



## PART 2

# Key Economic Systems



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The first part of this Report outlines a new global growth agenda that has the potential to deliver economic growth, development, and climate objectives together, with a focus on how to decisively accelerate action and deliver this transformative agenda at scale. Implementing this agenda must happen in each country at the national and sub-national level and **in five key economic systems**, namely: energy, cities, food and land use, water, and industry. These are the areas where we see the greatest potential for growth, as well as the greatest potential to reduce the risks of harmful climate change. As such, they are the areas in which to prioritise efforts to reorient policy and institutions, scale up and push investment, foster technology and innovations, and manage the transition in a just and inclusive way. The role of investment and innovation is critical across the whole agenda.

For each key economic system, Part 2 of the Report identifies the main trends or issues that are shaping the current state of play and that are poised to create the greatest impacts on longer-term pathways, opening up transformative opportunities for acceleration of the new growth agenda. Significant changes in just the last few years have already fundamentally changed the landscape of these economic systems. These include the spread of exciting new technological advancements, political and policy shifts, or larger macroeconomic, consumer-driven, and societal forces. This part of the Report examines how to harness these for the decisive change of direction needed.

In each of the key economic systems, special attention is given to the important **cross-cutting themes** of successful change identified in Part 1. Across all five systems, securing finance, driving greater innovation,

providing the right incentives, and managing a just transition (see Box 5) will be essential to drive the transformative change needed. The important, but often neglected, role of women and girls in the transition is given particular attention in this Report, as is the need to strengthen adaptation and resilience in the face of some amount of climate change that is already inevitable. The pace and scale of change needed to deliver this economic transition is unprecedented. While the economic, societal and climate benefits of making the transition are increasingly apparent, we know from experience that it will not be easy. New markets, business opportunities, and quality jobs will open up, yet in many cases these will also require shifts away from incumbent, polluting and inefficient industries, which have strong and sometimes well-organised political influence. There will be a need to sensitively and respectfully manage associated dislocation and other challenges for communities in transition.

For each of the five economic systems, the Report has selected **two to five specific opportunities** that can be seized to accelerate and rapidly scale up efforts to deliver growth and climate action together. The Report highlights the latest evidence of the potential benefits; compelling ‘proof points’ or examples of successes identified, along with how to address roadblocks to implementation and scaling action; and finally, a few **specific accelerators** that could dramatically boost efforts for each opportunity. Some new modelling-based analysis was developed for this Report to assess the potential economic, social, and environmental benefits of scaling up action in these opportunities (see Box 4).

## Box 4

### Understanding the Economic and Societal Benefits of Ambitious Climate Action: Modelling Analysis for this Report Using the E3mE Model

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The policies and interventions for accelerating climate action discussed in this Report are strongly supported by empirical evidence of the economic, social, and environmental benefits they can deliver. The Report draws on a number of existing modelling exercises, as well as new modelling undertaken in partnership with Cambridge Econometrics, to assess the potential impacts of scaling up approaches that can both promote economic growth and reduce the risks of climate change.

The macroeconomic model E3ME (e3me.com), used for this analysis, is an integrated, global, dynamic simulation macro model that is estimated by econometric methods for a large set of countries, regions, and sectors of economic activity. Its structure is based on the system of national accounts, coupled with bottom-up technology diffusion models for the power and transportation sectors complementing the macro-econometric framework. E3ME has a dynamic error correction specification, which is important when considering short- and medium-term analysis and rebound effects. The model provides an approach that can add further insights to those from more traditional Computable General Equilibrium (CGE) models. The model is better able to reflect the interaction between the real economy and the financial system, and regulation and other policies may lead to increases in output if they are able to draw on spare economic capacity. The E3ME model is also better able to reflect the impacts on labour participation and employment. These are critical to assessing the socio-economic benefits of ambitious climate policies.

E3ME includes 59 countries or regions, 43 industry sectors, 28 categories of household expenditure, 22 different users of 12 different fuel types, and up to 14 types of air-borne emissions including six GHGs. The model can produce a broad range of economic indicators, as well as various energy and environment indicators. These include GDP and its aggregate components (household expenditure, investment, government expenditure, and international trade); sector output and gross value added, prices, trade, and competitiveness effects; international trade (imports and exports) by sector; consumer prices and expenditures; sector employment, unemployment, wage rates, and labour supply; energy demand, by sector and by fuel, and energy prices; CO<sub>2</sub> emissions by sector and by fuel; and social and health outcomes, including government health care costs and the number of years of life and work lost due to emission-related effects.

