and just transition plans.** For public companies, request transparent reporting on violations and remediation efforts in supply chains. Leverage tools such as the World Benchmarking Alliance and Climate Action 100+ just transition benchmarking[263] to track corporate performance. For privately held firms, require human rights due diligence, risk disclosure, and clear remediation steps—especially in high-risk supply chains—as conditions of investment. Disclosure should go beyond reporting on risks and include mitigation and remediation measures as well as evidence of worker involvement in oversight processes. Request that companies share or disclose just transition strategies, financing mechanisms, corporate investments made to support and enable the just transition, and other initiatives to demonstrate their commitments and actions to enable a just transition.

Investor groups advancing labour standards

Investors can support initiatives like the FAIRR Initiative, which mobilises over 400 institutional investors (managing more than $75 trillion) to push for better working conditions. FAIRR's Sustainable Proteins Engagement encourages businesses to shift to alternative proteins while ensuring fair wages and workplace safety.

Source: FAIRR, www.fairr.org, (accessed June 2025)

MEDIA

1. Shape public support for a just transition through positive examples

- **Highlight real-world instances of sustainable practices and ethical supply chains** to build public, business, and worker understanding of their benefits.

2. Amplify workers' voices in just transition narratives

- **Prioritise first-hand worker testimonials, especially from marginalised groups** like migrant, seasonal, and undocumented workers, to lend visibility to diverse experiences and ensure accurate representation.
- **Collaborate with unions and advocacy groups to share worker-led efforts** and inform workers of their rights through explainer articles, videos, and local media content.
- **Partner with worker organisations to disseminate legal guidance in accessible formats**, ensuring that workers can understand the protections available to them.

3. Investigate labour rights abuses

- **Conduct in-depth reporting** to uncover issues such as wage suppression, forced labour, unsafe conditions, and greenwashing in the food sector.

4. Track progress and sustain public pressure

- **Hold companies and government accountable by monitoring commitments and reporting on implementation.** By maintaining public pressure, media helps ensure that just transition pledges lead to real, lasting improvements for workers.[264]

Featuring ethical food producers

Since 2020, Patagonia Provisions has gained media attention for sourcing sustainably harvested Alaskan salmon and organic dried fruits and snacks from North America. Coverage in The New York Times and Forbes has showcased the company's transparency and ethical food system, demonstrating how media can help shape positive narratives around just transition efforts.

Patagonia Provisions (accessed June 2025) Sourcing Sustainable Wild Salmon; New York Times (2020) More Shelf-Stable Foods from Patagonia; Forbes (2024) Why Patagonia Is Getting into the Beer Business; New York Times (2020) More Shelf-Stable Foods from Patagonia

Exposing exploitation in Spain's strawberry industry

The Guardian's 2019 investigation into Spain's strawberry industry uncovered exploitation of migrant farmworkers, particularly women, who faced wage theft, unsafe conditions, and employer retaliation. The exposé led to increased scrutiny of European supermarket sourcing practices and pressure on businesses to strengthen labour protections.

Source: The Guardian (2019) Fresh abuse claims from women picking strawberries in Spain for UK market

Holding industry accountable

A New York Times investigation found that the National Restaurant Association used fees from mandatory food safety courses—paid by low-wage workers themselves—to fund lobbying efforts against minimum wage increases.

Source: New York Times (2023) How Restaurant Workers Help Pay for Lobbying to Keep Their Wages Low

CIVIL SOCIETY

1. Raise awareness of what a just transition looks like in practice

- **Showcase examples and share narratives to raise awareness** of what a just transition entails and what genuine worker engagement looks like; build the business case for worker-centred decarbonisation and adaptation efforts.
- **Advance justice-centred narratives that link climate action, labour rights, and equity** to steer public debate, even if adoption is incomplete. In the US, for example, the Green New Deal (while not enacted nationally) has influenced major legislative efforts—such as the US Inflation Reduction Act, which includes labour protections and equity provisions.[265]

2. Promote and facilitate collaboration among stakeholders

- **Convene and engage across movements and stakeholders**, strengthening the field and building momentum for change. Build the business case for each stakeholder group to participate and push for collaboration and collective action.

