

Tax as a force for good

Rebalancing our tax
systems to support
a global economy fit
for the future

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About this discussion paper

This discussion paper explores how shifting tax burden from labour to natural resource use, pollution and consumption could help meet the goals of the Paris Climate Agreement, the UN Sustainable Development Goals (SDGs) and an inclusive, circular economy.



ABOUT THE AUTHOR

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Foreword



The art of tax policy is to strike a balance between securing the revenues needed by governments to finance their social and economic programmes and maximising the contribution of the tax system to a thriving, efficient and inclusive economy.

Achieving these multiple objectives is always difficult but particularly so in times when societies are going through profound change in terms of how economies function and where benefits from economic activity end up. How to make sure that the rules of international taxation avoid double taxation but also double non-taxation? How to ensure a level playing field between businesses that rely strongly on digital platforms and those that do not? How can labour taxes adapt to the gig economy? What role for taxes in mitigating rising inequality of income and of opportunity? These are just some of the questions that tax policy makers grapple with.

In addition to all this, the OECD has long argued that taxes have major potential as policy instruments to help curb greenhouse gas emissions, environmental pollution and biodiversity loss. Well-designed environmental taxes provide households and businesses with financial incentives to reduce pollution in ways that suit them best, and this reduces pollution at lower cost than less flexible forms of government regulation are able to deliver. This is a matter of cost-effective environment policy. Environmental taxes also raise revenue, and in this sense are a matter of tax policy. How to deploy the revenues? Answers to this question have a major impact on the economic case for environmental taxes – revenues should not be squandered – and on the social acceptance of environmental taxes.

The discussion in the paper directly speaks to the interaction between tax policy and environment policy aspects of environmental taxation. It argues that shifting the tax burden from work to environmentally harmful activities is both good for the environment and strengthens the inclusive growth potential of our economies. OECD work has similarly identified labour tax cuts as one promising option for using environmental tax revenues. Depending on countries' specific contexts, other good options can include business tax cuts, domestic resource mobilisation, etc. The point is that decisions on revenue use can make or break the case for environmental taxes. Discussions and decisions on environmental taxes therefore best take place in dialogue between environment and tax policy makers.

Tax reform can improve environmental performance while contributing to inclusive growth. As is shown in the paper, however, tax policy is not living up to its potential and signs of change are not particularly strong. Policy-makers should not be asleep at the wheel, but instead take on the difficult task of turning the potential of environmental tax reform into a politically workable proposition. The analysis below provides evidence and arguments to that end, for both the tax and environment policy communities.

Pascal Saint-Amans

Director of the Centre for Tax Policy and Administration, OECD

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Executive summary

AN INTER-CONNECTED WORLD

Humanity is facing massive challenges. The most daunting task will be to adapt the metabolism of our economies to match the carrying capacity of the earth and stay below two degrees Celsius of global warming. According to the latest Intergovernmental Panel on Climate Change (IPCC) report, global carbon emissions must start to reduce well within 12 years if we are to prevent large-scale natural and human risks from becoming irreversible reality. We face equally important social challenges in our societies, including enabling a growing global population to develop to their full potential and find decent work. The UN Sustainable Development Goals (SDGs) connect the social and ecological challenges that will dominate the global agenda for the upcoming decades.

Governments need to develop coherent strategies to deal with these megatrends. Tax must play an important part in this, as tax costs have a fundamental impact on investment, employment and consumption decisions.

TAX AND THE FUTURE OF WORK

In many countries, unemployment, underemployment and vulnerable employment are placing unprecedented demands on the population and national budgets. Ageing populations are straining national pensions and healthcare budgets. New technologies

are enabling business models that revolutionise employment and, consequently, change the amount of taxes that governments can raise from businesses and workers. This trend makes it even more important to foster inclusive economies in which labour demand is sufficient to enable people to find new roles for those whose tasks and jobs are taken over by machines.

TAX SYSTEMS NEED TO ADAPT

Considering the challenges societies are facing today, it is time to rebalance our tax systems. Just as we now see our planet as an interconnected system, we must take a fresh look at our tax systems as a whole. Specific tax measures, such as a carbon tax, landfill levies or taxes on single-use plastic, may help but they are no longer enough. In order to develop tax systems that are fit for the 21st century, it is necessary to think more widely about what governments should be taxing, and how the tax revenues should be used.

LABOUR TAXES AND GREEN TAXES

This discussion paper focuses on taxes that are less publicised than corporate income tax but directly related to today's socio-economic challenges: labour taxes (which include personal income tax, payroll taxes and social security contributions) and green taxes (on pollution and resource-use such as carbon emissions, fossil fuels, water,

waste and metals). Currently, tax revenue is raised largely on employment. In OECD countries, labour taxes account for 52.1% of total public revenue raised, while green taxes account for only 5.3%. There is some variation across continents: African, Asian, Latin American and Caribbean countries may rely more on taxes on goods and services. Still, labour taxes provide a significant share of revenues in all regions – and substantially more than green taxes.

Why should governments minimise the tax burden on labour?

LABOUR TAXES AFFECT EMPLOYMENT DECISIONS

Over the years, institutions such as the World Bank, the OECD, the International Monetary Fund (IMF), the European Commission, the Eurogroup and the European Council have called for lower labour taxes to reduce unemployment. High payroll costs encourage employers to gain efficiency by minimising the number of employees. They could also tip the scales towards more precarious ways of working: insecure, temporary or part-time jobs (including in the 'gig economy' or 'platform economy'), and informal employment (where people work without a legal contract). In general, a lower tax burden on labour should benefit all sectors that rely heavily on human resources, from innovative businesses undertaking research and development, to hospitals and universities.

Avoiding a high tax burden on labour, while boosting social protection, will be indispensable to fostering inclusive economies.

Avoiding a high tax burden on labour, while boosting social protection, will be indispensable to fostering inclusive economies. A key option for financing such a strategy is to shift the tax burden towards pollution and resource-use, as these tend to be relatively tax-free, or even subsidised.

ENVIRONMENTAL COSTS ARE PASSED ON TO SOCIETY AND FUTURE GENERATIONS

The costs of the environmental megatrends such as climate disruption and pollution are becoming ever more clear. The Lancet Commission estimates global welfare losses from pollution at \$4.6 trillion a year, or 6.2% of global economic output. The long-term negative impacts on the global economy caused by carbon emissions in 2017 alone were \$16 trillion. Such costs are 'externalised', meaning that they are passed on to society, individuals and future generations, rather than absorbed by the polluter. While international organisations agree that carbon pricing is key to achieve the goals of the Paris Climate Agreement, at the moment, 46% of carbon emissions are still free of charge. Half of the emissions covered by carbon pricing mechanisms are priced at less than \$10 per tonne.

GREEN TAX USE IS LIMITED

More than a hundred options for 'green' taxes are available to governments for applying the 'polluter pays' principle, including putting a price on air pollution (such as carbon emissions), fossil fuels, waste and water. Green taxes are considered growth-friendly, as they are less distortive to the economy than taxes on labour and income. Currently, however, their use is limited. Over the past 15 years, environmental tax as a share of GDP has declined in 52 out of 79 countries in the OECD database. In addition to relatively low green tax levels, global fossil fuel subsidies amounted to \$373bn in 2015.

INCREASE GREEN TAXES, REDUCE LABOUR TAXES

The basic principle is simple: 'tax less what you want more of.' The OECD, IMF, World Bank, European Commission and International Labour Organisation (ILO) have all called for a change from labour taxes towards tax on resource-use and consumption. Business groups such as the World Business Council for

Sustainable Development (WBCSD) and the Business and Sustainable Development Commission (BSDC) have also supported such a tax reform. Economic modelling has shown that switching €554bn of taxes from labour to pollution and resource use in the European Union could add €842bn in GDP, enable 6.6m more people to be in employment, cut carbon emissions by 8.2% by 2020 and save €27.7bn on the energy import bill over a five-year period.

BARRIERS TO IMPLEMENTATION

Although the basic principle is simple, rebalancing our tax system is not easy for a number of reasons. First of all, tax policy is driven by politics, and the relatively short cycles in politics makes it difficult to develop long-term tax strategies. Secondly, nobody really likes to pay for something that was previously free of charge. Also, industries with an interest in keeping the status quo often have a stronger voice than other interest groups such as non-governmental organisations (NGOs), healthcare organisations or small and medium-sized enterprises that may have an interest in a transition. Finally, there is the challenge of how to coordinate tax reform internationally, as shifting financial incentives will change trade patterns.

THE TAX SHIFT IN PRACTICE

Despite the barriers, tax shifts have been implemented in several countries, including the UK (in 1996), Germany (2007), and Colombia (2012). In the 1990s and early 2000s, seven European countries took steps to shift the tax burden from labour to energy and transportation. In 2008, the Canadian province British Columbia began to tax fossil fuel users while recycling revenue through tax cuts on both labour and capital, and an additional tax credit for low-income households.

USE OF REVENUES

A lower tax burden on labour can generally be achieved by using revenues from green taxes towards a reduction of personal income tax, payroll taxes and social security contributions. An often-heard worry is that green taxes could increase income inequality: they hit low-income households more, as they pay higher shares of their incomes towards energy-intensive goods. It is, however,

It is possible to prevent taxes from increasing income inequality, if the green tax revenues are used to benefit the poorest sections of the population.

possible to prevent taxes from increasing income inequality if the revenues are used to benefit the poorest sections of the population. Plenty of policy options are available for alleviating the impacts on specific households: compensating retired pensioners for the increase in heating costs, for example. Benefits can take the form of (means-tested) tax credits, exemptions, allowances or deductions. In some countries, cash transfers might ease the transition for the unemployed and those who live in poverty. The right solution will differ from one country to another. If desirable, green taxes can also be made more progressive by applying block tariffs (higher rates for higher usage) or a tax-free threshold (eg leaving a certain amount of water or energy untaxed). Careful design and implementation can alleviate many of, if not all, the concerns about discriminatory effects. Depending on the desired outcomes, revenues could also be used for increased social protection (including pensions), education and health care.

THE EVOLUTION NEEDS TO START NOW

The foundations of modern tax systems were laid down in the era of the industrial revolution; before globalisation and mass consumption, before the emergence of climate disruption and water supply risks, and before digitisation and automation. It is time for them to evolve – but we can only afford to make this a gradual transition if we act now, before it is too late.

BUSINESSES ARE LEADING THE CHANGE

Businesses are already changing to stay fit for the future, by calling on governments to implement carbon pricing and by applying internal carbon and water pricing. Over the last few years, the 'circular economy' has gained traction: moving away from today's linear 'take-make-waste' industrial model to a carbon-neutral and regenerative model in which products are 'made to be made again'. In this way, finite resources and materials are not wasted, and businesses can add value over and over again by

applying business models such as repair and maintenance services, recycling, remanufacturing and refurbishment. Materials use and carbon emissions are closely linked. An upcoming OECD report states that more than half of all greenhouse gas emissions are related to materials management activities. Several governments (including China, Germany and France) as well as the EU have adopted the circular economy as a policy goal. Businesses – large and small, and in every sector – have started to explore innovative circular business opportunities.

TAX SYSTEMS TO SUPPORT THE CIRCULAR ECONOMY

Circular business models tend to require innovation, customisation, more personal attention and customer service than the 'business-as-usual' selling of mass-produced goods. When pollution and primary resources are tax-free (or even subsidised) and labour costs are high, businesses face a barrier to scaling up their circular activities. As most studies on the circular economy conclude, reducing labour taxes and increasing green taxes will be key to achieving the circular ambitions set by governments and businesses. The risks and opportunities of such a shift are not evenly distributed, but in the face of the megatrends, 'business as usual' is no longer an option. Fortunately, innovation and adaptation are in the DNA of business and every sector has opportunities to develop business models that are fit for the future.

The risks threatening our future are huge, but so are potential opportunities if we respond effectively. According to a report by the BSDC, achieving the Sustainable Development Goals opens up at least \$12 trillion of market opportunities. Considering our fast-changing world, tax systems will need to adapt too. Today, it is more rational to tax pollution and resource use than it is to tax labour. By rethinking the design of our tax systems in a holistic way, we can make taxes a force for good: a tool supporting the ambitions of a global inclusive economy that is fit for the future.



Introduction

SURVIVAL OF THE FITTEST

When Charles Darwin put forward the theory of 'the survival of the fittest', by 'fittest' he meant those 'most fit-for-purpose'. It's not the biggest, strongest or fastest that will survive, but the ones that adapt in time to changing circumstances.¹ What can we learn from this, and does it also apply to the way we structure our tax systems? In history, tax systems have always evolved, shifting the tax base along the lines of geographic, political and technological developments. We have moved from taxes on sheep, brides, beards, salt and glass windows, to more modern-day taxes such as fossil fuel excise duties and progressive personal income taxes; taxes on the use of online user data are around the corner.² The perception of what is considered a rational tax base changes over time.

ALIGNING TAX POLICY WITH THE CHALLENGES OF OUR TIME

The foundations of modern tax systems were laid down in the era of the industrial revolution: before globalisation and mass consumption, before the emergence of climate disruption and water supply risks, and before digitisation, automation and robotisation. Today, goods, services and information, as well as materials and pollution, move across national boundaries in a way that could never have been envisaged at that time (Piper 2014).

Keeping the importance of adaptability in mind, this should be a good time to rethink the role of tax in society and update and redirect financial incentives in accordance with fast-changing circumstances. The question is: how to do this and where to start? What are the things we should be taxing in this day and age?

FOCUS ON LABOUR TAX AND GREEN TAXES

In recent years, corporate income taxes have been in the public eye. This discussion paper will focus on two other types of taxes that are less publicised but directly related to today's socio-economic challenges: labour taxes (including social contributions) and environmental (or 'green') taxes. In Western tax systems, public revenue is largely raised on employment. In the 28 countries of the European Union, for example, half of government budgets are based on personal income tax, payroll tax and social contributions – basically the amounts employees and employers pay on salaries. Just 6% of tax revenues in the EU are 'green' taxes and these are almost exclusively focused on energy and mobility. Virtually no tax revenues are based on the use of natural resources (including water, metals and minerals) and pollution (such as CO₂ and other emissions to air, water and soil) (weighted averages, European Commission 2018d).

Similar structures can be found in other regions around the world, as we will explore further in this paper.³

THE STRUCTURE OF THIS PAPER

The first step in this analysis is to explore some of the main socio-economic megatrends and the need for inclusive growth. Chapter 2 looks at the role of labour taxes in achieving inclusive growth. Chapter 3 focuses on environmental megatrends and the need for sustainable development. Chapter 4 will look at the limited use of green taxes in current tax systems, the negative impacts of global fossil-fuel subsidies as well as current inconsistencies in carbon pricing. Chapter 5 examines how the tax burden could shift from employment to natural resource use and pollution. Chapter 6 provides some basic principles for implementation. Chapter 7 illustrates how the role of business is changing and how corporations can prepare for what might be the next evolutionary step in fiscal policy. The final step in this analysis is a call for action directed at governments and the private sector.

In order to explore what we should be taxing nowadays, first let's take a look at some of the main socio-economic challenges.

