

Section III Policy Approaches For a Fair Consumption Space



In a world with a limited and fast-shrinking global carbon budget, coupled with vast power and economic inequalities, how do we allocate the remaining carbon allowance in a manner that is fair while drastically decreasing our footprints in a limited timeframe to avoid irreversible ecological damage?

One of the conclusions of the IPCC assessment is that the world is now very close to the point where the Paris target of limiting heating to 1.5°C will get out of reach. Even under optimistic assumptions, a 50/50 chance of achieving the 1.5°C target requires global emissions to peak by the middle of the current decade—that is, 3–4 years from now—and to fall at unprecedented rates until reaching net zero around mid-century (IPCC 2021b). All IPCC scenarios that manage to limit heating to 1.5°C either employ the most drastic reductions, or they first overshoot 1.5°C and then rely on the massive deployment of negative emission technologies in the second half of this century, although there are no guarantees that such measures will work at scale.

What is happening to the planet as a result of continued emissions of greenhouse gases is unprecedented and this calls for unprecedented actions. Efforts made so far, which have been typically measured to protect economic growth and to avoid inconveniencing the polluting consumer class, have been woefully inadequate—hence the worsening trends. The rapidly changing climate and the increasing risks it generates have been called an emergency, even officially recognised as such (Climate Emergency Declaration 2021) by over 2,000 local governments in 34 countries (encompassing over one billion people), but it is not yet treated as such. The ongoing public health crisis caused by the COVID-19 pandemic offers an interesting comparison. In this case, many governments have taken quick and decisive actions despite the negative economic impacts of these policies.

In the following brief chapters, we highlight a number of perspectives and approaches that may help society transition towards a fair consumption space within planetary boundaries. For this, we invited some leading global thinkers and doers for contributions. We have chosen to focus on a few radical topics that are not yet part of the mainstream climate discourse. By doing so, we hope to broaden the discussions on how to deal with

the escalating climate emergency in an equitable manner and within a short timeframe.

The approaches can be grouped in three sets of policy approaches: the first is removing carbon-intensive options from the market and driving social innovation, through choice editing (Chapter 5). The second requires setting limits for environmentally harmful consumption and staying within the remaining carbon budget. Tina Fawcett and Yael Parag (Chapter 8) discuss personal carbon allowances and ask if the time has come for carbon rationing. To not put all the weight on consumers, Joachim H. Spangenberg (Chapter 9) examines the role of international carbon allowances, institutions, and the global trade regime, and discusses the European Commission's planned Carbon Border Adjustment Mechanism and how it could avoid unfairly affecting low-income countries where cheap labour has been used to attract high intensity production facilities relocated from industrialised nations. The third set of policy approaches is intended to ensure a more equitable society (through a social guarantee including universal basic services, and adopting a sufficiency approach to address climate change). Anna Coote writes on universal basic services, going beyond universal basic income to ensure that meeting human needs through public services and other collective measures is more equitable, affordable, and sustainable than simply providing cash benefits to support individual market transactions (Chapter 6). Yamina Saheb explores how much is enough and contrasts a sufficiency approach with the current obsession with market solutions and technology efficiency (Chapter 7). Finally, Luca Coscieme highlights the co-benefits of a society living within a fair consumption space, drawing from the Wellbeing Economy Alliance (WEAll 2020) and linking 1.5-degree lifestyles to personal, community, and ecological wellbeing, as well as a stimulant for a wellbeing economy (Textbox E).

Some of these sections will be published subsequently in longer versions as part of a planned series of “Think Pieces” on rapid decarbonisation.

5 – Choice Editing: Taking Out the Harmful Consumption Options

Choice editing involves the use of specified criteria and set standards to filter out unsuitable options in the range of products and services being brought to the market. It is done by manufacturers and service-providers when they decide on product and service portfolios, as well as their designs. Business choice editing criteria is often based on, for example, profitability, available technology, or attractiveness. Brand owners choice edit what goods and quality to bring to different market segments; retailers choice edit what products they shelve for their customers in different zip codes (Gunn and Mont 2014; Kumar and Dholakia 2020). Governments also use choice editing to eliminate unsafe products or services, or to encourage development of safer alternatives, which may otherwise not be made available. Choice editing is effective because what is not available cannot be consumed. Consumption choice is

a function of the options available on the market—or, in other words, a response to opportunities created by a combination of government policy (or lack thereof), decisions by manufacturers and service providers, and decisions by retailers on what to shelve.