In conducting the empirical modelling exercise, the New Climate Economy and Cambridge Econometrics teams jointly defined a set of six economic modelling scenarios for climate action including in cities (urban retrofits, urban densification, and promoting EVs); energy (carbon pricing, subsidy and energy reform, and reducing energy waste); and industry and innovation (increased efficiency); together with implicit assumptions on policies for food and land use. A combined global climate action scenario that integrates all of these policies was also produced. The results of the scenarios are highlighted in this Report and elaborated in a Technical Note published separately.<sup>129</sup>

As a selective list, the opportunities and their accelerators are not meant to be exhaustive or to cover all the actions needed in each system. Rather, they have been chosen based on four underlying criteria that would substantively contribute to the new growth model, namely:

- **The potential to deliver clear and significant socio-economic benefits**, particularly in terms of economic growth, ensuring quality jobs, raising incomes, providing for vulnerable communities, reducing impacts on health, and reducing economic or social inequalities, including around gender or poverty.
- **The potential to deliver major climate benefits**, in terms of transformational reductions in emissions and the building of climate resilience, and consistent with the goal of the Paris Agreement to keep global average temperature rise well below 2°C.
- **Solutions that have been successfully demonstrated**, building on existing proof points of success in countries, cities, and businesses around the world. Practical policy-relevant experiences can help ensure a realistic understanding of the challenges, as well as the financing opportunities, the policies and incentives

needed, and the critical governance choices required to accelerate the new climate economy.

- **The existence of clear approaches that economic and political decision-makers can take to replicate these opportunities at scale**, engaging relevant champions and coalitions to help deliver them.

The individual opportunities and their related accelerators are all explicitly grounded on actions that are already taking place, not on distant innovations or emerging technologies that are yet to be tried at scale. But most opportunities are only being seized in a piecemeal manner, with only incremental and halting progress. Co-ordinated and concerted acceleration could yield dramatic progress.

Policy-makers, business and other leaders must now turn the ad hoc advancements in each of these systems into a broad movement of action and a decisive shift commensurate with what is needed to respond to the global climate challenge. The opportunities described in the following pages offer practical guidance on how to accelerate progress for economic and political decision-makers, including national and local governments; development finance institutions; investors; and financial and business leaders. They are the building blocks of the new growth model.

Photo credit: Flickr: Tommy Clark



## Box 5

### Ensuring a Just Transition: “There are no jobs on a dead planet”.<sup>130</sup>

The emerging new growth model has the potential to deliver incredible economic and development benefits together with climate goals, leveraging recent technological advances, new business models, and innovative financing mechanisms. This Report highlights a range of examples of successes in countries and sectors around the world that are delivering real benefits to communities today and will do so for generations to come.

The scale and pace of the broader economic transition that the world is now facing is unprecedented. We are already in the midst of major structural changes, including rapid urbanisation, increasing globalisation, a shift to service-based economies, and increasing automation. As with major economic and technological transitions of the past, this one will not necessarily be easy. New markets, business opportunities, and jobs will open up, but there will also be a shift away from the current high carbon-emitting industries and modes of energy, transport, and land use. Unless this transition is carefully and responsibly managed, there is a real potential for stranded assets, communities, and workers, as well as the risk of exacerbating the social exclusion of the poorest and most vulnerable. The transition to a low-carbon, resilient economy is just one part of this much broader transformation, and—if managed well—has the potential to deliver more equitable and prosperous growth. This transition is not only about phasing out polluting and unsustainable activities in various sectors, but also about diversifying local economies, generating new jobs and new industries, new services and new skills, all of which requires new types of investment and accompanying policies.<sup>131</sup>

Open and transparent dialogue to plan for the transition will be essential, bringing together government, business, trade unions, civil society, and communities.<sup>132</sup> Local universities and trade schools can also play a key role in envisaging and training for a more diversified economy in affected regions. Such broad-based and inclusive dialogues can help to identify specific measures to ensure a just transition, helping to reduce fears, opposition, and both inter-community and inter-generational conflict. Dialogues can bring together trade unions, government, and industry representatives to find common ground and ways forward to ease the transition.<sup>133</sup> According to the International Labour Organisation (ILO), a just transition is a bridge from where we are today to a future where all jobs are green and decent, poverty is eradicated, and communities are thriving and resilient.<sup>134</sup> Green jobs are those which support improving energy and resource material efficiency, limiting GHG emissions, minimising waste and pollution, protecting and restoring ecosystems, and supporting adaptation to climate change.

As noted, the shift to a low-carbon and climate-resilient economy is only one—potentially small—part of a much broader economic transition that is under way, including the so-called ‘Fourth Industrial Revolution,’ characterised by increasing globalisation and the rise of automation.<sup>135</sup> Indeed, the growth of new technologies and artificial intelligence (AI) is having a profound effect on labour markets, with some economists suggesting that automation could potentially replace over half of all jobs by 2055.<sup>136</sup> Traditionally middle-skill jobs (such as machine operators or clerical workers) are already declining compared to high- and low-skill jobs: across 24 OECD countries, all but two experienced some degree of job polarisation between 1995 and 2015.<sup>137</sup> Some of this shift can be explained by globalisation and offshoring, but there is also an important element related to technological process and growing automation of middle-skill jobs in manufacturing.