1. Socio-economic megatrends: the need for inclusive growth



UN SUSTAINABLE DEVELOPMENT GOALS

In 2015, 193 countries of the United Nations (UN) General Assembly adopted the *2030 Agenda for Sustainable Development*. The agenda sets out 17 ambitious Sustainable Development Goals (the SDGs or Global Goals) that integrate social issues (such as fighting poverty and improving global health) and specific environmental issues (such as combating climate change) (UN DESA n.d.). Governments, corporations and organisations are now exploring how to make an impact and how to measure progress towards achieving the SDGs. According to a report by the BSDC, achieving the SDGs will open up \$12 trillion of business opportunities in food and agriculture, cities, energy and

materials, and health and well-being (BSDC 2017). As humanity's 'to do list', the SDGs will dominate the global agenda for the next decades.

UNEMPLOYMENT

Global Goal 8 aims at achieving 'full and productive employment and decent work for all, and equal pay for work of equal value' by 2030. The achievement of this goal is not yet in sight. More than 190m people are unemployed in the world today (ILO 2018b). The global youth unemployment rate for 2017 was 13% and it was highest in the Arab States, at 30%. An estimated 71 million people under 25 years of age are unemployed globally (ILO 2017).

VULNERABLE FORMS OF EMPLOYMENT

Even those with a job may still be in a precarious position. Young people, for example, are twice as likely as adults to be in temporary employment (ILO 2017). The ILO estimates almost 1.4bn workers to be in 'vulnerable employment', including, for example, those who are self-employed. They have a lower likelihood of having formal work arrangements, and are therefore more likely to lack elements associated with decent employment, such as adequate social security (ILO 2018a). Informal workers without a legal contract are more likely to earn lower wages and to have little or no job security (ILO 2018b). Vulnerable employment affects three out of four workers in developing countries (ILO 2018c).

FIGURE 1.1: The 17 Sustainable Development Goals



Source: UN



Vulnerable employment affects **3 out of 4** workers in developing countries.

Informal or precarious work could become more widespread owing to the rise of the gig economy and the platform economy.⁴

UNDEREMPLOYMENT

Even in countries where unemployment seems relatively low, the underutilised labour potential can be significant, as many groups are not represented in unemployment statistics. The official US unemployment rate, for example, stood at 3.9% as of July 2018, while the *U-6 underemployment rate* (which includes discouraged workers and those involuntarily working part-time) was almost twice as high at 7.5% (Bureau of Labor Statistics 2018). Additional statistics such as these provide useful insights in labour market performance.

GENERATIONAL EFFECTS

Unemployment and vulnerable employment do not only affect today's economy: they could have generational impacts for decades to come. The lack of a stable income in a household could restrict social and financial prospects of the next generation, further widening the gap of inequality in the future.

GREYING POPULATIONS

Almost every country in the world is facing an increasingly ageing population. According to the United Nations, this is 'poised to become one of the most significant social transformations of the twenty-first century, with implications for nearly all sectors of society.' The number of people aged 60 years or over is expected to more than double by 2050 (UN n.d.). Projections by the IMF indicate

that as populations age, public sector transfers for pensions, health care and long-term care will be 'unsustainable unless taxes are raised or benefits reduced or both' (Lee and Mason 2017). In OECD countries,⁵ public expenditure on health and pensions already accounts for one-third to one-half of primary expenditure while 12.5% of people aged 65 and over in OECD countries live in relative income poverty (OECD 2017a). Since 2014, retirement contributions in China have no longer been sufficient to fund pensions, leaving a growing gap to be filled by contributions from the government budget. This is indicative of the trends in demographics and their impacts on national budgets (Daco 2018).

In future, we can expect that more and more elderly citizens will find they cannot afford not to work.⁶

INCLUSIVE GROWTH FOR A GROWING POPULATION

With roughly 83m people being added to the world's population every year, the upward trend in population size is expected to continue, even if fertility levels continue to decline (UN DESA 2017). One of the most important tasks is to accommodate for the full capacity of human potential and provide meaningful employment to all. Enabling people to be productive for a longer period of time and enable life-long learning will be key, as will be further discussed in Chapter 2.

The next chapter will focus on labour taxes in different regions, the impacts of labour taxes on labour markets, and set out for an argument to align tax policy more closely with the need for inclusive growth.

2. Labour taxes: a barrier for inclusive growth



LABOUR TAXES IN OECD COUNTRIES ARE SIGNIFICANT

In 2015, the 35 OECD member countries collected \$14,377bn in taxes, 52.1% of which was based on labour. In all OECD countries except Chile, labour taxes provided the largest share of tax revenue; more than VAT and capital. In 20 OECD countries, labour tax accounted for more than half of total tax revenue (see Figure 2.1).⁷

LABOUR TAX WEDGE

The *labour tax wedge* is a measure of the tax burden on employment incomes. It is the difference between the employer's cost of hiring a worker⁹ and the worker's net disposable income. Between 2009 and 2016, the average labour tax wedge across the OECD increased by 0.7 percentage points, to 36%.¹⁰ This means that, on average, of every dollar an employer pays in labour costs, only \$0.64 ends up in the pocket of the employee.

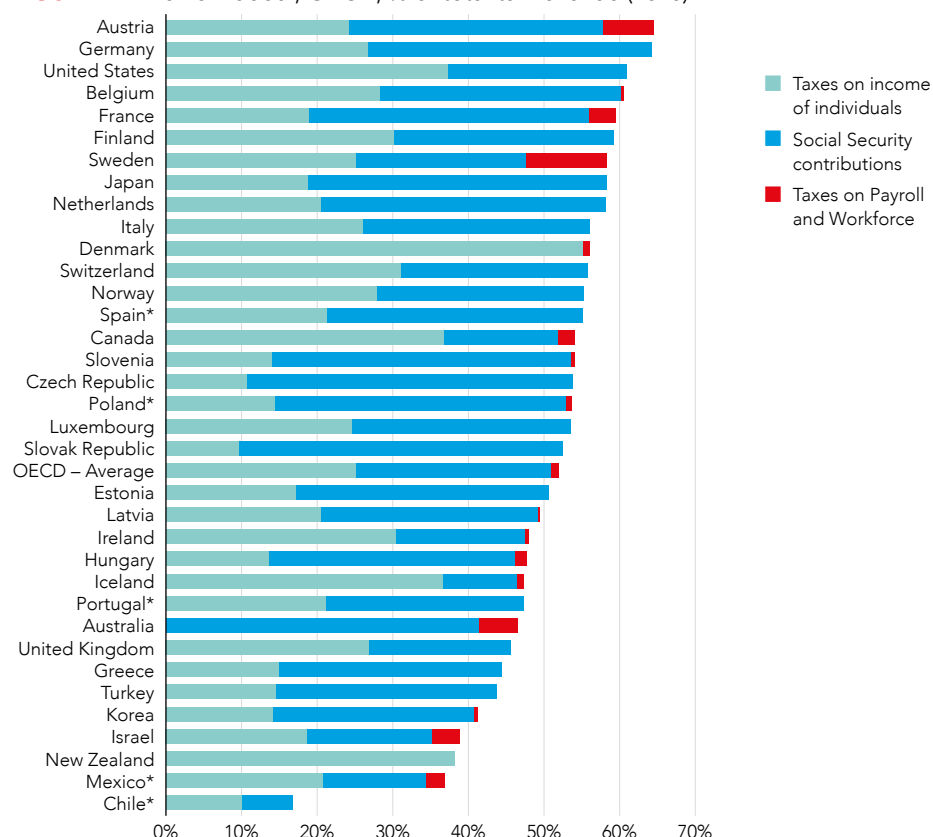
LABOUR VERSUS GREEN TAX REVENUES ACROSS CONTINENTS

In general, while OECD countries rely more on labour taxes, African, Asian, Latin American and Caribbean countries may rely more on taxes on goods and services (OECD 2018b). Still, labour tax revenues provide significant shares of revenues in these regions, and substantially more than green taxes (this will be discussed more extensively in Chapter 4). In 2014,¹¹ in Brazil, labour

taxes provided 36% of total tax revenues (OECD 2018b), whereas green taxes raised 2% of revenues (OECD 2018f). In Costa Rica this ratio was 40:10, in Mexico 39:1. Such differences in proportions can also be found in Africa, with South Africa raising 35% on labour

and 6% on green taxes (OECD 2018b; OECD 2018f). In Rwanda the ratio was 29:7 and in Cameroon 15:5. For Asia, the OECD database includes full data sets for Japan (59:5), Korea (41:11), the Philippines (26:1) and Malaysia (15:1) (OECD 2018b; OECD 2018f).¹²

FIGURE 2.1: Tax on labour, OECD, % of total tax revenue (2015)⁸



For employers, high payroll costs can be an incentive to minimise the number of employees. Cost considerations can also drive the replacement of human roles with automation and artificial intelligence.

A LINK BETWEEN LABOUR TAXES AND EMPLOYMENT

High taxes on labour income can hamper both job creation and work incentives (Perret 2018). Research has demonstrated that a lower tax burden on labour creates employment opportunities.¹³ The European Commission stated in 1993:

‘Studies have been carried out in several countries with very high levels of security contributions. These studies show that a reduction of 30 to 40% in social security contributions for low-paid workers would increase employment by 2%’.

(European Commission 1993)

The influence of taxation on employment and unemployment was also found to be significant in a sample of 21 OECD countries. Between 1983 and 2003:

‘a 10 percentage points reduction of the tax wedge in an average OECD country would reduce equilibrium unemployment by 2.8 percentage points and increase the employment rate by a larger 3.7 percentage points (due to the positive impact on participation)’.

(Quoted in Dolenc and Laporšek 2010)

Other researchers found even stronger correlations. Over the years, institutions such as the World Bank (World Bank, Bogetic et al. 2015; World Bank 2018), the OECD (OECD 2018d; OECD, World Bank and ILO 2015; OECD 2011c), the IMF (2014; 2015a), the European Commission (2013a; 2017a), the Eurogroup (2014)¹⁴ and the European Council (2011) have called for lower labour taxes to reduce unemployment.

According to the OECD, low-income workers, single parents, second earners and older workers are especially responsive to changes in labour income taxation. The retirement decision of older workers is also highly responsive to tax incentives (OECD 2011a). In general, both the decision to enter the labour force and the hours worked are affected by labour taxes (Bocconi University 2011).

TAXES AFFECT EMPLOYMENT DECISIONS

For employers, high payroll costs can be an incentive to minimise the number of employees. Employers generally resort to a number of options to minimise labour input, including:

- reducing service levels provided to customers (eg in hotels, Singh 2014)
- replacing manual service with machines (eg self-checkout lanes in supermarkets, Wohl 2012)¹⁵
- shifting to mass production rather than bespoke, custom-made products (eg hand-made shoes vs mass produced shoes, Segran 2017)
- hiring short-term, informal workers rather than workers on a permanent contract (hiring interns, Croxford 2018; He 2018) or operating in the gig-economy, Maxim and Muro 2018)
- understaffing (putting pressure on workers to produce more in less time, Ghosh 2018)
- outsourcing to lower-income countries (Heath 2015).

Cost considerations can also drive the replacement of human roles with automation and artificial intelligence. The effects of new technologies on the labour market are currently the subjects of intense debate. The overall agreement among studies, whether predicting a net loss or increase of job opportunities, seems to be that there will be a huge shift in the kinds of skill that are demanded. This trend makes it even more important to foster inclusive economies in which labour demand is sufficient to enable people whose tasks or jobs are taken over by machines to find new roles.

In general, a lower tax burden on labour should benefit all sectors that rely heavily on human resources, from innovative businesses undertaking research and development, to hospitals and universities.

WEIGHING DOWN INVESTMENTS IN HUMAN CAPITAL

Professional education needs to be revolutionised to adapt to the skills required in the economy of the future. The growing importance of continuous learning throughout our professional life means that universities and learning providers need to recruit people with a different set of expertise to develop new learning models, but extra staff time and resources are also needed from employers – in both the private and public sectors – to enable this continuous learning to take place (ACCA 2018a). In general, a lower tax burden on labour should benefit all sectors that rely heavily on human resources, from innovative businesses undertaking research and development,¹⁶ to hospitals (LaPointe 2018; Becker's Hospital Review 2013) and universities (Desrochers and Kirshstein 2014).

LABOUR TAX AND INFORMAL WORK

Labour taxes can cause a significant difference in costs between hiring formal and informal workers, which in turn can lead to more informal work. In the case of Costa Rica, for example, according to the OECD:

‘The total social insurance payroll tax rate is ...well above the OECD average... The large portion at the charge of employers (26.33%) drives Costa Rica's non-wage labour costs ...almost 9 percentage points above the OECD average. Such a high rate pushes up the cost of formal employment and the incentives to hire or work informally’.
(OECD 2017b)

When employers hire workers informally or in the gig economy, this limits the workers' position and skill development as well as social benefits. While not all informal workers are poor, poverty is both a cause and a consequence of informality (ILO 2018d). As the previous UN Secretary-General Ban Ki-moon has stated:

‘Experience shows that economic growth, on its own, is not sufficient. We must do more to empower individuals through decent work, support people through social protection, and ensure the voices of the poor and marginalized are heard.’
(UN Secretary-General 2014)

The tax burden on labour has an impact on employers' decision-making process when choosing business models and hiring and firing employees. Avoiding a high tax burden on labour while boosting social protection will be key to fostering inclusive economies. A key option for financing such strategy is to increase the tax burden on pollution and resource use, as will be explored in the next chapter.



3. Environmental megatrends: the need for sustainable growth

Many of the greatest challenges societies and economies are facing today relate to environmental megatrends. This chapter provides a selection.

CLIMATE DISRUPTION AND POLLUTION

Climate disruption has become an international matter of security, linked to droughts, floods, wildfires, conflicts and refugees (UN 2018). According to the latest IPCC report, global carbon emissions must start to reduce well within 12 years if we are to prevent large-scale natural and human risks from becoming irreversible reality (IPCC 2018a). Pollution is another major threat. In 2015 alone, exposure to contaminated water, air and soil pollution caused an estimated 9m premature deaths globally (Lancet et al. 2017). Air pollution was the biggest 'killer', with outdoor air pollution, largely from vehicles and industry, causing 4.5m deaths (Carrington 2017). According to the World Health Organization (WHO), 91% of the world's population live in places where air quality exceeds the WHO's guideline limits (WHO 2018).

GLOBAL IMPACT OF CONSUMPTION PATTERNS

Additional megatrends concern various aspects of resource-use and consumption patterns. Already, for example, 1.2bn people live in areas of water scarcity, and by 2050 water scarcity is likely to affect 4bn people (UN Water n.d.). One-third of all food produced for human consumption is lost or wasted globally – while at the same time, almost one billion people go hungry (FAO 2018). A truckload of plastic waste is dumped in the oceans every minute, which means that in a few decades there will be more plastics than fish in the oceans (WEF et al. 2016). Meanwhile, metal and mineral mining is leaving a trail of (often toxic) waste, poor working conditions and conflict (Carvalho 2017).

Even though these issues affect regions in different ways, no country can escape from their impacts as economies are intricately connected: product supply chains cross and re-cross national borders, and our climate and ecosystems respond to a complex web of interrelated factors. Air pollution does not stop at borders and plastics discarded in one country wash up on the shores of others. Research suggests that the future of the Greenland Ice Sheet could be linked in a web of self-reinforcing

chain reactions with what happens in other regions, including changes to the Gulf Stream ocean current, heat accumulation in the Southern Ocean, and ice loss from the East Antarctic (Steffen et al. 2018).