Lifestyles impacts of climate change are accelerated by cultural norms that encourage consumerism, are driven by advertising, exacerbated by planned obsolescence, and are proliferating in a growth-driven macroeconomic context that depends on ever increasing private and public consumption. Some of the products flooding the market and contributing to climate change, arguably, neither have a function nor contribute to the wellbeing of consumers, their existence predicated on fulfilling a profit motive. Yet, in our current situation, with a highly constrained ecological budget and the need to shrink our footprint very quickly, we need to assess carefully what products use our scarce natural resources and what should be allowed to use up the very limited carbon allowance. One approach to addressing overconsumption is to limit excess; to ensure available options fit within a fair consumption space where everyone first has an opportunity to meet their fundamental human needs (Max-Neef 1991) within the planetary boundaries: hence choice editing.

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5.1. History and common examples of choice editing

The UK Sustainable Consumption Roundtable, exploring how consumer choices could stay within environmental limits, concluded that given the complexity of consumption and considering the multiple influences on consumer decisions, it is not practical to place the burden of change on consumers alone. The Commis-

sion concluded that “the lead for ensuring environmental stewardship must lie higher up in the supply chain” (Sustainable Consumption Roundtable 2006). Among its recommendations is the need for choice editing.

Traditional government use of choice editing is common for public health and safety reasons. For example, in most European countries a consumer cannot simply walk into a shop and buy a pistol or hard drugs. These options have been edited out of the market due to concerns for safety. Smoking in public places is banned in several countries, and seatbelts are mandated for car drivers out of concerns for the public wellbeing. Subsidies and stimulus packages are allocated to encourage new businesses in order to edit in new markets and production opportunities. Choice editing is therefore not new, having been a strong basis for public policy. And in recent years, choice editing out of concern for environmental harm has been implemented, for example, banning leaded petrol and ozone-depleting chlorofluorocarbons (CFCs).

Awareness of the climate crisis has led to widening application of choice editing. The phasing out of incandescent light bulbs from domestic use in Australia, the European Union, and other countries are contemporary examples of governmental choice editing driven by sustainability concerns. Likewise, the ban on plastic shopping bags and other single use plastic packaging from supermarkets by several countries can be seen as steps towards choice-editing for packaging (Akenji et al. 2020). These are basic examples and not nearly enough in a climate emergency.

5.2. Mandate for sustainability choice editing

National governments have signed on to several policy frameworks with objectives and targets that require choice editing. The most recent report of the IPCC warns that human-induced climate change has already caused irreversible damage and that the further we delay action, the more entrenched the dramatic wildfires, floods, poor harvests, and physical illnesses we will witness. As these reports show, more than half of the contributing emissions can be reduced from changes in meat and cheese consumption, fossil-fuelled transportation, and changes in size and temperature of housing. The Convention on Biological Diversity has similar priority areas for biodiversity loss. And yet government action to meet their obligations under these frameworks largely skirt actions that would reduce consumerism, despite rising evidence of acceptability of radical but fair public policy to address sustainability issues. To a large extent this avoidance of choice editing has been due to the fear of the consumer class—the mostly overconsuming population that also doubles as voters.

The optics, especially in democratic or so-called free societies, of government intervention in private consumption choice is perceived as too costly for politicians and for economic growth. For this reason, Di Giulio and Fuchs (2014) approach the prospect of limiting unsustainable consumption choices by acknowledging the need for caution in assessing how it could be feasible—not only empirically but especially politically. The view that establishing consumption limits is against democratic governance and modern systems ensuring individual rights and freedoms is countered by di Giulio and Fuchs with two arguments that can be applied to choice editing and ensuring a fair consumption space. The first is that the pursuit of the common good is the responsibility of the political community—those mandated with governing. Governing includes the management of commons, which the atmosphere and most natural resources are considered to be. Thus the design and implementation of consumption limits is a way of guaranteeing the common good, especially when there is scarcity of said resources or risk that they may be severely (or “irreversibly” as put by the IPCC) damaged. The second argument is that since it is the task of the state to prevent discrimination and protect individuals against infringements on their freedom by others, the state has the right and the obligation to prevent individuals from consuming to such an extent that access to a sufficient quality and quantity of resources is denied to others. Given the significant asymmetries in power that exist in the market and in politics today, the need of exerting this right and obligation to protect freedoms is, in fact, particularly important (Di Giulio and Fuchs 2014). This is only reinforced by recent observations of unpredictable and dangerous weather events, and the message in the recent IPCC report highlighting the prohibitive consequences of global temperature rise above 1.5 degrees (IPCC 2021b).