Growing social inequality and lack of inclusion in the old economic growth model is of particular concern and addressing it will be a necessary part of any just transition towards a new growth approach that minimises climate risks. In 2017, an estimated 82% of the wealth created globally went to the top 1% of the world’s population.<sup>138</sup> Wages in many parts of the world remain flat. Despite important recent progress in tackling poverty, just under half of Africa’s population still lacks access to electricity today.<sup>139</sup> Women continue to be under-represented and under-paid compared to male counterparts in the workforce in most sectors of the economy. Some studies suggest that growing automation may serve to exacerbate these inequalities, unless policies are implemented to actively manage the impacts.<sup>140</sup>

A well-managed and just transition is needed to ensure that the new growth agenda delivers not only economic growth, but also alleviates poverty, strengthens social inclusion, improves biodiversity and ecosystem services, and reduces the risks that a changing climate will pose to development prospects. A just transition requires social dialogues, clear plans, and proactive policies. It requires active labour market policies and enhanced social security systems, while minimising disincentives to work. Robust social protection systems are essential, enabling the necessary support for the poor and vulnerable to improve livelihoods and seek formal employment and for workers and their families to meet basic needs during periods of unemployment, re-training, or education.<sup>141</sup> The more inclusive the social protection system, the more likely disenfranchised and displaced workers will feel empowered to move into new jobs, and the better communities will be at supporting economic diversification.

## Box 5

### Ensuring a Just Transition: “There are no jobs on a dead planet”. (continued)

While the transition to a low-carbon economy is only a part of this much broader economic transformation, it is often an easy target to ‘blame’ for some of the job losses or dislocations that are taking place. Disentangling the impacts of climate-related policies from this broader transition can help to build political support for climate action and identify where there are real impacts that need to be carefully managed.

This Report highlights some of the examples where processes are facilitating a just transition to a new climate economy, identifying some of the barriers and challenges faced, as well as some of the factors that are leading to progress and successes. A number of examples are highlighted throughout the Report in more depth, a few of which include measures such as:

- Commitments to phase out coal use in the energy system and successful experiences in phasing out subsidies to fossil fuel production and exploration, including policies and approaches to carefully manage the transition for affected workers and communities. For example, following their 2016 and 2018 commitments to the phase-out of coal, the Province of Alberta and the Government of Canada have established social dialogues with coal workers and their communities (see also Box 17); Alberta’s carbon price revenues were allocated to support the transition for coal communities and others;<sup>142</sup> and China established a dedicated multi-billion-dollar fund for retraining, reallocating, and the early retirement of workers laid off due to coal and steel overcapacity as part of its 13th Five-Year Plan (2016-2020). Most recently, in 2018 Germany launched its “Commission on Growth, Structural Change and Employment” to develop an overarching approach to managing the full range of impacts of the phase-out of coal in line with national climate commitments. It is seen as a potential model for just transition dialogues (see also Box 17).<sup>143</sup> The new Powering Past Coal Alliance, with over 60 partners including governments, organisations, and leading businesses, has the potential to galvanise social dialogues, building on experiences to date, and manage the transition in over 30 signatory countries or states (see also Section 1.C).<sup>144</sup>
- Clean energy access policies typically target the urban poor and hard-to-reach rural communities and can offer huge economic and social benefits, notably for women and children. These policies can also provide important sources of income for locals providing the services. Brazil’s successful approach to achieve near universal access to clean cooking in urban areas included the development of national infrastructure for liquefied petroleum gas (LPG) production and distribution, involving private entrepreneurs and subsidies to the poorest families to ensure affordability.<sup>145</sup> In rural Bangladesh, a government-led results-based financing programme supports private operators in implementing solar home systems in rural communities; small subsidies are offered to the poorest households, and the largest private operator made the training and employment of local women a pillar of its business model (see Section 1.D).<sup>146</sup>
- Approaches to restoring degraded lands back into productive use in countries from Ethiopia to Niger to China have ensured these efforts successfully lifted millions of people out of poverty and raised local farmer incomes (See Section 3.D).
- An economy-wide approach to the transition was launched in Norway through the Expert Committee on Green Competitiveness, which delivered its recommendations to the Prime Minister in October 2016 after extensive consultations amongst business, workers, and civil society. As part of this process, 11 key sectors—including transport, industry, petroleum and agriculture—developed long-term road maps to transition their sectors to a low-carbon growth model while maintaining global competitiveness. This has helped business, government leaders, and society more broadly overcome inertia and identify together the opportunities to transition more rapidly from a heavily fossil fuel-dependent economy to a more diversified, low-carbon economy (see Section 1.C).
- Uruguay’s rapid energy transition in recent years shows the country moving from dependence on fossil fuel-based electricity and oil imports to having enough renewable power not only to supply over 94% of their own electricity system, but also to be able to export one third of the power they generate to Argentina. Uruguay has implemented ILO guidelines for a “just transition towards environmentally sustainable economies and societies for all” as part of this process, to assist the country in creating employment, ensuring decent work opportunities and social well-being in the process of a just transition towards a greener economy.<sup>147</sup>

As this Report illustrates, sector by sector, the low-carbon, climate-resilient aspects of the broader transition to a new growth model can unlock multiple benefits—a boost to growth in countries at all stages of development, new jobs in innovative industries, poverty alleviation, and improvements in other key indicators of quality of life. Ensuring that the transition is just is fundamental to building a safer, more sustainable, and prosperous world for all.