THE POLLUTER DOESN'T PAY

The costs of the environmental megatrends are becoming ever clearer. The Lancet Commission estimates the global welfare losses from pollution at \$4.6 trillion a year, or 6.2% of global economic output (Lancet et al. 2017). The long-term negative impacts on the global economy caused by the CO₂ emissions in 2017 alone were \$16 trillion (Ricke et al. 2018). Such costs are 'externalised', meaning that they are passed on to society, individuals and future generations, rather than absorbed by the polluter (Helbling 2010). The notion of putting a price on externalities has been around since Arthur Pigou introduced the concept in 1920 (Pigou 1920). In recent years, many studies have quantified external costs (or 'negative externalities'). A few examples are provided in Box 3.1. A particularly large body of research has emerged on the external costs of carbon and the pricing levels needed to achieve the goals of the Paris Climate Agreement, as will be discussed in Chapter 4.

Considering that we live in an era of climate change, water scarcity and geopolitical tensions over fuels and materials, it would be wise to use natural resources prudently.

THE BENEFITS OF SUSTAINABILITY ACTION

In 2018 the Global Commission on the Economy and Climate has examined how the international community could achieve its development goals within the constraints imposed by climate change. The Commission found that bold action, including carbon pricing, could actually yield a direct economic gain of \$26 trillion through to 2030 compared with business-as-usual (Global Commission on the Economy and Climate 2018). Another study estimates that restoring the oceans could result in being able to feed a billion people a healthy seafood meal each day (Oceana 2017).

Considering that we live in an era of climate change, water scarcity and geopolitical tensions over fuels and materials, it would be wise to use natural resources prudently. Our tax systems, however, are currently not aligned with the goal of sustainability, as the use of natural resources tends to be relatively tax-free, or even subsidised, as will be examined next.



Box 3.1: External costs studies

External costs of air pollution

In the European Union, air pollution caused over 400,000 premature deaths in 2010. Health-related external costs range between €330bn and €940bn per year depending on the valuation methodology. Direct economic damages include €15bn from lost workdays and €4bn from healthcare costs because of hospitalisation (European Commission 2013b).

Productivity losses in the global labour force due to death and disability from air pollution topped \$161bn (€126bn) in 2010, including \$89bn (€70bn) in low and middle-income countries (IBRD/World Bank 2015).

External costs of climate change

1.5°C global warming will inflict \$54 trillion in damage to the global economy (the 'mean net present value of the costs'). 2°C warming will cost the global economy \$69 trillion, and warming the planet by 3.7°C will cost \$551 trillion in damage (Warren 2018).¹⁷

By 2060, climate change will curb global GDP by 1.5% on average, with the negative GDP impact in South and South-East Asia being more than 5% (OECD 2014a).

By 2060, the cumulative 'lost' GDP due to climate change could be 0.7%–2.5% of GDP, or \$44trillion (€ 41 trillion) (Citi GPS 2015).

External costs of food production

Agriculture: The environmental impacts of industrialised farming are \$3 trillion (€2.4 trillion) per year (FAO 2015).¹⁸

Livestock farming costs the environment \$1.81 trillion per year (€1.4 trillion), equivalent to 134% of its production value.

For example, the conversion of natural ecosystems to pastureland for beef production in Brazil results in a natural capital cost of over \$473 million.

Crop production costs \$1.15 trillion (€0.9 trillion) per year, equivalent to 170% of its production value.

Food waste: The economic, environmental and social costs of food wastage are \$2.6 trillion annually (FAO 2014).

Contaminated farmland: The health risk of contaminated farmland in China was up to 9 trillion Chinese yuan, or nearly 1.72 trillion Canadian dollars, during the five years between 2016 and 2020 (IISD 2018).

External costs of business activities

Global: The value of the 'global top 100 externalities' of business is estimated at \$4.7 trillion (€3.8 trillion). The majority of these costs are from greenhouse gas emissions (38%) followed by water use (25%); land use (24%); air pollution (7%), land and water pollution (5%) and waste (1%) (Trucost, TEEB 2013).

Road Transport: In 2010, in OECD countries plus China and India, road transport was responsible for approximately \$1 trillion (€0.7 trillion) in health costs (OECD 2014b).

Coal power plants: Emissions from coal power plants in Europe cause more than 18,200 premature deaths, about 8,500 new cases of chronic bronchitis, and over 4m lost working days each year. The economic costs of the health impacts from coal combustion in Europe are estimated at up to €42.8bn per year (Huscher et al. 2013).

4. Resource-use and pollution hardly taxed and even subsidised

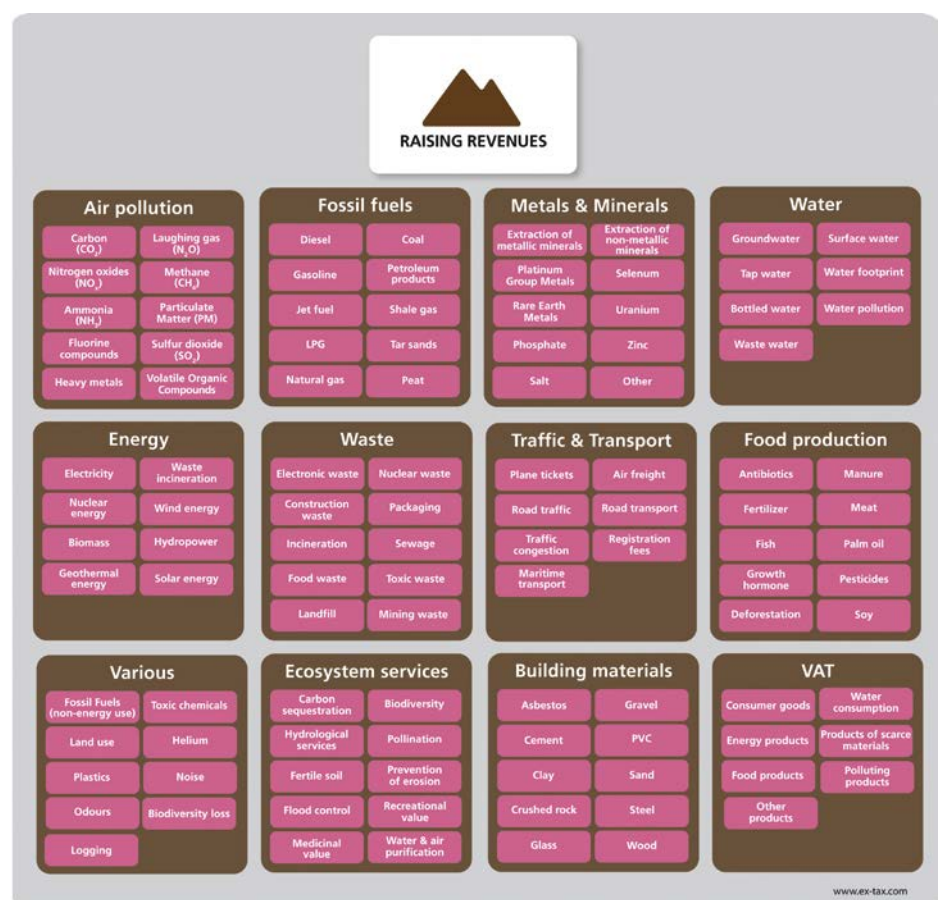
TAXES ON RESOURCE USE AND POLLUTION

The European Commission defines environmental taxes as taxes on energy, transport, pollution and resource extraction (European Commission 2013c). The 'Policy Toolkit' developed by The Ex'tax Project (see Figure 4.1 and Figure 5.2) provides an overview of more than a hundred 'green' tax base options available to governments, including air pollution (such as carbon emissions), energy, food production inputs, fossil fuels, metals and minerals, traffic, waste, and water.¹⁹ Each category holds several sub-categories. Within the waste category, for example, are electronic waste, sewage, nuclear waste and other types of waste. Throughout this paper, 'green taxes' will refer to all tax measures that put a price on the use of a natural resource.²⁰

VARIETY OF MEASURES – VARIETY OF IMPACTS

It's important to note that, considering the wide variety of green tax bases, the goals and impacts of green taxes also vary considerably. Green taxes can be very effective in changing behaviour and averting environmental damage. The UK Landfill Tax, for example, has been instrumental in reducing the amount of waste dumped in the ground by 44% since 2000 (HM Government 2018). When Stockholm began taxing vehicles to reduce traffic in the city centre, traffic pollutants dropped by up to 20%, which decreased the incidence of childhood asthma by 40% (Simeonova et al. 2018). Other green taxes

FIGURE 4.1: Ex'tax Policy Toolkit: Green tax revenue-raising options



Source: The Ex'tax Project

Unlike other regulation, green taxes provide the opportunity for recycling the revenues to compensate for any welfare loss that may occur.

are less effective in changing behaviour but generate long-term revenues. Since the 1960s, for example, the Dutch government has raised almost €300bn (CBS 2017; 2018) in revenues for the national coffers from the exploitation of oil and gas fields, which has enabled investments in social security and infrastructure (CBS 2015). In this case, the 'extraction tax' provided a steady income stream for decades.²¹

GREEN TAXES ARE GROWTH-FRIENDLY

Green taxes are generally considered growth-friendly, as they are less distortive to the economy than taxes on labour and income (Barrios et al. 2013; European Commission 2013d; 2014a; 2015a). The administrative costs and transaction costs of green taxes are lower than other taxes (notably income taxes) (Eunomia and IEEP 2014). Unlike emissions trading systems²² or other regulation, green taxes provide more opportunity for recycling the revenues through reducing other taxes to compensate in part, or even overcompensate, for any welfare loss that may occur.²³ If effectively implemented, cap-and-trade systems can provide greater certainty on environmental outcomes but green taxes avoid fluctuations in price and provide consumers and businesses with greater certainty on investment decisions (Fankhauser et al. 2011). Green taxes are also more economically efficient than direct regulation. MIT's *Global Change* programme, for example, found that

higher gas taxes are at least 6 to 14 times more cost-effective than stricter fuel-economy standards at reducing gasoline consumption (Karplus et al. 2013).

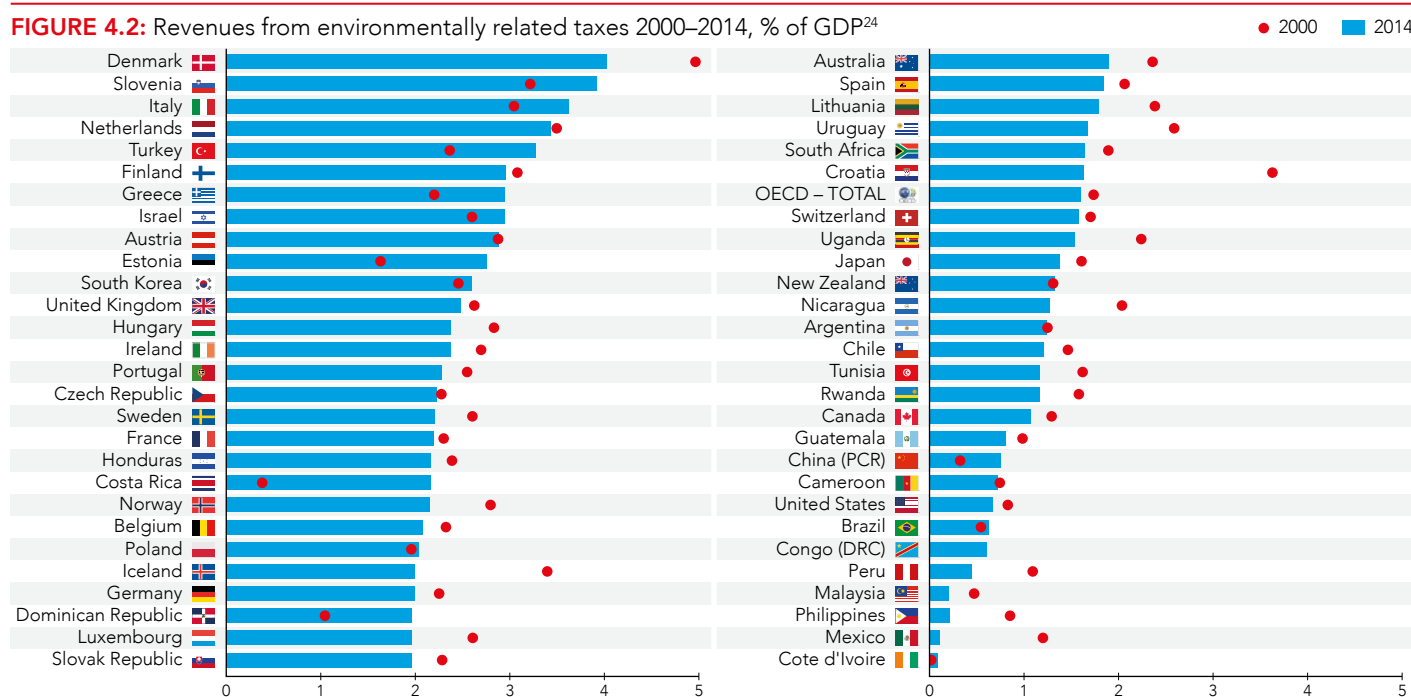
GREEN TAX USE IS LIMITED

In light of the megatrends mentioned in Chapter 3, it is rational to put a price on pollution and resource use, and international institutions support green taxes. Still, their use is limited. In 2014, green taxes raised 5.3% of total tax revenues in OECD countries (generating revenue equal to 1.6% of GDP in the OECD). In Canada, for example, environmental taxes raised 3.5% of total tax revenues, in the US this was 2.7%, and in Brazil 2%. Asian economies also show modest green-tax revenues: 3.8% of total tax revenues in China; 4.6% in Japan and 1.4% in the Philippines for example. In Africa, South Africa raised 6% of budget through green taxes, Rwanda 7.4%, and Cameroon 5%. One of the greatest shares of environmentally-related tax revenues in the OECD database was found in Kazakhstan (15% of total revenues), but this represented less than 3.2% of GDP (OECD Compare your Country n.d.).

GREEN TAXES ON A DECLINING TREND

Over the 2000–2014 period, environmental tax as a % of GDP declined in 52 out of 79 countries in the OECD database (Figure 4.2 provides a selection).

FIGURE 4.2: Revenues from environmentally related taxes 2000–2014, % of GDP²⁴



In light of the Paris Climate Agreement, the idea of abolishing fossil fuel subsidies and, additionally, putting a price on carbon emissions, is attracting increasing attention.

SUPPORT MEASURES FOR FOSSIL FUELS

Besides levying relatively low tax levels on pollution, almost all nations apply direct and indirect subsidies for environmentally damaging activities (Shirai and Adam 2017). Tax credits – defined as a subsidy by the WTO (2006) – are a key route of support for the fossil fuel industry (Carrington and Davies 2015). Support measures are typically provided for fossil fuel consumption and production through lower rates, exemptions, or rebates of VAT and excise taxes (OECD 2015a). The OECD has identified more than 1,000 individual government policies that support fossil fuel production and consumption (OECD 2018g). In 2012 all those fossil fuel support measures were worth \$617bn. By 2015 they had gone down, but still amounted to \$373bn.²⁵ The majority of these measures are tax expenditures (OECD 2018h). The German government, for example, provides an Energy Tax Exemption for kerosene used in domestic flights, which reduced tax revenues by €570m in 2016 (OECD 2018i).