3. Enforce accountability and raise standards

- **Monitor labour rights violations, advocate for stronger protections, and hold businesses and governments accountable through campaigns and public pressure.** Instruments such as Questionmark's Supermarket Sustainability Index publicly compare retailers' performance on social and environmental criteria, creating pressure to improve.[266,267]

4. Build inclusion and community participation

- **Ensure that underrepresented voices—such as those of migrant, seasonal, or undocumented workers—have a role in transition planning and implementation.** This includes convening dialogues among governments, workers, businesses, and local communities, and supporting inclusive planning processes. Promote awareness of labour rights through community outreach, media campaigns, and multilingual resources. This is essential for reaching groups often excluded from formal union representation or traditional communication channels.

5. Provide services and facilitate structural reform

- **Provide legal aid, psychosocial support, and safe reporting tools to workers facing rights violations.** These services are especially critical for workers in informal or precarious conditions who may be at greater risk of exploitation or retaliation. In the US, for example, Farmworker Justice offers legal and health services to migrant farmworkers while advocating for structural reform.[268]
- **Form partnerships with stakeholders that promote fair trade, organic production, and responsible sourcing**, such as the Ethical Food Initiative (EFI), the EU Food Policy Coalition, or Fair Trade International to continue to raise the bar and lobby for corporate and government action.

Collaboration helps accountability

In Spain, the DiliGente project (run by a consortium of organisations including Oxfam Intermón, Andalucía Acoge, Conexión Social, and WWF Spain) gathers worker feedback on employment conditions, wages, and workplace treatment. It supports collaboration among businesses, civil society, and government, while providing targeted training to suppliers to help raise labour and environmental standards.

Sources: Löning – Human Rights and Responsible Business (accessed June 2025); Oxfam (2023) La participación significativa de las partes interesadas en los procesos de debida diligencia en derechos humanos; expert interviews

Framing the EU debate on sustainable food systems

The EU Food Policy Coalition, made up of over 60 unions, farmer groups, and consumer advocates, promotes coherent and socially just food policies. It has shaped debates like the European Commission's Farm to Fork Strategy, and developed scorecards rating Members of the European Parliament on their commitment to sustainable food systems.

Sources: EU Food Policy Coalition (accessed June 2025) PARTICIPANTS; EU Food Policy Coalition (2020) Raising the Ambition on Global Aspects of the EU Farm to Fork Strategy; EU Food Policy Coalition (2024) EU Parliament food systems scorecards

V. Final considerations

This report explored how transitioning to a net zero food system will affect millions of food workers across the EU, UK, and US—a subject that has attracted surprisingly little study to date.

While demand-side shifts, sustainable food production practices, and reduced food loss and waste can create environmental benefits, they may also threaten the livelihoods of already marginalised workers in sectors like livestock, commodity farming, and food processing. However, with effective accountability mechanisms, inclusive policy and planning, principled investment, and robust worker protections, the transition towards net zero can equitably create new, higher-quality jobs in sustainable plant agriculture, regional food processing, and alternative proteins.

We invite others to join us in discussing the implications of this report's findings, identifying areas for further research, and shaping opportunities for support and intervention in the pursuit of a just transition for food workers, such as:

1. **Country-, commodity-, and season-specific modelling** of the employment impacts of the transition to net zero in production and manufacturing

2. **Collecting and collating granular data** on marginalised groups in the food system—particularly ethnic minorities, women, and undocumented workers—at the national and regional levels

3. **Assessing the costs** and other financial implications of a just transition of the food sector

4. **Conducting detailed research** on long-term employment shifts driven by automation and technology, disaggregated by food value chain stage and commodity

5. **Analysing the impacts** of the transition on food workers beyond the UK, US, and EU, given the global reach of their food companies and supply chains—additional work is needed to understand what job impacts will look like outside of the regions included in this report

6. **Tracking and reporting** the speed of the transition (and whether it can be considered 'just') as it takes place, to inform stakeholder action and planning

VI. Annex

Methodology for Employment Impact Analysis

Introduction

This annex describes our approach to estimating how the transition to net zero GHG emissions will affect food system employment in Europe and the US. Our approach specifically seeks to identify which jobs will be displaced (job loss) or benefit from new opportunities (job gain), and how many. It is important to note that these figures are not based on new primary research.