Whereas traditional choice editing has primarily been through the filter of public safety, health, and security, in a climate emergency governments need to incorporate and prioritise sustainability in their choice editing criteria.

5.3. Implementing choice editing

There are several ways to implement choice editing, from removing the worst products, to making the least sustainable choices less attractive or more expensive, to shifting the context for making choices (i.e. changing the broader “choice architecture”) (Maniates 2010).

Removing the worst products is best seen with programs like Japan’s “Top Runner” energy efficient appliance program. Each year, the government rates major appliances for energy efficiency, and the top-rated ap-

pliances set the standard for future years, thus nudging the worst performing models out of the market. This essentially **creates a race to the top** as there is a clear incentive for companies to make models more efficient year after year. Thus it is not surprising that in the early 2000s, TVs, air conditioners, and refrigerators became 26, 68, and 56% more efficient, respectively (Inoue and Matsumoto 2019).

A second strategy is to make the least sustainable choices more expensive. Plastic bag taxes are a good example. Rather than banning, which draws consumer ire as well as industry lawsuits and work-arounds, taxing plastic bags can also reduce consumption significantly. The city of Chicago, for example, banned thin plastic bags in 2015 but allowed thicker plastic bags, which rather than reducing plastic bag usage significantly, led to retailers offering customers thicker plastic bags. In 2017, Chicago tried again, replacing the ban with a 7-cent tax, bringing plastic bag usage down from 82% per trip to 54% (Parbhoo et al. 2018). Gentler changes can also help people get used to a shifting choice architecture. As more people shift to reusable bags to avoid the tax, when taking the next step of banning plastic bags, citizens are more comfortable with this further edit, having already gotten used to cultural shifts, such as bringing their own reusable bags.

Third, and most broadly, governments and institutions can **shift the choice architecture**, such as when cafeterias remove trays, diners consume less food (Thiagarajah and Getty 2013), or how municipal governments, by building sidewalks and bike lanes and implementing traffic calming infrastructure (like speed bumps), can draw people from cars to more sustainable modes of transportation (Aldred and Goodman 2020). In order to reduce car traffic and to encourage walking, biking, or public transport use, London introduced the Congestion Charge, which vehicles must pay in order to drive within the charge zone in central London. In addition, vehicles that do not meet Ultra Low Emission Zone standards must pay an additional charge to drive in further restricted zones (Transport for London n.d.).

Perhaps one of the most effective, and subtlest forms of choice editing is to **alter the default options**. Limiting the use of public spaces for highways and car parking promotes innovation for more sustainable transport; revising local government zoning laws, size limits for housing construction, and raising the bar for minimum housing insulation standards defaults towards sustainable housing; raising ethical standards for animal farms and mandating reforestation and regeneration of lands previously allocated for cattle and pigs would encourage low-carbon and healthier diets.

Tiered pricing is also a great example of shifting choice architecture. By increasing prices according to

usage, tiered pricing expands a basic level of access for all but ratchets down consumption as prices increase along with total usage. In Durban, South Africa, for example, the first 750 litres of water per month is free (recognizing that access to water is a basic human right). But as consumption increases, so does the price. The cost of the next 20,000 litres jumps dramatically, and beyond that the cost doubles again (Vital Water Graphics 2009). Tiered pricing could easily be expanded to electricity and heating fuels, which in turn could further incentivize efficiency upgrades and solar panel installations on homes.

It is not only governments that can implement significant choice edits. While businesses have mostly used choice editing to sell more products (such as cultivating planned obsolescence), companies can also design products to be longer-lasting, repairable, and, through everything from marketing and store design to shelf placement, can encourage more sustainable choices. Stores can even take a further step of only stocking sustainable goods, whether removing virgin paper products, selling only sustainably harvested forest products, or selling only sustainably sourced fishes, as many companies have now committed to do. Companies can also shift default options. For example, utilities can make renewable energy the default source of electricity for new customers, or investment companies can make a green portfolio the default, which leads customers to automatically opt for the more sustainable option (Maniates 2010).

