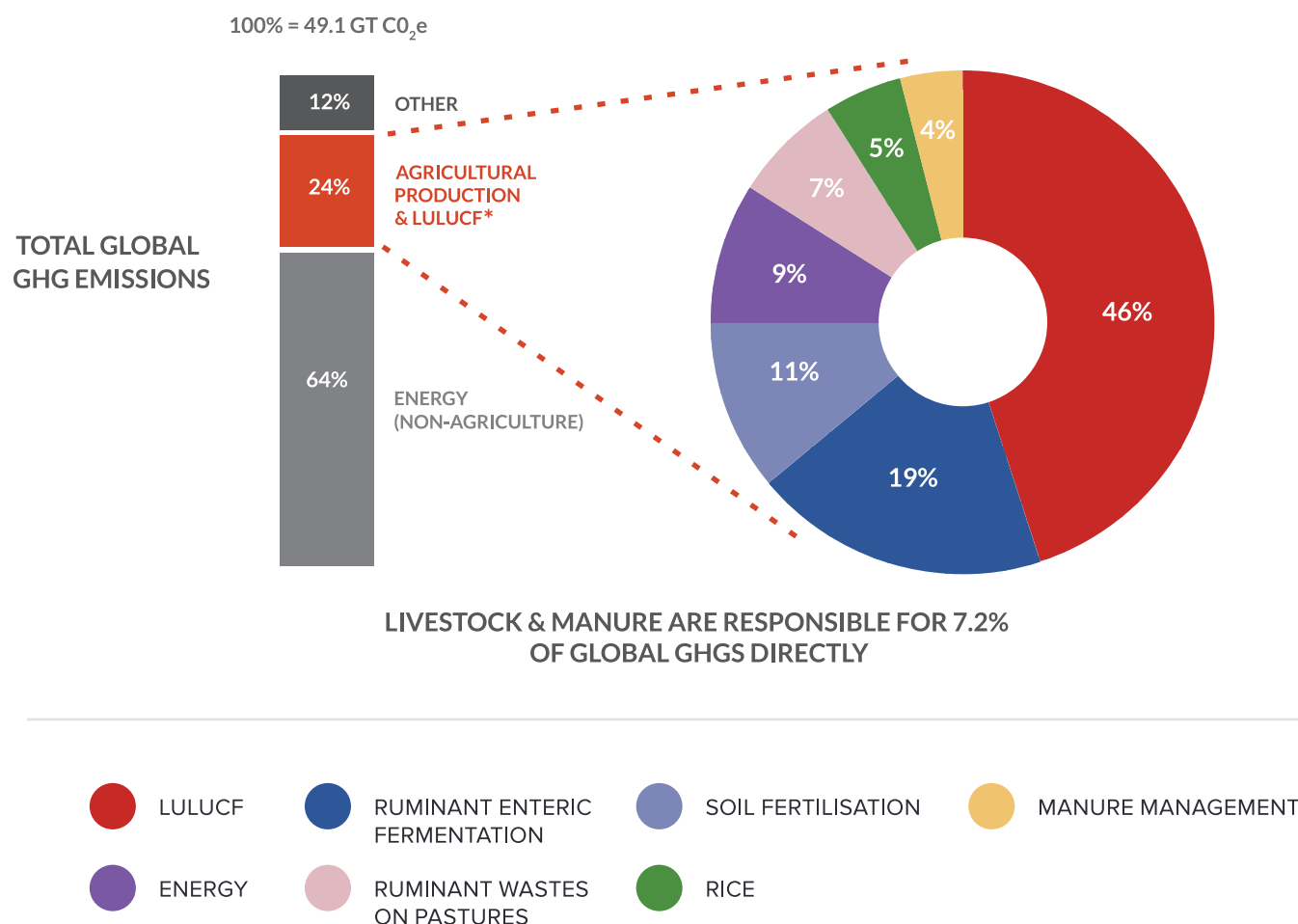


Figure 7

## Global AFOLU greenhouse gas emissions by sub-sector, 2010.



Source: World Resources Institute analysis based on UNEP, 2012; FAO, 2012; EIA, 2012; IEA, 2012; and Houghton, 2008, with adjustments.<sup>31</sup> \* Land Use, Land-Use Change and Forestry (LULUCF)