NEGATIVE IMPACTS OF FOSSIL FUEL SUBSIDIES

There can be good reasons for governments to make energy more affordable, particularly for the poorest and most vulnerable groups, but according to the International Energy Agency (IEA):

‘Many subsidies are poorly targeted, disproportionately benefiting wealthier segments of the population that use much more of the subsidised fuel. In practice, the effect of most subsidies is to encourage consumers to waste energy, putting added pressure on energy systems and the environment, and often straining government budget.’
(Shirai and Adam, 2017)

And the OECD states:

‘Not only do fossil-fuel subsidies undermine global efforts to mitigate climate change, but they also aggravate local pollution problems, causing further damage to human health and the environment. They represent a considerable strain on public budgets as well, draining scarce fiscal resources that could be put to better use, such as strategic investment in the education, skills, and physical infrastructure that people value most in the 21st century. Last, fossil-fuel subsidies distort the costs and prices that inform the decisions of many producers, investors, and consumers, thereby perpetuating older technologies and energy-intensive modes of production’.
(OECD 2018j)

In 2009, leaders of the G20 economies committed to ‘phas[ing] out and rationaliz[ing] over the medium term inefficient fossil fuel subsidies’ (OECD 2018h). In light of the Paris Climate Agreement, the idea of abolishing fossil fuel subsidies and, additionally, putting a price on carbon emissions, is attracting increasing attention.

CARBON PRICING ON THE RISE BUT PRICES ARE LOW

The World Bank estimates that the existing carbon pricing schemes worldwide are worth \$82bn in 2018, which is a 58% increase on 2017. Still, the vast majority (80%) of all global greenhouse gas emissions (IBRD/World Bank and ECOFYS 2018) and 46% of carbon emissions are free of charge (OECD 2018k). About half of the emissions covered by carbon pricing mechanisms are priced at less than \$10 per tonne (IBRD/World Bank and ECOFYS 2018).

‘At the current pace of incremental annual growth in pricing emissions, carbon prices will only meet real costs to the climate in 2095’.
(OECD 2018k)

THE CARBON PRICING GAP

In the 1980s, Nobel Prize winner William Nordhaus first estimated the external cost of carbon emissions. Since then, an extensive body of literature has emerged on this subject (Havranek et al. 2015). Box 4.1 provides four different approaches to establishing a reasonable price for carbon emissions. By far the largest share of emissions is not priced at such levels. The OECD’s carbon pricing gap measures how far countries fall short of pricing emissions compared with levels needed for decarbonisation, applying a benchmark of €30 per tonne (OECD 2018l). In 2018, the OECD reported a carbon pricing gap of 76.5% across 42 countries surveyed (OECD 2018m). This means that:

‘Globally, emissions are priced 76.5% below even the lowest estimate of their cost to society’.
(OECD 2018n)

Worryingly, the OECD noted that:

‘At the current pace of incremental annual growth in pricing emissions, carbon prices will only meet real costs to the climate in 2095’.
(OECD 2018k)

INCONSISTENT CARBON PRICING

The OECD’s *Taxing Energy Use* report clearly illustrates the inconsistency of carbon pricing across sectors (see Figure 4.3) Based on physics, there is no difference between carbon dioxide emitted from an exhaust pipe, a residential heater or a factory chimney; the impacts and, therefore, the external costs per tonne of carbon are the same. Still, the effective tax rate ranges from €0 per tonne of carbon emitted by coal combustion to more than €90 per tonne of carbon emitted in diesel used in road transport.



Box 4.1: The cost of carbon emissions

Estimates of how much emitting a tonne of carbon should cost covers a wide range, depending on the applied methodology, goals and scope of the calculations as well as the discount rates applied. Four approaches are given below.

1. The social cost of carbon

The OECD applies a minimum social cost of carbon of €30 per tonne, and in 2018 has added a benchmark of €60 per tonne to their analyses to reflect the estimated cost of carbon in the future (OECD 2018o).²⁶

According to an EPA study, the social cost of carbon was \$61–\$116 per tonne in 2015, and would rise to \$104–\$235 by 2050. In this study the social cost of carbon:

‘includes, but is not limited to, changes in net agricultural productivity, human health, and property damages from increased flood risk. However, given current modeling and data limitations, it does not include all damages’.
(EPA 2017)

2. Country-level social cost of carbon

A 2018 country-level assessment of the current social cost of carbon considered both costs and benefits of carbon emissions, to arrive at a net cost per country. This study arrived at a **global median net social cost of \$417 per tonne of CO₂**. Countries that incur large fractions of the global cost consistently include India, China, Saudi Arabia and the US. Northern Europe, Canada and the Former Soviet Union have negative social cost

(so: net benefit) because their current temperatures are ‘below the economic optimum’. According to the authors, such differences do not necessarily dictate these countries’ decision making about climate action:

‘Some countries, such as northern Europe and Canada, are leaders on climate policy despite potentially negative SCCs [Social Costs of Carbon], whereas other countries with the highest SCCs, like the United States and India, lag behind. Clearly, a host of other strategic and ethical considerations factor into the international relations of climate change mitigation’.
(Ricke et al. 2018)

3. Optimal carbon price

Other estimates do not take into account the external damage to society, but the price range needed to achieve certain reduction targets (the ‘optimal carbon price in a cost-benefit analysis’ (IPCC 2018b). The High-level Commission on Carbon Pricing, for example, concluded that a **\$40–\$80 range in 2020**, rising to **\$50–\$100 by 2030**, would be consistent with the core objective of the Paris Agreement of keeping the average temperature rise below 2 degrees Celsius (CPLC 2017).

4. Mitigation cost

A fourth way to look at the price of carbon is to estimate the cost of *mitigating* (avoiding) one extra unit of emission. The IPCC (2018b) report applies this method and estimates that, on a two-degree pathway, avoiding a tonne of CO₂ emissions will cost **\$10–\$200 by 2030 and \$160–2,125 by 2100**.²⁷

Arguments for shifting the tax base away from labour and onto resource use have become stronger over the years, and the proposal has gained the support of many organisations.

All these differences in the way fossil fuel uses are taxed and subsidised create artificial distortions. Instead of driving down carbon emissions across the board, they push businesses and individuals towards actions that may cost less, but are more polluting (such as taking an aeroplane rather than a train, see Box 4.2).

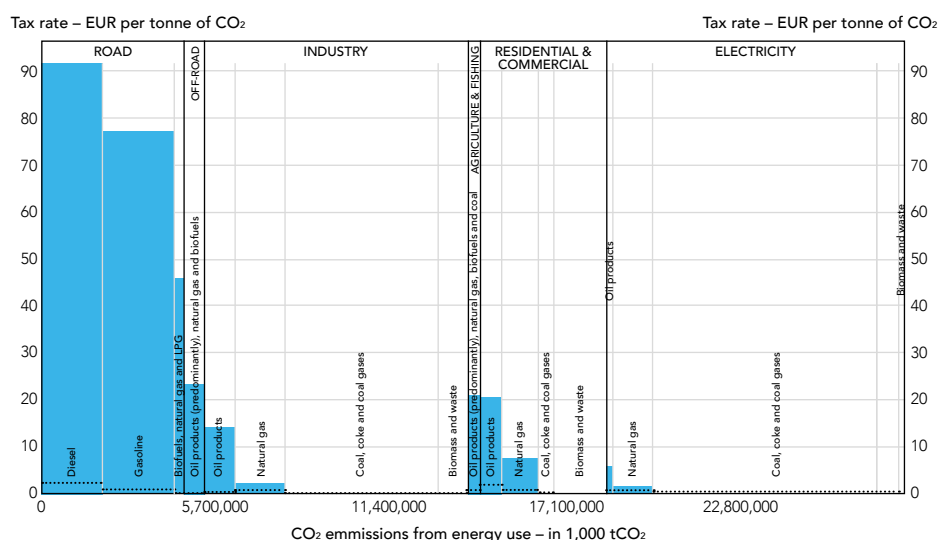
OTHER RESOURCE USE

Most research focuses on the pricing of carbon emissions rather than other types of pollution and resource use, but the European Commission (2012), the IMF

(Kochhar et al. 2015), the World Bank (2016), the United Nations (UN World Water Assessment Programme 2014), the OECD (2012 and 2013) and the European Environment Agency (EEA 2013) have called for a rise in water prices to help manage water as a finite resource.

Arguments for shifting the tax base away from labour and onto resource use have become stronger over the years, and the proposal has gained the support of many organisations. How would such a tax shift work in theory and has it already worked in practice?

FIGURE 4.3: Effective tax rates on energy use in the 42 OECD and G20 economies in EUR/tCO₂, 2015 (based on OECD 2018o)



Note: Tax rates are shown as at 1 April 2015. Carbon emissions from energy use were calculated from data in the *Extended World Energy Balances* (IEA, 2016b)



Box 4.2: Inconsistent taxes distort the level playing field in transport

Aviation, coach and rail treated differently

In the European Union, different modes of transport are treated differently. International aviation is exempt from VAT, both on its inputs (eg on fuel or aircraft) and on its revenues (eg on tickets). And although the minimum tax rate for jet fuel in the EU is €0.33 per litre (European Commission 2016b), aircraft fuel is currently mandatorily exempt from excise duty (European Commission 2018c).²⁸ Coach and rail operators, on the other hand, do pay fuel tax, and their tickets can be subject to VAT. In the case of electrified rail, electricity is subject to the European ETS and full auctioning of allowances. Such differences in taxation distort the market, create a hostile regulatory environment for investment in lower-carbon transport alternatives and discourage investment in these sectors (Transport and Environment 2018), even though they are more environmentally friendly (AirportWatch 2018).²⁹

Countries introducing a passenger duty

As a consequence of this legal barrier to taxing fuel directly and internalising aviation's environmental costs, a number of European countries have been creative in levying such taxes upon passengers departing on international flights from their airports (Piera 2015). The UK has levied air passenger duty since the early 1990s, raising GBP 3.150m in 2016 (Statista 2018). Germany introduced a passenger charge in 2011, and €1.1bn of aviation tax was payable in 2017 for roughly 90m air passengers (Destatis Statistisches Bundesamt 2018). More recently, Sweden and Norway have introduced a passenger charge as well (Skatteverket 2018; Norwegian Tax Administration 2018).

5. How to shift from labour to green taxes



A THREE-STEP METHOD

While changing tax systems is difficult, the basic principle is simple: 'tax less what you want more of' (see Figure 5.1). Three steps should be taken.

Step 1: Put a price on pollution and natural resource use

Put a price on pollution and the use of natural resources in general, such as fossil fuels, waste, water and the extraction of metal ores. Governments have more than a hundred green tax bases at their disposal, ranging from carbon emissions to waste streams (see Figure 4.1 for an overview). Countries can start with the low-hanging fruit; options that suit national circumstances best. In light of the Paris Climate Agreement, abolishing fossil fuel subsidies and instituting effective carbon pricing are the first likely candidates.

Step 2: Use revenues to lower the tax burden on labour and improve social protection

The revenues of Step 1 are used to lower personal income tax, social contributions (both for employees and employers) and payroll taxes. Careful design is required to make sure that the needs of vulnerable groups are addressed through increased social protection or income support (we will discuss this in more detail in the 'Discriminatory effects' section below).³⁰

Step 3: Monitor and adjust

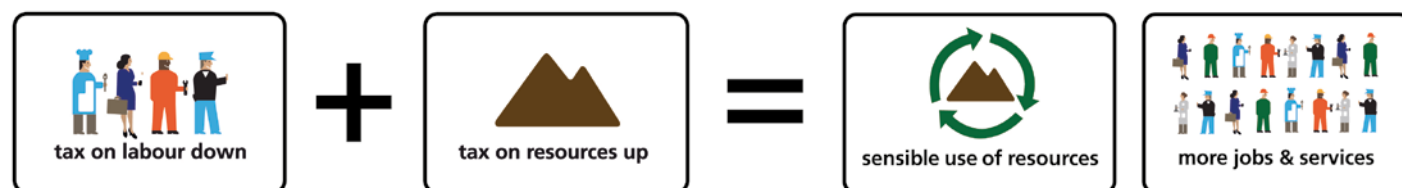
As in the current system, any reform needs to be monitored and adjusted. As a tax base erodes (much as labour tax revenue reduces when employment declines), tax bases and rates can be expanded or increased. In a fast-changing world, tax systems will need to adapt much faster than they have before.

As theory suggests and practice has proved, shifting taxes from labour to resource use can benefit the economy, the environment and job creation. A brief overview of results is given below.

MACRO-ECONOMIC MODELLING RESULTS

Over the last few decades a growing body of literature has emerged which has looked at the relationship between a tax shift and employment by modelling different policy scenarios. The UK Green Fiscal Commission, for example, modelled an ambitious tax shift in the UK, postulating a system based largely on energy taxes and some taxes on water and materials. It found that an increase of environmental tax revenues from 6% to 15% of total tax revenues allowed for income tax to be cut by 10% and National

FIGURE 5.1: The tax shift from labour to resource use



Source: The Ex'tax Project

According to the European Commission, a tax shift from labour to green taxes is 'a winning strategy'.

Insurance Contributions by around one-third. Other impacts were that carbon dioxide emissions fell by 16% in 2020, employment was up by around 1.5% (450,000 jobs) and the effect on GDP was negligible, 'as the negative effects of the energy price increase were almost completely offset by the positive effects of the increased employment and reduced labour taxes' (Ekins 2015).

This study fits in a long range of modelling work finding similar impacts. In 2005, a review looked at 186 model simulations taken from 61 separate studies. On average, 'all of the different groupings of studies predicted net job creation with significant reductions in CO₂ emissions' (Eunomia and IEEP 2014). In 2016, a working group presented a tax shift scenario for 27 EU Member States with positive results (see Box 5.1).

INCREASING SUPPORT FOR A TAX SHIFT

The OECD (2011b, 2013, 2015b, 2015c, 2018p), IMF (2012; 2015b; 2016; Heine et al. 2012; Lagarde 2012), World Bank (2015a), European Parliament (2012; 2013) and the ILO have all called for a change from labour-based taxation towards tax on resource-use and consumption (see Box 5.2). The ILO has stated, for example:

□ *'Taxing polluters generates revenues that can be leveraged to reduce other (distortionary) taxes, for example taxes on labour. These reductions can lead to higher labour demand and higher employment, while using less energy'. (ILO 2012)*

Business groups such as the WBCSD and the BSDC have also supported such a tax reform. According to the European Commission, a tax shift from labour to green taxes is 'a winning strategy'.



Box 5.1: 'New Era Europe' studied impact in 27 countries

In 2014, a working group consisting of fiscal experts of The Ex'tax Project, Deloitte, EY, KPMG Meijburg and PwC developed a budget-neutral scenario decreasing the tax burden on labour (for individuals and employers), and instead increasing VAT-rates and excise duties on fossil fuels, as well as taxation of electricity, water and carbon emissions, in the Netherlands (The Ex'tax Project et al. 2014). In 2016, the scenario was adapted for the European context and Cambridge Econometrics modelled the impacts in 27 EU Member States (The Ex'tax Project et al. 2016). The results show that switching taxes from labour to pollution and resource use could, compared with business as usual:

- add € 842bn in GDP
- enable 6.6m more people to be in employment
- cut carbon emissions by 8.2%, all by 2020, and
- save €27.7bn on the energy import bill over a five-year period.