Analyses in this report have shown that key areas where choice editing could have the most and quickest impact are food, private transport, and housing. Ultimately, considering that choice editing directly affects specific industries and product sales, it is rarely conflict-free. Choice editing strategically can help successfully navigate through the conflict, but not always avoid it. Therefore, if conflict is unavoidable, efforts to choice edit should be worthwhile. Thus, while mobilizing against plastic bags is useful, far greater impacts and quicker returns are to be seen in **severely restricting or outrightly banning high carbon-intensive consumerism**, especially where there are privatised benefits and distributed burden sharing. Private jets, mega yachts, fossil fuel investments and other domains where the polluter elite thrive while getting everyone else to pay the environmental price are examples (Textbox D). Common practices of the consumer class such as frequent flying (mileage) programs to accumulate and use miles for further flying, customer loyalty programs that encourage stays in wasteful hotels, etc., need to be seen in the context of their high climate impacts and banned (Carmichael 2019). Such a focus would have the additional advantage of not victimising low-income or sustainable groups that already have limited consumption and environmental impacts. And while outright bans may be challenging with the heavily resourced pollut-

er elite, significant taxes on such unmitigated environmentally destructive consumption options could help rein this in.

As choice editing is an effective and proven strategy, it should be applied across key sectors and sub-sectors:

number of houses owned, house sizes and insulation standards, electricity, water, and fuel usage, and so on. As Textbox C lists, there are many high-level transportation choice edits that are already being implemented to great effect.

TEXT BOX C: Examples of sustainability choice editing in transport

Phase out fossil fuel cars. A European Union proposal would ban the sale of new petrol and diesel cars from 2035 in order to address the climate crisis. The European Commission proposed a 55% cut in CO₂ emissions from cars by 2030 compared to 2021 levels (Carey and Steitz 2021). Carmaker Volkswagen has committed to stop selling combustion engine cars in Europe by 2030 (Reuters 2021).

Freeze all new road building projects. As a part of its plan to achieve net-zero carbon emissions by 2050 (Messenger 2021), the Welsh government announced in June 2021 a freeze on all new road projects. In Wales, 17% of emissions are from road vehicles. The government plans to redirect funding to public transport and maintaining current roads (BBC News 2021b).

Discourage private car use. The London Congestion Charge, which vehicles must pay in order to drive within the charge zone, reduces car traffic in central London, encourages walking, biking, and use of the public transport network. In addition, vehicles that do not meet Ultra Low Emission Zone standards must pay an additional charge to drive in further restricted zones (Transport for London n.d.).

Stop airport expansion. Plans to expand Bristol airport in the United Kingdom were rejected by councillors following concerns that it would exacerbate the climate emergency, damage the health of local people, and harm flora and fauna (Morris 2020). Similarly, in 2017 concerns that an additional runway at the Vienna airport would lead to an additional 1.79% annual increase in carbon emissions led a Austrian court to block expansion of the airport (Berwyn 2017).

Ban short haul flights. France has banned short-haul domestic flights—journeys that could be made under two-and-a-half hours—in a bid to reduce climate impacts from flying. Instead it would promote train travel, which is lower emissions per capita, as an alternative along those routes (BBC News 2021a). Similarly, Austrian Airlines replaced short domestic flights with increased train service after a government bailout (a good tool for implementing choice edits) required that it cut its carbon emissions and end flights that are under three hours and have a direct train connection (Halasz and Picheta 2020).

Keep oil in the ground. Governments of several countries, including New Zealand, Belize, Costa Rica, France, and Denmark have all enacted total or partial bans on oil and gas exploration. New Zealand has a ban on new offshore oil and gas exploration permits, and has established a “Just Transitions Unit” to support parts of the country most dependent on the oil and gas industry (SEI et al. 2019).

5.4. Assessments for choice editing

Choice editing at an economy-wide scale requires facilitation by governments and with the involvement of key stakeholders that recognise what is at stake, according to the (Sustainable Consumption Roundtable 2006). To ensure public acceptance, the objective of choice editing needs to be clearly understood, the process transparent (based on a widely recognised criteria such as a scientific approach) and be seen as fair. Developing a choice editing framework is beyond the scope of this report, however, for demonstration purposes, a number of logical and scientific assessment approaches are already widely available that can be used for a rigorous framework.