Scenarios

Given the uncertainty about the pace of change, we ran the estimate under two scenarios across the EU, UK, and US:

1. **Ambitious Medium-term Scenario (5–15 years)** – an ambitious but realistic shift towards the Planetary Health Diet (PHD), requiring an accelerated pace of transition compared to current trends. This scenario excludes impacts from sustainable production and food waste reduction.
2. **Long-term Net Zero Scenario (15+ years)** – models full adoption of the PHD in both product mix and lower calorie intake. This scenario excludes impacts from sustainable production and food waste reduction.

Approach Summary

We used a three-step process to estimate net changes in the food system employment.

Step 1: Define employment baseline. We used public and proprietary datasets from the EU, UK, and US to estimate total employment in the food system.[269]

Step 2: Estimate the percentage employment change due to demand shifts. We modelled how changes in dietary patterns (based on alignment with the Planetary Health Diet) would affect demand for seven key commodity groups. For each commodity, we estimated the percentage change in employment based on projected shifts in consumption.

Step 3: Calculate employment impacts due to demand shiftss. Using the 1:1:1 demand–output–employment assumption, we calculated the net employment change for each commodity group by applying demand-driven changes to baseline employment estimates.

Our modelling does not represent new primary research and instead integrates three types of evidence:

- **Scientific frameworks:** The Eat-Lancet Commission's Planetary Health Diet anchors our assumptions around future demand and its ripple effects on jobs and supply chains.
- **Literature review:** We benchmarked job impact estimates using findings from sources including IDDRI, World Resources Institute (WRI), and studies such as The Lancet's "Ethical and Economic Implications of the Adoption of Novel Plant-Based Beef Substitutes in the USA" (2022).
- **Stakeholder interviews:** We conducted expert interviews with food system stakeholders to validate sector-specific trends and assumptions.

Underlying Modelling Assumptions

To focus on structural employment shifts, the modelling approach simplifies complex market dynamics and applies the following key assumptions:

- **Closed food system (no trade adjustment):** We assume that reductions in domestic demand for high-emission foods (e.g., red meat) are not offset by increased exports. This reflects a global shift towards net zero, in which all countries transition simultaneously.[270]

- **Commodity group modelling (no crop-by-crop modelling):** We modelled the impact of the transition on the seven most impacted commodity groups. We did not model the consumption patterns for each specific crop, meaning we did not account for seasonal growing changes or the varying production intensity of different crops throughout the year. This simplification means that the impacts of seasonality—such as higher labour demand during peak harvest periods—are not included in the analysis.

- **Demand–output–employment relationship (1:1:1 assumption):** We assume that, in the absence of trade effects, changes in consumer demand lead to proportional changes in production output, which in turn lead to proportional changes in employment. This approach is based on the modelling framework developed by Mason-D'Croz et al.[271] For example, in a scenario with a 60% drop in per capita beef consumption, the study found a 42.5% decline in cattle output and a 44.1% reduction in employment—validating the near-linear relationship. Where demand reductions do trigger export growth (as in some scenarios), this export growth can dampen the employment effect. However, we do not model these dynamics here due to our global transition assumption.

- **Stable population figures:** The forecast assumes flat populations, meaning food demand due to population size remains steady. This roughly aligns with projections for the EU (population peaking in 2025, decreasing by 1% by 2050) and US (6% growth from 2025 to 2055).[272]

- **Job estimates:** Estimates of the current number of workers in the food system are based on publicly available statistics (~54 million workers in the US, UK, and EU). The estimated job losses do not include undocumented workers, which are estimated to account for 5–9% of all workers in the food system.[273]

Country Risk Register

Figure 11: EU, UK, and US country risk register for workers across industries[274]