UK-based company Trucost estimated the total value added of the scenario at over €1,100bn when taking into account the external benefits to society in terms of the health impacts of employment, reduced emissions and pollution levels and water savings (The Ex'tax Project et al. 2016).

OECD Secretary-General Angel Gurría stated in his Foreword to the resulting report:

□ *'The evidence-driven simulations presented in this report of The Ex'tax Project suggest that shifting taxes from labour to consumption and natural resources will result in more growth, more employment, and a smaller environmental footprint. We have enough evidence to support green tax reform and concrete policy action.'*

Angel Gurría, Secretary-General, OECD



Box 5.2: Support for shifting from labour to green taxes

- “‘Revenue neutral’ recycling, at a constant share of taxes on GDP, into lowering some existing taxes compensates [for] at least part of the propagation effect of higher energy costs...The substitution by carbon taxes of taxes that cause distortions on the economy can counteract the regressive effect of higher energy prices. For example, offsetting increased carbon prices with lower labour taxes can potentially decrease labour costs (without affecting salaries), enhance employment and reduce the attractiveness of informal economic activity).’
(IPCC 2018b)
- ‘Increased or more effective use of environmentally related taxes can drive growth-oriented reform by shifting the tax burden away from more distortive taxes, e.g. on corporate or personal income, and contribute to fiscal consolidation.’
(OECD 2015b)
- ‘For reducing carbon emissions (...), carbon pricing (through taxes or trading systems designed to behave like taxes) should be front and center. (...) Revenues could be used for lowering taxes on labor and capital that distort economic incentives, producing a counteracting economic benefit to the costs of higher energy prices’.
(IMF 2016)
- ‘Shifting taxes from labour to finite resources could level the playing field for more labour-intensive, but less resource-intensive practices. This creates jobs, while saving resources.’
(Ellen MacArthur Foundation et al. 2015)
- ‘It is important to consider how major tax bases—labor income and consumption—are likely to evolve over the long term. With the number of contributors to payroll taxes shrinking and non-labor income increasing as societies in the region age, the tax base will shift increasingly from labor income to consumption. As a result, to ensure sustainable financing for future large social obligations, it might be necessary to consider a gradual shift from payroll to consumption taxes (e.g., VAT and excises) and other underutilized instruments (e.g., property taxes). There are also employment and growth reasons why considering fiscally prudent reduction in labor taxes, particularly for low wage earners might be a good idea.’
(World Bank, Bogetic et al. 2015)
- ‘One of the biggest tax policy challenges in Europe is that governments tend to rely too much on labour taxes. But overdependence on labour taxes can be a disadvantage when they make it too expensive to employ people. Passing some of the taxes to other things, such as pollution, could help to accelerate employment and economic growth. Smart taxation is a winning strategy.’
(European Commission 2015b)
- ‘To move society towards sustainability – both socially and ecologically – would require a tax shift, lowering taxes on work and increasing taxes primarily on the consumption of non-renewable resources. Such a tax shift would accelerate the transition to a circular economy, which is low carbon and resource-efficient in nature.’
(Club of Rome, Wijkman and Skånberg 2016)
- ‘A high tax burden on labour is an impediment to the objective of supporting economic activity and increasing employment. ...tax wedge reductions need to be compensated ... through revenue-neutral tax shifts, away from labour to revenue sources that are less detrimental to growth such as consumption taxes, recurrent property taxes and/or environmental taxes.’
(Eurogroup 2014)
- ‘Tax strategies [should] shift towards incentivizing job creation and healthier products and discouraging negative external factors like pollution and environmental damage’.
(WBCSD 2010)
- ‘Business leaders must...work openly with regulators, business and civil society to shape fiscal and regulatory policies that create a level playing field more in line with the Global Goals. This could involve fiscal systems becoming more progressive through putting less tax on labour income and more on pollution and under-priced resources.’
(BSDC 2017)
- ‘taxing ‘bads’ (pollutants) rather than ‘goods’ (labor, capital) can allow for a less costly tax system Revenues can also be used to reduce the social charges imposed on labor costs. This may reduce unemployment rates and help increase real wages.’
(CPLC 2017)

The World Bank notes that it is possible to prevent taxes from increasing income-inequality if the revenues are used to benefit the poorest population.

THE TAX SHIFT IN PRACTICE

For a number of reasons, implementation of a tax shift is not easy. First, a long-term fiscal strategy is inhibited by the relatively short cycles in politics, which do not reward long-term planning. Secondly, nobody really likes to pay for something that was previously free of charge. Also, in the political arena, industries with an interest in keeping the status quo often have a stronger voice than other interest groups such as NGOs, healthcare organisations or small and medium-sized enterprises who may have an interest in a transition (OECD 2015c, 2017c).³¹ Another barrier is that tax reform works best if it's internationally coordinated, as shifting financial incentives will change trade patterns (as we will discuss below). Despite these barriers, tax shifts have been implemented in several countries, including the UK (in 1996),³² Germany (2007),³³ and Colombia (2012).³⁴

EU EXAMPLES

In the 1990s and early 2000s, seven European countries took steps to shift the tax burden from labour to energy and transportation: Sweden (initial year of the reforms: 1991), Denmark (1993), the Netherlands (1996), Finland (1997), Slovenia (1997), Germany (1999) and the UK (2001). In total, these reforms increased green tax revenues by more than €25bn annually, for a corresponding decrease in labour taxes. The impacts have been analysed and the associated reductions of carbon emissions have been documented in several studies. The burden for specific energy-intensive industries remained modest (1%-2% increase in energy costs) and the tax shifts generally had a positive effect on economic activity, depending on how the revenues from the green taxes were recycled. Also, the reforms caused employment in some of the countries to increase by as much as 0.5% (Andersen 2007).

IMPACTS IN BRITISH COLUMBIA

In 2008, the Canadian province of British Columbia began to tax fossil fuel users, ranging from utility companies to car drivers, in exchange for corporation and personal income tax cuts. Since then:

‘the economy has grown by an average of nearly 2 percent a year, despite a big national recession through 2009, outpacing the rest of Canada. The use of gasoline, coal and other carbon-based fuels has dropped 16 percent during the same period, reducing greenhouse gas pollution.’ (Scientific American 2015)

As of 1 April 2018, the carbon tax rate is CAN\$35 per metric ton. The tax rate will increase each year by CAN\$5 per tonne until it reaches CAN\$50 per tonne in 2021 (Government of British Columbia 2018). All revenues are recycled through tax cuts on both labour and capital. An additional tax credit for low-income households has made the carbon tax progressive (Fay et al.), which is an important characteristic of a fair tax shift, as will be discussed in more detail below.

DISCRIMINATORY EFFECTS

An often-heard worry is that environmental taxes could increase income inequality: they hit low-income households more, as they pay higher shares of their incomes towards energy-intensive goods. The World Bank notes, however, that it is possible to prevent taxes from increasing income-inequality if the revenues are used to benefit the poorest population (World Bank 2017a).

In practice, plenty of policy options are available to alleviate the impacts on specific households –compensating retired pensioners for the increase in heating costs, for example. Benefits can take the form of (means-tested) tax credits,

In 60 out of the 87 countries reviewed by the World Bank, a US\$30/tCO₂ domestic carbon tax would provide the resources to more than double current levels of social assistance.

exemptions, allowances or deductions. In some countries, cash transfers might ease the transition for the unemployed and those who live in poverty: the right solution will differ from one country to another. If desirable, green taxes can also be made more progressive by applying block tariffs (higher rates for higher use) or a tax-free threshold (eg leaving a certain amount of water or energy untaxed). We do not discuss possible compensating measures in detail in this report, but we would urge policymakers to consider these seriously, both in a domestic context and through sharing ideas and experiences with other countries.

Careful design and implementation can alleviate many, if not all of the concerns about discriminatory effects, as the case of British Columbia illustrates.

How might this work in low- and middle-income countries (LMICs) where labour taxes are limited?

TAX REFORM IN LOW- AND MIDDLE-INCOME COUNTRIES

It is widely believed that the governments of many LMICs should be aiming to increase the amounts they raise in tax revenue ('domestic resource mobilisation'). According to the World Bank, developing LMICs are likely to rely increasingly on their own fiscal resources to finance development objectives; between 50% and 80% of what is required for the SDGs would need to come from domestic resources (Niculescu 2017). Given the high unemployment rates, increasing taxes on labour in these countries is not necessarily the best option for increasing revenues sustainably. Taxing the use of natural resources might be a way of

'leapfrogging' tax systems to the SDG era and the development of social protection systems (see eg Moore and Prichard 2017). Energy subsidies in oil-exporting Eastern Mediterranean countries, for example, have tended to be higher than spending on health and education (Gupta 2018). And in 60 out of the 87 countries reviewed by the World Bank, a US\$30/tCO₂ domestic carbon tax would provide the resources to more than double current levels of social assistance in the country (Hallegatte et al. 2016).

As the High-level Commission on Carbon Prices concludes:

□ *'Taxing 'bads' (pollutants) rather than 'goods' (labor, capital) can allow for a less costly tax system... Revenues can also be used to reduce the social charges imposed on labor costs. This may reduce unemployment rates and help increase real wages. This would also serve to counteract the potentially regressive effects of higher carbon prices and help poor people deal with the higher price levels caused by carbon pricing. It also has positive distributional impacts because of the larger share of wages in the total income of poor households (higher-income households may have other sources of income—capital, interest, and rents). Moreover, mitigation options (eg, energy efficiency, renewables, and agricultural and forestry low-carbon practices) are generally more labor-intensive than economic activities based on fossil fuels. Therefore, recycling carbon tax revenues may generate a double dividend: fostering the transition toward decarbonization while simultaneously promoting economic growth and social development.'*
(CPLC 2017)

Taxes can help to ensure that pricing of products and services reflects their external costs, so that sustainable products will no longer be the more expensive option.

USE OF REVENUES OPTIONS

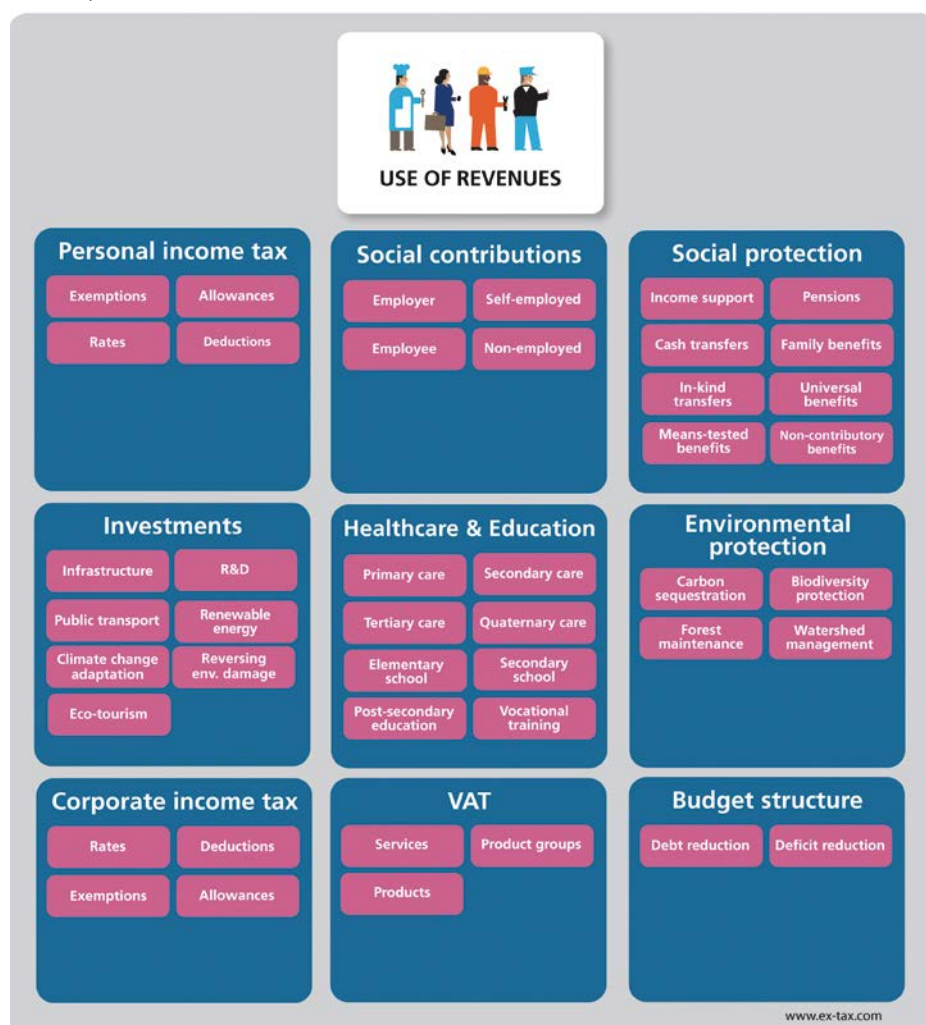
The Dutch think tank The Ex'tax Project has developed a 'Policy Toolkit' to illustrate the ways revenues could be used. Figure 5.2 (below) is part of a larger tool developed to assist in the scoping of policy roadmaps, and scenario development based on specific national or international goals. Figure 4.1 (page 17) provides the revenue-raising side while Figure 5.2 includes options for the use of revenues. A lower tax burden on labour can be achieved by putting revenues towards a reduction of personal income tax and social contributions. Depending on the desired outcomes at the bottom of the distribution, or addressing other societal needs, some of the revenues can be used to lower the tax burden for specific groups. Other options

are to use revenues for social protection (and pensions), investments, budget restructuring, education, healthcare or environmental protection. Each category holds several sub-categories. Within the Investments category, for example, are investments in infrastructure, research and development, climate adaptation, and others.³⁵

As illustrated above, there are many tools available for governments for tax reform. Taxes can help to ensure that pricing of products and services reflects their external costs (as we discussed in Chapter 3 above), so that sustainable products will no longer be the more expensive option.

The next chapter highlights a few principles to be observed in the implementation process.

FIGURE 5.2: Ex'tax Policy Toolkit – Use of revenues (labour tax reductions and other options)³⁶



Source: The Ex'tax Project



6. Principles for the tax ‘evolution’

In implementing tax reforms, some key principles must be observed: fairness, stability, consistency and transparency. Finally, countries should lead by example while seeking cooperation to enhance effectiveness. Below, each recommendation will be further explored.