of carbon-rich forest. They are also crucial to many developing economies: in countries in the US\$400–1,800 per capita GDP range (2005\$), many of them in Asia, the World Bank found agriculture was 20% of GDP on average; in sub-Saharan Africa, it was 34%, and accounted for almost two-thirds of employment and a third of GDP growth in 1993–2005.<sup>32</sup> Globally, 70% of the poorest people live in rural areas and depend on agriculture for their livelihoods, mostly in the tropics.<sup>33</sup>

Developing countries are also where more than 80% of the global demand growth for agricultural and forest products will occur over the next 15 years.<sup>34</sup> By 2050, the world's farms will need to produce 70% more calories than in 2006, mainly due to population growth, rising incomes and changing diets in developing countries.<sup>35</sup> Meeting this new demand will be critical to growth, food security and poverty alleviation; it will also create huge opportunities for businesses – from small farms and local businesses, to multinationals. How this demand is met will be critical to climate outcomes.

## 2.1 Supply-side measures in agriculture

The “Green Revolution” – a multi-decade effort to modernise farming in the developing world – boosted crop yields by developing high-yield grain varieties and sharply increasing the use of agricultural inputs (irrigation water, fertilisers). Many of the measures needed today are more location-specific, addressing issues such as drought, floods, pests and saltwater intrusions. There are already promising innovations, such as “Scuba rice”, which can withstand submersion in water, a common situation as floods increase in South and Southeast Asia. The variety was introduced in India in 2008 and has since been adopted by 5 million farmers in the region.<sup>36</sup>

For major cereal crops, the research supported by the Consultative Group on International Agricultural Research (CGIAR), a US\$1 billion-a-year global partnership, will be invaluable. Public-sector support in individual countries is also crucial, particularly for rice and “orphan crops” – some starchy root crops, vegetables, legumes, etc. – that have little global market value but are



A global report inevitably has to generalise across very different kinds of economies. But the report seeks to recognise the different circumstances that diverse countries face.

The approach to economic analysis taken by the report goes beyond a traditional static view of how economies work. It has been framed in a dynamic context of change and transformation. Guided by the advice of the Commission's Economics Advisory Panel, the project team has drawn widely on economic history, the economics of public policy and of risk, theories and experiences of development and poverty reduction, and international, institutional and behavioural economics, amongst other approaches.

Economic models can generate precise numbers – for GDP growth, jobs or emissions – but they can only ever offer approximations of the future. Too much is unknown about the course of technological and structural change, with the key processes difficult to capture formally. Too much that is of value – such as people's health, the reduction of risk, the sustainability of the natural environment – is hard to quantify. John Maynard Keynes once said, "It is better to be roughly right than precisely wrong". The report gathers the available quantitative evidence. But the Commission and its Economics Advisory Panel would warn against the search for false precision. It is judgement, informed by a range of perspectives and evidence, that will lead to better decisions. The report is intended to provide resources for such judgements.

This Synthesis Report is structured in three parts. Part I: Overview summarises the report's overall argument.

It reviews the key relationships between growth and climate change, and sets out the core framework of analysis underpinning the report.

Part II comprises a summary of the core chapters of the full report. Sections 1-3 discuss the key systems, Cities, Land Use and Energy, drawing on evidence from across the world on how economic performance can be improved at the same time as the trajectory of greenhouse gas emissions is reduced. Sections 4-6 examine how economic and fiscal policies, and policies and actions in the fields of finance and innovation, can help drive the transition to a low-carbon, climate-resilient economy. Section 7 discusses a number of forms of international cooperation which can enhance and strengthen this effort, including a new international climate change agreement.

Part III presents a summary of the Commission's Global Action Plan. This brings together the report's conclusions into a 10-point plan of key recommendations, aimed at the international community of economic decision-makers.