Country	Fundamental rights violations		Disregard of freedom of association	Working conditions		Breaking working norms	
	Child labour / worst forms of child labour	Forced labour / all forms of slavery	Freedom of association	Unequal treatment	Working hours	Adequate living wage	Health and safety
Austria	23	8	17	40	16	16	25
Belgium	23	11	50	37	17	32	36
Bulgaria	34	26	50	57	0	37	9
Croatia	22	30	33	47	n/a	38	29
Cyprus	32	21	n/a	66	20	34	13
Czech Republic	30	13	33	59	21	33	16
Denmark	15	6	17	27	14	11	36
Estonia	20	15	33	50	8	32	12
Finland	19	5	33	22	14	17	23
France	11	13	33	30	20	28	44
Germany	23	11	17	31	n/a	24.31	31
Greece	35	21	67	49	30	37	14
Hungary	24	19	67	62	4	35	16
Ireland	25	9	17	28	20	23	16
Italy	24	22	17	57	20	31	33
Latvia	25	17	33	53	2	37	18
Lithuania	20	21	33	43	4	35	13
Luxembourg	20	n/a	n/a	40	13	25	38
Malta	27	n/a	n/a	34	15	22	32
Netherlands	24	6	33	34	12	24	33
Poland	24	19	50	56	19	30	19
Portugal	26	6	33	31	17	29	29
Romania	30	26	50	60	6	36	21
Slovakia	22	16	33	53	12	31	5
Slovenia	20	9	n/a	35	15	26	26
Spain	23	10	33	45	15	34	32
Sweden	17	7	17	25	13	15	16
United Kingdom	22	14	67	42	26	34	30
United States	44	25	67	54	29	35	26

The Löning Country Risk Register Plus Data (2025)
Overall Risk: 0 to < 25 Low Risk, 25 to < 50 Medium Risk, 50 to < 75 High Risk, 75 to 100 - Very High Risk.
Empty values indicate insufficient data inputs to score

Glossary

Climate change	Long-term shifts in temperatures and weather patterns.
Food system	All activities and processes involved in getting food from farm to fork, including food production, manufacturing, distribution, preparation, and consumption.
Greenhouse gas (GHG) emissions	Gases released into the atmosphere that trap heat and contribute to global warming and **climate change.**
Job displacement	Involuntary job loss due to external factors unrelated to performance, like automation, restructuring, or economic shifts.
Job opportunities	Employment prospects or chances for individuals to find new work.
Just transition	There are many definitions, but in this report, it represents a framework that ensures that the benefits of the transition to a **net zero** economy are shared widely and those who stand to lose economically—including countries, regions, industries, communities, and workers—are supported.
Manufacturing	The process of turning raw ingredients into finished food products, including **processing** and packaging.
Net zero	A state of balance between the amount of **greenhouse gases** emitted into the atmosphere and removed from the atmosphere. Achieving net zero means that any emissions that cannot be eliminated are offset by measures that remove an equivalent amount of greenhouse gases, such as through carbon capture or reforestation.
Processing	A stage of food **manufacturing** that transforms raw materials (like grains, fruits, vegetables, and animal products) into food products. It can be subdivided into further steps: primary processing prepares raw food materials for use (e.g., milling or pasteurising), secondary processing refers to another level of processing (e.g., baking or fermenting), and tertiary processing often includes production of ready-to-eat or convenience foods (e.g., frozen meals or snacks).
Production	Growing and harvesting crops and rearing livestock for food.
Retail	The sale of food directly to consumers through (for example) supermarkets, convenience stores, and online food shops.

Scope 1 and 2 emissions	Scope 1 emissions are released directly by owned or controlled sources, such as fuel combustion in company-owned vehicles or facilities; scope 2 emissions are indirect emissions from the consumption of purchased electricity, steam, heating, or cooling.
Scope 3 emissions	Indirect emissions from activities across an organization's value chain, including suppliers and consumers. Scope 3 emissions include all sources not within an organization's **scope 1** and **2** boundary. The scope 3 emissions for one organization are the scope 1 and 2 emissions of another organization. Scope 3 emissions, also referred to as value chain emissions, often represent the majority of an organization's total **greenhouse gas** (GHG) emissions (source: "Scope 3 Inventory Guidance", US Environmental Protection Agency)
Seasonal workers	Individuals employed on a temporary basis, typically for a specific period during the year, to meet increased demand in certain industries or businesses.
Food service	The preparation, delivery, and sale of food and beverages for immediate consumption, typically outside the home, in settings such as restaurants, canteens, catered events, and takeaway outlets.
Transition	The process or a period of changing from one state or condition to another.
Food workers	In this report, all individuals engaged in labour across the **food system**—from **production, processing, distribution to retail, and food service**—encompassing both formal and informal employment, as well as documented and undocumented workers. However, due to data limitations, at certain points in this report the number of workers in the analyses only accounts for documented workers.

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