I. THE TAX SYSTEM SHOULD BE FAIR

The tax system of the future must be fair, fostering safety for vulnerable groups in society. One key argument often levelled against green taxation is that it could have a disproportionate effect on the costs of living for lower-income households. A progressive tax shift that returns the tax revenues to these households – by cutting their income tax bill and social security contributions, and by increasing social assistance – addresses this concern. In general, tax systems are sophisticated structures with numerous technical options to facilitate a fair distribution between income groups.³⁷ Defining how exactly to compensate for effects on specific income groups and business sectors is a challenge, however, as compensating one group or sectors will come at the expense of another group or interest in society. Any package of measures can and will not be budget-neutral for each and every sector and for consumers with different consumption quota. The goal, however, is to reach a reasonable and fair effect among different income groups. As noted by Nobel laureate Professor Sir James Mirrlees:

‘It is important to consider all taxes (and transfer payments) together as a system. It is the redistributive impact of the system as a whole which needs to be measured and judged. ...Not all taxes need be progressive as long as the overall system is.’
(Mirrlees et al. 2011)

II. THE TAX SYSTEM SHOULD EVOLVE OVER TIME

A common argument against carbon taxes is that since the tax drives carbon emissions down, a successful carbon tax system erodes its own tax base, so that there is less and less to tax. Regular reviews on the effectiveness of the tax system, expanding the tax bases and increasing rates progressively through time can solve this challenge. An example of a so-called ‘tax escalator’ is the UK Landfill Tax, whose rate was set to rise by £8 per tonne each year during the period 2010–14. The government also announced a floor under the standard rate so that the rate would not fall below £80 per tonne from April 2014 to at least 2020 (HMRC 2016). In Sweden, a carbon tax was introduced in 1991 at a rate corresponding to SEK 250 (€26) per tonne

of CO₂ emitted, which has gradually been increased to SEK 1,150 (€120) in 2018 (prices converted at SEK 9.61 to the euro) (Government Offices of Sweden 2018). If carbon emissions are ultimately effectively reduced, governments may well shift focus to any other of the more than 100 tax base options in Figure 4.1 (a list which will undoubtedly expand over time as well).

III. THE TAX SYSTEM SHOULD PROVIDE STABILITY AND CONSISTENCY

Taxes can end up having a disproportionately negative effect on individuals and businesses when a new tax measure is introduced suddenly, without giving households and businesses enough time to plan ahead. ACCA has continually pushed governments to protect stability in tax as a key foundation of a sound tax system (Piper 2015), and nowhere is stability more important than in implementing the tax shift proposed here. It benefits individuals, businesses, the public coffers and the environment if governments increase tax rates gradually over time, and signpost the programme of yearly rate increases well in advance. ACCA also believes that taxes should be as simple and easy to comply with as possible (Piper 2013).

Tax payers should understand what they are paying, why they are paying it, and what the benefits of paying will be. Paying tax may never be fun, but engagement with a demonstrably fair tax policy will be more palatable.

IV. COMMUNICATION SHOULD BE OPEN AND TRANSPARENT

Shifting the balance of tax is a communications challenge because any change of the status quo can be perceived as threatening. Alongside this *status quo bias*, psychologists have also observed that fear of losses hold a more powerful sway over our decisions than the prospect of gains: the loss aversion bias (Kahneman et al. 1990). These human cognitive biases explain the uphill battle that forward-looking governments are facing as they introduce green taxes. But as 2018 Nobel Prize winner William Nordhaus states:

'On carbon taxes, people's views have changed from being very hostile, to conservative economists embracing this, to the I.P.C.C. saying, this is the approach. I have to be hopeful that, if we continue to work on this, the public will get there on the science, and make an exception to the toxicity of taxes. It will help if it's tied to something popular — if, as a result of the revenue from a carbon tax, you get a check in the mail, or it funds health care.'
(Quoted in Davenport 2018)

ACCA's *Twelve Tenets of Tax* argues that openness and transparency is key:

'Tax payers should understand what they are paying, why they are paying it, and what the benefits of paying will be. Paying tax may never be fun, but engagement with a demonstrably fair tax policy will be more palatable.'
(ACCA 2018b)

For a tax shift to be accepted by the public, it is imperative that governments clearly communicate the benefits for society, rather than just what it costs the individual (see eg Bramall and Stanley 2018).

V. COUNTRIES SHOULD LEAD BY EXAMPLE

One of the most frequently asked questions is: 'is it possible to implement a tax shift on a national level?' The brief answer is: 'yes'. Taxation is a national competency, even in the European Union. Any country can strive to gain competitiveness by shifting the tax burden from labour towards resource use, thereby future-proofing their industries. Countries should and can lead by example, which is demonstrated clearly by tax shift

trailblazers such as Sweden, Finland, Denmark, the Netherlands and the UK.

Inspiration on leadership can also be drawn from carbon pricing initiatives (see Box 6.1, page 30).

In this respect it is particularly striking to see sub-national pricing schemes emerging ahead of national government action: for example the Shanghai (pilot) emission trading system, Tokyo cap and trade system, the Catalonia region carbon tax, and the Alberta and British Columbia carbon taxes (OECD 2018q).

Leakage

An often-raised question is: 'what about 'leakage' when a company shifts activities from a regulated region to less-regulated regions?' Research demonstrates that these effects are limited (eg Arroyo-Currás et al. 2015).³⁸ According to the OECD, tougher environmental laws do not hurt competitiveness since a disadvantage in 'dirty' industries provides a corresponding advantage in 'cleaner' industries. This is why:

'Governments should stop working on the assumption that tighter regulations will hurt their export share and focus on the edge they can get from innovation.'
(OECD 2018r)

And according to the World Bank:

'The risk of carbon leakage declines as more countries take concrete actions to prevent climate change. International cooperation through carbon pricing instruments and climate finance can help redress the existing asymmetry in carbon pricing signals, reduce concerns about their impact on competitiveness, and eliminate the need for protection of firms.'
(World Bank 2015b)

In short: fear of leakage cannot be an excuse for inertia. If anything, it should drive governments to step up international cooperation. Since there will always be border effects when countries develop policy at different speeds, coordination will be essential for ultimately achieving an international 'level playing field'. The saying 'alone we go faster, together we go further' is applicable here. This brings us to our final recommendation.

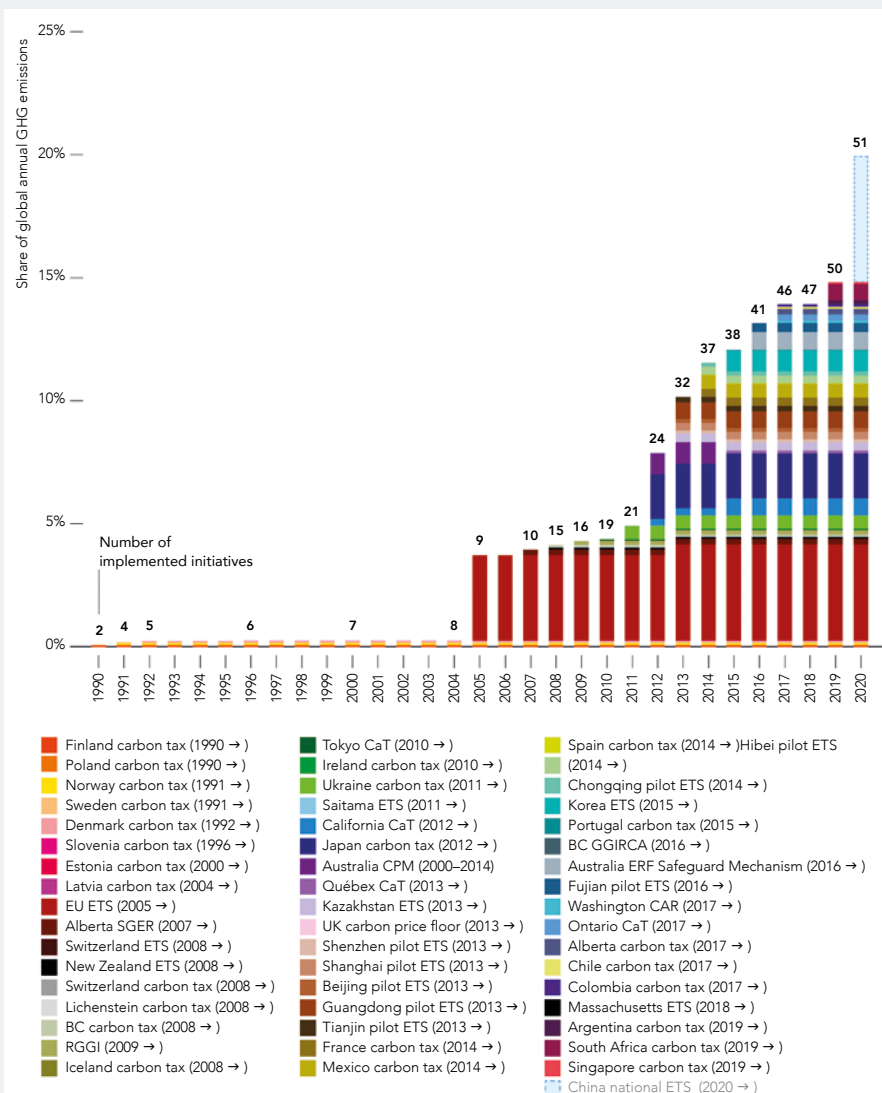


Box 6.1: Leading by example: the case of carbon pricing

Over the years, 51 countries and sub-national jurisdictions have taken the step of unilaterally putting a price on carbon (26 of these countries have implemented carbon taxes) (see Figure 6.1).

This demonstrates that leading by example is possible, and there is hope that more jurisdictions will follow. 88 Parties that have submitted their nationally determined contributions to the Paris Climate Agreement (representing 56% of global emissions) have stated that they are planning or considering the use of carbon pricing as a tool to meet their commitments (IBRD/World Bank and ECOFYS 2018). China has announced the establishment of the largest carbon market in the world: an ETS that will start at 1.5 times the size of the European Union ETS (Hafner et al. 2018).

FIGURE 6.1: Regional, national and subnational carbon pricing initiatives: share of global annual GHG emissions covered (IBRD/World Bank and ECOFYS 2018)³⁹



Note: Only the introduction or removal of an ETS or carbon tax is shown. Emissions are presented as a share of global GHG emissions in 2012 from (EDGAR) version 4.3.2 including biofuels emissions. Annual changes in GHG emissions are not shown in the graph. Due to the dynamic approach to continuously improve data quality using official government sources, the carbon tax only covering F-gases in Spain was added. The information on the China national ETS represents early unofficial estimates based on the announcement of China's National Development and Reform Commission on the launch of the national ETS of December 2017.

Source: World Bank Group, 2018

It's critical for governments to work together with the governments of other countries to achieve the same environmental and social objectives. This lays the ground for global coordination.

VI. INTERNATIONAL COOPERATION IS KEY

Putting cooperation ahead of competition

The world is more interconnected than ever before. Governments need to navigate a complex landscape of national and international interests. Businesses operate in competitive worldwide supply chains and globalised labour markets. Environmental challenges, such as climate change, do not stop at borders either. It is clear that the seismic changes that we are experiencing in climate and employment require an international response.

ACCA's 2017 report *Public Trust in Tax* survey, conducted jointly with the International Federation of Accountants (IFAC), found that 73% of people in G20 countries think it is important or very important for governments to cooperate with each other on tax policy to create a more coherent international tax system (ACCA et al. 2017). It is a clear signal to governments to put tax cooperation ahead of competition. According to the latest IPCC report, international cooperation is a 'critical enabler for developing countries and vulnerable regions to strengthen their action for the implementation of 1.5°C-consistent climate responses' (IPCC 2018a). Simultaneously with national steps, negotiations should start to harmonise taxation across regions.

How to cooperate?

There is no single answer as to how governments should work together. In some cases it will mean creating coalitions across specific sectors (eg the aviation sector is developing a carbon pricing mechanism in the form of a carbon-offsetting scheme (IATA 2018); the maritime transport industry has committed to halving carbon emissions by 2050 (IMO 2018)), and across sub-national jurisdictions (connecting provinces, territories and states). The government of Canada, for example, has worked with provinces and territories, giving them the flexibility to design their own climate plans, which have included putting a price on carbon pollution. Nine territories and provinces developed their own systems or chose to adopt the federal pollution pricing system. The remaining four provinces are expected to join the ranks.⁴⁰

□ 'This is the next step in the government's plan to protect the environment and grow the economy. Any direct proceeds collected will go directly back to people in these provinces. Households will receive a Climate Action Incentive, which will give most families more than they pay under the new system. Funds will also be given to the provinces' cities, schools, hospitals, businesses, and Indigenous communities to, for example, help them become more energy efficient and reduce emissions, helping Canadians save even more money, and improve our local economies'. (Trudeau 2018)

Other levels of cooperation are to be explored between (neighbouring) countries,⁴¹ within regions (such as the European Union) and globally through international platforms such as the G8, G20, OECD and United Nations (for an overview of ideas on setting a global tax, a sector carbon tax and a regional carbon tax, see Godfrey 2012). It's critical for governments to work together with the governments of other countries to achieve the same environmental and social objectives. This lays the ground for global coordination.

DEVELOP A SHARED VISION

The starting point of any discussion on pricing mechanisms and use of revenues should be a shared vision on societal goals, rather than specific measures. Only when policymakers agree on the long-term goals (eg circular economy or safeguarding the population from the impacts of climate change) will they be able to agree on the specific measures to align tax policy with those goals. The OECD could provide an excellent platform for such exchange on the evolution of tax.

Thus far, we have focused on the role of governments and policymakers. Businesses are now playing an increasingly important role in leading the change, as the next chapter will consider.



7. Businesses are leading the change

RISK ASSESSMENTS AND DISCLOSURE

In recent years, business' environmental and social impacts have become an increasingly important topic in the boardroom. 92% of the world's largest 250 corporations now report on their sustainability performance (GRI n.d.). Last year, the amount of catastrophe-related losses covered by insurance reached an all-time high of €110bn (European Commission 2018b). This means that the costs of climate disruption have become a reality, and companies increasingly need to assess how future-proof they are. The Financial Stability Board's Task Force on Climate-related Financial Disclosures, commissioned by the G20, provides recommendations on how organisations should disclose consistent information on the climate-related financial risks and opportunities they face (Bartels and King 2017).

'Companies that invest in activities that are susceptible to climate-related risks may be less resilient to the transition to a lower-carbon economy; and their investors may experience lower returns. ...Investors need adequate information on how companies are preparing for a lower-carbon economy; and those companies that meet this need may have a competitive advantage over others'.
(TCFD 2018)

Taking the megatrends in Chapters 1 and 3 in consideration, the reporting and assessment of the impacts, risks and opportunities of climate change and resource constraints will become more and more topical.

HOW BUSINESS CAN LEAD THE CHANGE

Business leaders are already leading the change in a number of ways, including (i) by advocating climate action and carbon pricing, (ii) by applying internal carbon pricing (and sometimes internal water pricing) and (iii) by developing new business models, as will be explored more below.

i. Companies and investors are advocating carbon pricing

Since 2014, several major business initiatives in support of carbon pricing have been launched (see box 7.1). Individual CEOs also have petitioned policymakers to take bold climate action. Such public support for climate action by business leaders is a strong incentive for national and local governments to work on effective policy measures.



Box 7.1: A selection of business initiatives in support of carbon pricing

In 2014, the World Bank published a statement titled *We Support Putting a Price on Carbon*. More than 1,000 companies and investors, as well as 74 countries, signed the statement (World Bank 2014).

In 2015, companies and investors with over \$11 trillion in assets signed the Paris Pledge for Action (Prince of Wales's Corporate Leaders' Group 2015).