*Better Growth, Better Climate* is a report for consultation. It is not intended as – and could not be – the final word on the many complex issues it explores. The Commission does not expect universal agreement with its conclusions. But the issues it examines are urgent and critical, and the Commission hopes it will stimulate both debate and action.

## Executive Summary

The Global Commission on the Economy and Climate was set up to examine whether it is possible to achieve lasting economic growth while also tackling the risks of climate change.

Its report seeks to inform economic decision-makers in both public and private sectors, many of whom recognise the serious risks caused by climate change, but also need to tackle more immediate concerns such as jobs, competitiveness and poverty. The report brings together evidence and analysis, learning from the practical experience of countries, cities and businesses across the world.

**The report's conclusion is that countries at all levels of income now have the opportunity to build lasting economic growth at the same time as reducing the immense risks of climate change.** This is made possible by structural and technological changes unfolding in the global economy and opportunities for greater economic efficiency. The capital for the necessary investments is available, and the potential for innovation is vast. What is needed is strong political leadership and credible, consistent policies.

**The next 15 years will be critical, as the global economy undergoes a deep structural transformation.** It will not be “business as usual”. The global economy will grow by more than half, a billion more people will come to live in cities, and rapid technological advance will continue to change businesses and lives. Around US\$90 trillion is likely to be invested in infrastructure in the world's urban, land use and energy systems. How these changes are managed will shape future patterns of growth, productivity and living standards.

**The next 15 years of investment will also determine the future of the world's climate system.** Climate change caused by past greenhouse gas emissions is already having serious economic consequences, especially in more exposed areas of the world. Without stronger action in the next 10-15 years, which leads global emissions to peak and then fall, it is near certain that global average warming will exceed 2°C, the level the international community has agreed not to cross. On current trends, warming could exceed 4°C by the end of the century, with extreme and potentially irreversible impacts. By building up greenhouse gas concentrations and locking in the stock of high-carbon assets, delay in reducing emissions makes it progressively more expensive to shift towards a low-carbon economy.

**Future economic growth does not have to copy the high-carbon, unevenly distributed model of the past.** There is now huge potential to invest in greater efficiency, structural transformation and technological change in three key systems of the economy:

- **Cities** are engines of economic growth. They generate around 80% of global economic output, and around 70% of global energy use and energy-related GHG emissions. How the world's largest and fastest-growing cities develop will be critical to the future path of the global economy and climate. But much urban growth today is unplanned and unstructured, with significant economic, social and environmental costs. As pioneering cities across the world are demonstrating, more compact and connected urban development, built around mass public transport, can create cities that are economically dynamic and healthier, and that have lower emissions. Such an approach to urbanisation could reduce urban infrastructure capital requirements by more than US\$3 trillion over the next 15 years.
- **Land use** productivity will determine whether the world can feed a population projected to grow to over eight billion by 2030, while sustaining natural environments. Food production can be increased, forests protected and land use emissions cut by raising crop and livestock productivity, using new technologies and comprehensive approaches to soil and water management. Restoring just 12% of the world's degraded agricultural land could feed 200 million people by 2030, while also strengthening climate resilience and reducing emissions. Slowing down and ultimately halting deforestation can be achieved if strong international support is combined with strong domestic commitment to forest protection and rural income development.
- **Energy** systems power growth in all economies. We are on the cusp of a clean energy future. Coal is riskier and more expensive than it used to be, with growing import dependence and rising air pollution. Rapidly falling costs, particularly of wind and solar power, could lead renewable and other low-carbon energy sources to account for more than half of all new electricity generation over the next 15 years. Greater investment in energy efficiency – in businesses, buildings and transport – has huge potential to cut and manage demand. In developing countries, decentralised renewables can help provide electricity for the more than one billion people without access.

Across all these systems, three “drivers of change” need to be harnessed to overcome market, policy and institutional barriers to low-carbon growth:

- **Raising resource efficiency** is at the heart of both growth and emissions reduction. In many economies, both market and policy failures distort the efficient allocation of resources while simultaneously