In April 2017, companies with \$4.9 trillion in assets under management and \$700bn in revenue urged G20 governments to act on climate change, including carbon pricing:

'We are fully aware that climate-related financial disclosure is not the only mechanism needed to help implement the Paris Agreement. It needs to be complemented by a suite of mechanisms – for example, effective carbon pricing and phase-out of fossil fuel subsidies – that incentivise a shift of investment to climate smart activities and assets.'
(World Economic Forum 2017)

In May 2017, 400 investors with more than \$22 trillion in assets urged G7 and G20 governments to act on climate change, including carbon pricing:

'As long-term institutional investors, we believe that the mitigation of climate change is essential for the safeguarding of our investments...Investors are willing and ready to work with governments to facilitate the changes that are needed to improve the pricing of climate-related financial impacts, and to mobilise the capital flows that are required to underpin a strong and resilient financial system.'
(PRI 2017)

By October 2018, 350 investors representing \$30 trillion in assets signed the *Global Investor Statement to Governments on Climate Change*, which includes a call to 'put a meaningful price on carbon' (The Investor Agenda 2018).

In 2017, almost 1,400 companies factored an internal 'shadow price' on carbon into their business plans, representing an eight-fold leap over 4 years.

ii. Companies are applying internal pricing

Internal carbon pricing In IEA's *World Energy Outlook*, carbon prices will reach \$75–\$100 per tonne of CO₂ by 2030, in a scenario consistent with meeting Paris Climate Agreement goals (Hafner et al. 2018). Many business leaders are acting in anticipation of the policy, which they believe is inevitable. In 2017, almost 1,400 companies factored an internal 'shadow price' on carbon into their business plans, representing an eight-fold leap over four years (CDP 2018). Applying such pricing has been proven to shift investment decisions toward low-carbon options as they become more competitive than polluting options (Ahluwalia 2017).

In 2016, Unilever, for instance, began internally pricing the emissions from its manufacturing operations and subtracting that from the capital budgets allocated to each business division. That money goes into a fund – now worth about €50 million a year – which is used to install clean technologies (Unilever 2018). A number of organisations have published best practice guides to implementing internal carbon pricing in businesses (see eg ECOFYS et al. (2017); WBCSD (2015); Alberola and Afriat (2016); UN Global Compact et al. (2015); Microsoft Corporation (2013)).

Internal water pricing Similar issues arise with water supplies. Business leaders expect constraints on access to water, higher water tariffs and physical shortages and they realise that water issues can damage their credit rating, insurance costs and brand value (Ridley and Boland 2015). These developments have stimulated businesses to assess the value of water throughout their operations and across their value-chain: see, for example, Holcim (2014), Veolia (2014) and WBCSD (n.d.). More than 50 companies, including Colgate Palmolive Company and Diageo Plc, have established internal water pricing (CDP 2017). Nestlé, for example, has introduced an internal shadow price for water ranging between CHF1 and CHF5 per m³ depending on the water stress of the factory's location (Nestlé 2015).

In addition to disclosing environmental information, there is an opportunity for companies to show investors how they are contributing to the social goals of the SDGs, for example by disclosing information on decent jobs, living wages, training opportunities and pension contributions.

iii. Developing new business models Adapting to changing circumstances

Business leaders are well aware that adapting to changing market conditions is what makes companies survive over the long term. In the words of Feike Sijbesma (CEO of Royal DSM):

□ *'Anyone who hopes to survive in business must understand the importance of adaptability. When conditions change in your environment – for example, if public demand for your product or service changes, or can be expected to change – you can't just bury your head in the sand and pretend it isn't happening. Consider what happened to Blockbuster Video when they failed to anticipate how the public would respond to Netflix. ... We need to adapt to changing times'.*
(Quoted in Lefko 2016)

Business leaders must now make crucial decisions about mitigating the impacts of their supply chains and managing their risks and opportunities in the context of the SDGs. They are moving forward in an unprecedented way. The *RE100* initiative, for example, brings together 152 leading companies that are committed to 100% renewable power, creating a demand for 184 TWh of renewable electricity – more than the electricity consumption of 14 US states.⁴² Another example is the *We Are Still In* coalition whose members represent over \$9.4 trillion and comprises more than 3,500 cities, states, tribes, businesses and investors, college presidents, faith and cultural institutions and health systems that are working towards the US targets under the Paris Climate Agreement.⁴³

Business model innovation Driven by competition and enabled by technological innovations, new business models are emerging in every sector (ACCA 2018c). Table 7.1 provides just a selection of examples from well-known brands.

TABLE 7.1: Business model innovation, selected examples by industry

INDUSTRY	BUSINESS MODEL INNOVATION
Food	Heineken has built a circular brewery in Mexico where every piece of waste is repurposed or recycled (Peters 2018)⁴⁴ Nescafé has planted 2.5m native shade-providing trees within and around coffee farms to protect soil against erosion and improve soil fertility and water retention while offering opportunities for income diversification to the farmers, through the sale of timber and fruit (Nestlé 2018)
Energy	Total invests \$300m to install solar capacity at 5,000 gas stations around the world (Total 2015) BP and Dupont have developed a second-generation biofuel⁴⁵ Vattenfall is building the first offshore wind farm without subsidies (WindEurope 2018)
Metals & mining	Teck recovers materials from e-waste (Teck 2011) TataSteel has developed technology that reduces CO₂ emissions in the steelmaking process by 50% (Tata Steel 2018). Steel company SSAB, mining company LKAB and Vattenfall are building a testing facility for steel using hydrogen (Duurzaam Bedrijfsleven (2018) GemChina collects and recycles materials from discarded batteries (Ellen MacArthur Foundation 2017a)
Vehicles & tires	BMW/Mini offers car-sharing and services reusing batteries for flexible storage of renewable energy (BMW Group 2016) Volvo has built an electric refuse truck model which can carry a gross weight of 27 metric tons (Rosengren 2018) Porsche will give up diesel to set its sights on an electric and hybrid future (Schmidt 2018) Scania has built electric highways in Sweden, Germany, and Italy (Scania 2018)
Consumer goods	Philips Lighting (now Signify) offers a 'pay per lux' service model in which it retains ownership of the materials in lamps (Ellen MacArthur Foundation 2017b) Adidas sold 1m shoes made out of ocean plastic in 2017 (Kharpal 2018) 11 brands (Amcor, Ecover, Evian, L'Oréal, Mars, M&S, PepsiCo, The Coca-Cola Company, Unilever, Walmart and Werner & Mertz) are working towards using 100% reusable, recyclable or compostable packaging by 2025. Together this represents more than 6m tonnes of plastic packaging per year (New Plastics Economy and Ellen MacArthur Foundation 2018) YCloset offers an online clothing subscription service in China (Ellen MacArthur Foundation 2017c)
Technology	Apple global facilities – retail stores, offices, data centres and co-located facilities in 43 countries, including the US, the UK, China and India – powered with 100% clean energy (Apple 2018) Philips refurbishes medical equipment (Phillips 2017) Mitsubishi applies a 'pay-per-use' service model for elevators to retain ownership of materials (Holland Circular Hotspot n.d.)
Transport & logistics	Deutsche Post/DHL is deploying electric vehicles (Deutsche Post DHL Group 2017) Central Japan Railway Company (JR Central) high speed train has a market share of 86% versus 14% for the aeroplane between Tokyo and Osaka (515 kilometre) (Central Japan Railway Company 2017) Maersk Line has developed a Cradle to Cradle Passport for ships, creating a detailed inventory that can be used for identifying and recycling the components (Ellen MacArthur Foundation 2017d)
Services	ISS offers Cleaning Excellence contracts that can reduce the use of detergents by 75%, and of water consumption and disposal by 70% (ISS n.d.)
Financial services	ABN AMRO has committed to financing €1bn in circular assets by 2020 (ABN AMRO n.d.) Credit Suisse Group, ING Bank, FMO and UNDP-UN Social Fund jointly provide funding for circular economy, sustainable energy and social impact in Asia (SFC Asia 2018)
Pharmaceuticals	GlaxoSmithKline has eliminated chlorinated solvents in antibiotics production, which has cut the amount of waste produced and reduced carbon emissions at the site by 40% (GSK 2014: 41)
Cement	Italcementi has developed a special mix for porous and pervious pavements, roads, walkways and parking lots, specialised for rain and storm water management (Italcementi 2014). Lafarge has developed cement with a 25–30% smaller carbon footprint (Aether Cement 2018).
Retail	IKEA offers solar panel purchase and installation services (IKEA Group 2014).
Chemicals	AkzoNobel Eco Premium Solutions – products that have a significant, measurable sustainability benefit over the competition – account for 19% of sales (AkzoNobel 2018) DSM and Mohawk have developed a technology to make 100% recyclable carpets (Ellen MacArthur Foundation 2017e)

The circular economy means moving away from today's linear 'take-make-waste' industrial model to a carbon-neutral and regenerative model in which products are 'made to be made again'.

These business models are generally more resource-efficient than 'business as usual' models, but, at the same time, they require more research and development and human input to organise take-back systems for products, new supply-chain management, and improved service models. Sustainable business models currently need to compete with activities based on creating tax-free pollution. Therefore, in principle, these new business models would gain competitiveness if 'the polluter pays' principles were to be applied so as to lighten the tax burden on labour. The risks and opportunities of such a shift are not evenly distributed, but in the face of the megatrends described in Chapters 1 and 3, 'business as usual' is no longer an option. Fortunately, innovation and adaptation are in the DNA of business and every sector has opportunities for developing business models that are fit for the future. An inspiring perspective on business model innovation is found in the concept of the 'circular economy', which has gained traction over the last few years.

THE CIRCULAR ECONOMY

The circular economy means moving away from today's linear 'take-make-waste' industrial model to a carbon-neutral and regenerative model in which products are 'made to be made again' (Ellen MacArthur Foundation 2017f). The Ellen MacArthur Foundation defines a circular economy as follows:

'an industrial system that is restorative or regenerative by intention and design... It replaces the "end-of-life" concept with restoration, shifts towards the use of renewable energy, eliminates the use of toxic chemicals, which impair reuse, and aims for the elimination of waste through the superior design of materials, products, systems, and, within this, business models'.
(Ellen MacArthur Foundation 2013)

In this way, finite resources and materials are not wasted, and businesses can add value over and over again by applying business models such as repair and maintenance services, recycling, remanufacturing and refurbishment (as illustrated by Figure 7.1).

FIGURE 7.1: From a linear to a circular economy

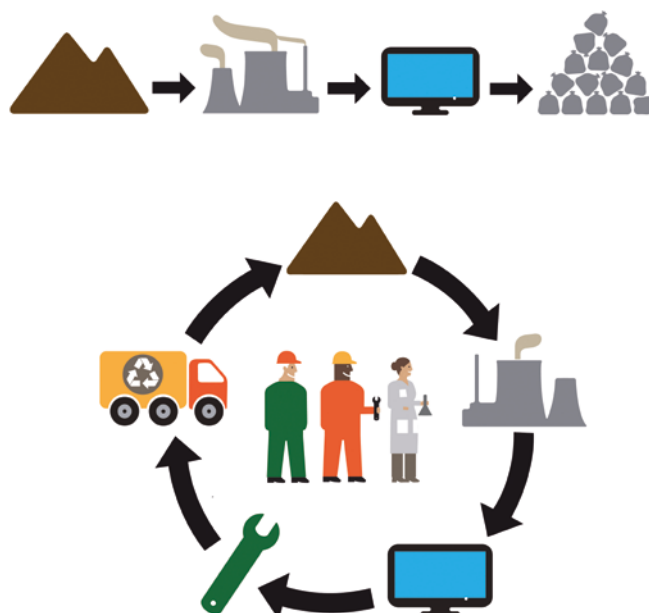


Illustration by The Ex'tax Project

Circular business models tend to be more labour and knowledge-intensive than linear models, as they revolve around providing services with products and innovation.

Materials use and carbon emissions are closely linked. An upcoming OECD report states that more than half of all greenhouse gas emissions are related to materials management activities. Global materials use is projected to more than double from 79Gt in 2011 to 167Gt in 2060 (OECD 2018s). Several governments have adopted the circular economy as a policy goal (see Box 7.2).

CIRCULAR BUSINESSES ARE LABOUR AND KNOWLEDGE INTENSIVE

Small enterprises such as Fairphone (modular smartphones) and Bundles (pay-per-wash washing machines) as well as multinational corporations are exploring innovative circular business opportunities. Royal DSM (an €8.6bn health, nutrition and materials company), for example, turns agricultural waste into second-generation biofuels and has developed a technology to make 100%

recyclable carpets (DSM 2016). Philips (a €25bn electronics business) aims for 15% circular revenues by 2020 and fully closing the loop on large medical equipment (Phillips 2017). Another example is IKEA, which has started to repair and re-sell its own furniture (Harris 2018). Recently, IKEA has announced its goal of being a fully circular business by 2030 (IKEA 2018). This means IKEA products will be moving in a 'loop' rather than in a line that ends in landfill or an incinerator.

All business models in Table 7.1 are part of this transition. But as mentioned before, there is a catch. Circular business models tend to be more labour and knowledge-intensive than linear models, as they revolve around providing services with products and innovation. One clear example from the fashion industry is MUD Jeans that has a take-back system for their jeans (see Box 7.3).



Box 7.2: Governments going circular

In 2009, China's *Circular Economy Promotion Law* came into force (World Bank 2017b). In 2015, the European Commission adopted a *Circular Economy Action Plan*, with a stated goal of unlocking 'the growth and jobs potential of the circular economy' (European Commission 2015c). Several countries and regions have since adopted a circular roadmap or strategy, including Scotland (Scottish Government 2016), Germany (Federal Ministry for the Environment, Nature Conservation, Building and Nuclear Safety 2016), Portugal (Ministry of Environment, Portugal 2017),

Italy (Ministry for the Environment, Land and Sea and Ministry of Economic Development 2017), France (Ministère de l'Économie et des Finances 2018), Finland (Finnish Innovation Fund Sitra 2016), and Slovenia (Ministry of Environment and Spatial Planning 2018). In 2016, the Dutch government published its ambition to realise an (interim) objective of a 50% reduction in the use of primary raw materials (minerals, fossil and metals) by 2030 (Government of the Netherlands 2016). Thailand is expected to present a circular roadmap soon (Apisitniran L. and Theparat, C. 2018).



Box 7.3: The case of MUD Jeans

MUD Jeans is a small enterprise challenging the fashion industry, which is one of the most polluting sectors in the world. The fashion industry uses harmful pesticides, dyes and solvents, and large amounts of water and emits more greenhouse gases than all international flights and maritime shipping combined. Every second, a garbage truck of textiles is landfilled or incinerated.

An estimated \$500bn value is lost every year owing to clothing that's barely worn and rarely recycled. Described as 'pioneering a lease model for organic cotton jeans', MUD Jeans seeks to close the loop on jeans production. Customers can rent jeans and return them for repair or recycling. MUD Jeans also rescues vintage jeans and 'make them extra cool by customising them'.⁴⁶

The private sector can become a catalyst for better policy by engaging proactively with governments to push for forward-looking policies to promote circular and inclusive business growth.

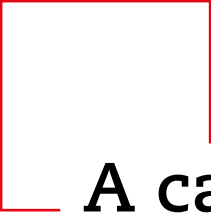
TAX SYSTEMS ARE HOLDING BACK CIRCULAR BUSINESS MODELS

In a circular business model, when customers return a product this triggers a chain of customer service, handling, sorting, quality monitoring, cleaning, repair and modification. In addition, companies need to invest in ambitious research and development efforts to develop new materials and production processes. Circular business models require innovation, customisation and a different level of customer service from the 'business-as-usual' selling of mass-produced products. When pollution is tax-free or even subsidised, and labour costs are high, businesses face a barrier to scaling up a circular business:

□ *'In the current tax system, labour is heavily taxed, while energy and natural resources are hardly taxed. Such tax system stimulates the opposite of the goals of a circular economy, in particular: more local employment, energy efficiency and more efficient use of materials and assets'.*
[Translated] Rob Boogaard (2016), former CEO of Interface (a company turning discarded fishing nets into carpet tiles)

As most studies on the circular economy conclude, reducing labour taxes and increasing green taxes will be key to achieving the circular ambitions set by governments and businesses (eg Ellen MacArthur Foundation 2013; Ellen MacArthur Foundation et al. 2015; Stegeman 2015; Finnish Innovation Fund Sitra 2016; Wijkman and Skånberg 2016; Ministry of Environment, Portugal 2017; Ministry for the Environment, Land and Sea and Ministry of Economic Development 2017). An update is needed to align tax policy with the goals of the circular economy and to address the competitive disadvantages that are currently embedded in national tax codes.

The private sector can become a catalyst for better policy by engaging proactively with governments to push for forward-looking policies to promote circular and inclusive business growth. With the business community, ACCA intends to further explore how a tax shift changes the dynamics in business.



A call for action

Humanity is facing massive challenges. The most daunting tasks are to adapt the metabolism of our economies to match the carrying capacity of the earth and stay below 2 degrees Celsius global warming. We face equally important social challenges in our societies, including enabling a growing population to develop to their full potential and find decent work.

Tax has an important role to play in tackling these megatrends, as tax structures have a fundamental impact on investment, employment and consumption decisions. As we have seen from new emerging business models, businesses are forging ahead to adapt to the challenges of our time. Governments now should respond, by providing clear financial incentives to enable inclusive and circular growth. It's time for tax systems to evolve – but we can only afford to make this a gradual transition, if we act now before it is too late.

We would like to recommend the following actions.

FOR GOVERNMENTS

- Put a price on pollution and resource-use, starting with abolishing fossil fuel subsidies and pricing carbon emissions.
- Use the tax revenues to reduce taxes on labour and expand social protection, in particular addressing the needs of lower-income households.
- Gradually increase the rate and scope of taxes on pollution and resource use.
- Engage with businesses and the public ahead of any changes, and communicate the impacts in a transparent manner.
- Work together with the governments of other countries to adopt a regional approach to achieve the same environmental and social objectives. This lays the ground for global coordination.

FOR BUSINESSES

- Evaluate the risks and opportunities related to global environmental and socio-economic megatrends.
- Apply internal carbon pricing and water pricing, and monitor other external costs as well as external benefits, to start shifting business investment decisions towards more inclusive and sustainable options.
- Adapt the business' governance, strategy-setting, risk management and performance measurement to respond to risks and opportunities – including considering opportunities for viable new circular and inclusive business models.
- Engage proactively with government to push for forward-looking policies to promote inclusive circular business growth.

'Survival of the fittest' means that species must adapt in time to changing circumstances. Considering our fast-changing world, tax systems will need to adapt too. It is now more rational to tax pollution and resource use than it is to tax labour. By rethinking the design of our tax systems in a holistic way, taxes can become a tool supporting the ambitions of an inclusive global economy that is fit for the future.



Discussion questions

ACCA wishes to explore perspectives on the tax shift

ACCA is committed to engaging with governments and business leaders on the topics in this discussion paper. Together with our stakeholders, we plan to hold workshops and roundtables to explore how tax reforms can best be implemented in different jurisdictions across the world. We invite you to reflect on the following questions that serve as the basis for our continuing discussions:

FOR BUSINESSES

Question 1:

If the tax burden on employment goes down (including personal income tax, payroll tax, social contributions and VAT on services), what will be the impact on your business, clients or project?

Question 2:

If taxes on natural resource-use (such as carbon emissions, other pollution, fossil fuels, metals, minerals and water) increase, what will be the impact on your business, clients or project?

Question 3:

What impact will a tax shift from labour to natural resource use have on your sector?

FOR POLICYMAKERS

Question 4:

What are the three greatest social challenges affecting your jurisdiction today?

Question 5:

If the tax burden on employment goes down (including personal income tax, payroll tax, social contributions and VAT on services), what will be the impact on your government's ability to resolve these challenges?

Question 6:

What are the three greatest environmental challenges affecting your jurisdiction today?

Question 7:

If taxes on natural resource use (such as carbon emissions, other pollution, fossil fuels, metals, minerals and water) increase, what will be the impact on your government's ability to resolve these challenges?

Question 8:

What level of impact will the tax shift have on the lowest-earning 40% of your country's population? What extra tax measures might help to mitigate this impact?

Please email your response to: Insights@accaglobal.com

Footnotes

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- 1 Inspired by Mr Feike Sijbesma, CEO of Royal DSM who employed Darwinism as a metaphor for his company's adaptation to changing circumstances (Sijbesma 2018).
- 2 See EU proposals for an interim digital services tax (European Commission 2018a). Italy, Spain, Singapore, Bangladesh and Colombia have each unveiled different digital taxes, to come into force between 2018 and 2020, and numerous governments, including the UK, have announced their intention of doing so.
- 3 This paper does not cover regional differences in detail. Instead, it will lay out a few remarkable similarities and similar challenges.

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- 4 For example: 36% of US workers (about 57 million Americans) participate in the gig economy through either their primary or secondary jobs, and nearly half of Californians working in the gig economy are struggling with poverty (McFeely and Pendell 2018; Daniels 2018).
- 5 OECD countries are Australia, Austria, Belgium, Canada, Chile, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Israel, Italy, Japan, Korea, Latvia (since 2016), Lithuania (since 2018), Luxembourg, Mexico, the Netherlands, New Zealand, Norway, Poland, Portugal, Slovak Republic, Slovenia, Spain, Sweden, Switzerland, Turkey, the UK and the US (Guillemette and Turner 2018).
- 6 Technology could potentially play a positive role here. Car maker BMW is often cited as an innovator in valuing the skills and experience of older workers. The company has implemented changes to its production lines aimed at improving ergonomics of its work environment (Soukenka and Rohan 2011).

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- 7 'Tax on personal income is defined as the taxes levied on the net income (gross income minus allowable tax reliefs) and capital gains of individuals.' 'Social security contributions are compulsory payments paid to general government that confer entitlement to receive a (contingent) future social benefit. They include: unemployment insurance benefits and supplements, accident, injury and sickness benefits, old-age, disability and survivors' pensions, family allowances, reimbursements for medical and hospital expenses or provision of hospital or medical services.' 'Tax on payroll is defined as taxes paid by employers, employees or the self-employed, either as a proportion of payroll or as a fixed amount per person, and that do not confer entitlement to social benefits. Examples of such taxes include: the United Kingdom national insurance surcharge (introduced in 1977), the Swedish payroll tax (1969–79), and the Austrian Contribution to the Family Burden Equalisation Fund and Community Tax' (OECD 2018a).
- 8 Includes line items 1110 (Income and profits of individuals), 2000 (Social security contributions) and 3000 (Taxes on payroll and workforce). Data include tax on capital gains in Chile, Mexico, Portugal, Poland and Spain (OECD 2018b).
- 9 In this paper, the term 'work' is used in a broad sense: it includes self-employment, entrepreneurship, and both part-time and full-time employment with or without contracts.
- 10 Single individual without children at the income level of the average worker. The tax wedge varies between different types of household and income intervals (OECD 2018c).
- 11 2014 is the latest period for which OECD has environmental tax data (OECD 2018f).

- 12 The Dominican Republic is an exception with 8% labour versus 14% green taxes (OECD 2018b; OECD 2018f).

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- 13 Labour demand and supply are affected by different aspects of labour taxation. See for example: Brys (2011); Dolenc and Laporšek (2010); Pierluigi and Roma (2008); Vermeend, van der Ploeg and Timmer (2008).
- 14 The Eurogroup comprises the finance ministers of countries whose currency is the euro.
- 15 See for example: 'Pushing more shoppers to scan their own items and make payments without the help of a cashier, has the potential to save Wal-Mart millions of dollars. For every one second in average transaction time at the Walmart U.S. chain, the company said it spends about \$12 million in cashier wages' (Wohl 2012).

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- 16 In 2015 (the latest year available), labour costs accounted for more than 50% of total R&D costs in 19 OECD countries. In eight countries, labour costs accounted for more than 40% of the total R&D costs. The remaining countries either spent more than 30% on labour costs, or did not provide data (OECD 2018e).

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- 17 Including costs associated with climate change-induced market and non-market impacts, impacts due to sea level rise, and impacts associated with large-scale discontinuities. IPCC referring to Warren et al. (2018).
- 18 Impacts include: greenhouse gas emissions, air pollutants, water pollutants, soil pollutants, water consumption and land use change (FAO 2015).

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- 19 VAT is also included in the tool. Primarily VAT is a consumption tax, not an environmental tax. But rate differentiation affects supply and demand, which in turn influences consumer decisions on specific products and services. This is the reason for including it in the tool.
- 20 Emission trading systems (ETS) are another way of pricing externalities. Such systems provide revenues for governments when emission rights are auctioned.

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- 21 The opposite is happening in The Democratic Republic of Congo, for example, which produces more than half of the world's cobalt. Yet, it remains one of the world's poorest countries because only 6% of the revenue garnered from mining exports makes it to the national coffers (Chutel 2017).
- 22 In some cases the difference between an ETS and a tax can be blurred. For example, 50% of the auction revenues from the European ETS are used by governments for climate- and energy- related purposes; the rest can be used for general purposes. The total revenues generated from the auctions between 2012 and June 2015 exceeded €8.9bn (Emissions-EUETS.com 2018).
- 23 The 'weak double dividend' and the 'strong double dividend', respectively (Park et al. 2012).
- 24 This diagram presents data from the OECD database for a selection of countries, for which consistent data is available throughout the 2000-2014 period.

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- 25 'These figures combine the IEA estimates of consumer price support with OECD inventory estimates' (OECD 2018g).

PAGE 20:

26 'The first, EUR 30 is a low-end estimate of the damage that carbon emissions currently cause. Pricing emissions above EUR 30 does not guarantee that polluters pay for the full damage they cause, or that prices are sufficiently high to decarbonise economies. A price below EUR 30 does mean, however, that emitters are not directly confronted with the cost of emissions to society and that incentives for cost effective abatement are too weak. The second benchmark, EUR 60 per tonne of CO₂, is a midpoint estimate of carbon costs in 2020, as well as a forward-looking low-end estimate of carbon costs in 2030. Rising benchmark values over time for carbon costs reflect that the marginal damage caused by one tonne of CO₂ increases with the accumulation of CO₂ in the atmosphere' (OECD 2018o).

27 'The wide range of values depends on numerous aspects, including methodologies, projected energy service demands, mitigation targets, fuel prices and technology availability' (IPCC 2018b).

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28 The exemption is included in the Energy Tax Directive 2003/96/EC (Article 14(1)(b)). However, Member States can tax aviation fuel for domestic flights and, by means of bilateral agreements, also fuel used in intra-EU flights (European Commission 2018c).

29 Two tonnes of freight carried 1,000km produces, by air, 4,138kg CO₂, by diesel train, 42kg CO₂ and, by container ship, 30kg CO₂ (AirportWatch 2018).

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30 The Ex'tax Project et al (2016) (Box 5.1) found that in some countries (such as Poland), the revenues from resource taxes in the tax shift scenario were more than 100% of personal income tax revenues. These surpluses were available as income support.

PAGE 25:

31 In the OECD, SMEs account for 99% of businesses. They provide the main source of employment, accounting for about 70% of jobs on average. Furthermore: 'certain aspects of business taxation, including asymmetric treatment of profits and losses, the distribution of taxation between capital and labour income and the design of R&D tax credits and incentives, can unintentionally disadvantage some young and small firms' (OECD 2017c). SMEs tend to operate in local markets, and since they depend on local labour inputs, they are particularly susceptible to high labour costs and do not have as many opportunities to shift production to low-income countries.

32 In 1996, the UK introduced a landfill tax designed to be revenue neutral through a reduction in employers' national insurance contributions. In 2010 the revenues raised from the tax were €1.2bn. The amount of waste going to landfill has almost halved since the tax was introduced. (Cambridge Econometrics 2013).

33 In 2007 Germany increased the VAT rate by three percentage points accompanied by a simultaneous cut in the unemployment insurance rate (European Commission (2014b)).

34 'In late 2012, Colombia approved a tax reform (Law 1607), which reduced the tax burden on the labor factor, or payroll taxes, in order to stimulate formal employment and enhance productivity. The loss in revenues resulting from these measures was neutralised with an adjustment to the corporate income tax and a simplification of VAT rates. The reform increased formal employment and reduced the unemployment rate, while increasing revenues as a result of enhanced growth.' (IADB 2015).

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35 The toolkit is under development; The Ex'tax Project welcomes suggestions.

36 Although legally, VAT is a consumption tax, in practice consumers pay VAT both on products (such as cans of paint) and services added to those products (the work of a painter).

PAGE 28:

37 In The Ex'tax Project et al. (2016), parts of the revenues are used to compensate citizens for increased living expenses (focusing on low- and medium income groups) and other parts of the revenues are used to reduce labour taxes for employers. In order to maximise the positive impact on the labour market, businesses gain part of the tax relief only insofar as they actually increase labour demand. This is a technique that has been applied in Spain to solve the extremely high unemployment rates.

PAGE 29:

38 This found that 'carbon leakage is limited to 16% of the emission reductions in pioneering regions' (Arroyo-Currás et al. 2015).

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39 IBRD/World Bank and ECOFYS (2018): 'Note: Only the introduction or removal of an ETS or carbon tax is shown. Emissions are presented as a share of global GHG emissions in 2012 from (EDGAR) version 4.3.2 including biofuels emissions. Annual changes in GHG emissions are not shown in the graph. Due to the dynamic approach to continuously improve data quality using official government sources, the carbon tax only covering F-gases in Spain was added. The information on the China national ETS represents early unofficial estimates based on the announcement of China's National Development and Reform Commission on the launch of the national ETS of December 2017.'

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40 The federal carbon pollution pricing system has two components: the fuel charge and the output-based pricing system (OBPS) for emissions-intensive trade-exposed industries.

41 Friends of Fossil Fuel Reform (FFFR) is an example of a coalition of nations, in this case committing to abolishing fossil fuel subsidies. The 2018 Nobel Prize winner William Nordhaus advocated that governments should form 'carbon clubs' – coalitions between countries based on a common carbon price and external tariffs on imports from non-club countries (Nordhaus 2014).

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42 See RE100's website for more information: <http://there100.org/>

43 See We Are Still In's website for more information: <https://www.wearestillin.com/>

PAGE 34:

44 'Waste heat from a neighbouring glass factory helps run the plant's boilers. A water treatment plant ... will purify water used in production and reuse 30% of it in other processes. As the water treatment plant runs, it will produce biogas, which can also be used for heat in the brewing process. The sludge from the plant will go to nearby farms to improve the soil, while spent grains will become cattle feed. Broken glass is recycled at the next-door glass factory.' (Peters 2018).

45 For more information see <http://www.butamax.com/>

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46 See the MUD Jeans website for more information: <https://mudjeans.eu>.

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