- Impact and sustainability assessments ask the question of whether we can ecologically afford the option under consideration. It applies an understanding of biophysical capacity, including planetary boundaries, limits to resources, climate change from GHG emissions to set physical thresholds below which consumption should occur—the ceiling of a fair consumption space.
- Needs and wellbeing assessments ask the question of whether products and services are necessary. Assessments can be useful to understand the utility of existing products and services, and distinguish products that satisfy needs (starting with fundamental human needs) versus wants. In a climate crisis, a luxury is any carbon emitting product or service that draws on the remaining limited carbon budget without a commensurate contribution to wellbeing or near-term opportunity for regeneration.

- Social innovation stimulates development of alternative satisfiers of needs, or identification of options that could be modified to be more sustainable.
- Cost assessments reveal whether alternative satisfiers are economically and socially affordable. Comparative costs reveal what it takes to introduce new product alternatives, modify existing options, or retire some obsolete or harmful products and services completely.

In promoting sustainable lifestyles, choice editing can be applied to edit-in desired options or to edit-out undesired ones. It can be used to edit-out unsustainable products and services (those that don't contribute to the wellbeing of environment and society—or which adversely affect them), overconsumption (consuming beyond the fair consumption space), superfluous consumption (which is neither sustainable nor unsustainable but provides no additional value and takes up resources or opportunities for others to satisfy their needs). Conversely, it can be used to edit-in sustainable alternatives to existing products or ways of meeting needs by stimulating innovation, or to ensure access to satisfiers of fundamental human needs and address under-consumption.

TEXT BOX D: The polluter elite: Recognising inequalities in consumption

Not all lifestyles contribute equally to climate change; in approaching solutions, it is important to recognise that in fact there is a “polluter elite” who hold greater individual responsibility now and historically (Kenner 2019). The polluter elite are extremely rich individuals whose net worth, lifestyle, and political influence mainly rest on wealth that is derived from investments in polluting activities. The 80 million richest people around the world are responsible for more greenhouse gas emissions from their consumption and their investments than the poorest four billion (Chancel and Piketty 2015; Oxfam 2015; Knight et al. 2017). (Their much larger carbon footprints tend to remain hidden by the political institutions’ focus on territorial or averaging per-capita emissions.) For this reason, it is appropriate that environmental policies currently under consideration, such as carbon taxes and choice editing, target the richest in their consumption (particularly luxury transport) and investments (their portfolios invested in fossil fuels and agribusiness, which are likely to have much larger greenhouse gas emissions compared to their consumption).

In order to fund the war effort and post-war reconstruction after 1945, the UK government raised taxes on income, inheritance, and luxury goods. The top marginal income tax rate went up from 75% in 1938 to 98% in 1941, and it stayed at this level until 1952; the top inheritance tax rate went up from 50% in 1938 to 65% during the war, and it increased to 80% between 1949 and 1968 (Piketty 2014). Just as in the Second World War when those with the broadest shoulders were asked to contribute the most, in order to get the expected rapid decrease in lifestyles carbon footprints, climate policy must pay attention to asymmetries in power and ensure that actions address the richest while also avoiding disproportionate effects on the poor. If the richest continue their high carbon-intensive lifestyles (as some did when they flew in private jets during national lockdowns while the majority of the population did not leave where they lived) this undermines other efforts at wider behaviour change (Newell et al. n.d.).

Issues of who holds power and profits from the fossil fuel dominated status quo must be engaged with by those seeking to promote sustainable behaviour change (Akenji 2019). Perhaps the most important area and where the role of the polluter elite has been decisive is in their political influence. In addition to their own high carbon-intensive lifestyles, the polluter elite also hold more responsibility because as decision makers they approve lobbying of governments (funding lobbyists and direct donations to political parties) to block the transition away from fossil fuels (Kenner and Heede 2021). With their wealth and access to those in decision making positions, they have contributed to lock-in the consumption options of ordinary citizens to be dependent on fossil fuels e.g. diesel and petrol vehicles, plastic packaging, coal and gas for electricity, heating, and cooking. Whilst some lower-carbon consumption options exist, overall the polluter elite have broadly been successful in trapping consumers by shaping a socio-technical context of carbon-intensive lifestyles. For example, when people want to travel, often the most accessible option (and sometimes the cheapest) is to drive a petrol or diesel vehicle. One factor, of many, for this is because the polluter elite have historically lobbied governments for fossil fuel subsidies and to build infrastructure for the fossil fuel economy (and thus deprioritize low-carbon alternatives).

While many seek options of transforming to low carbon lifestyles, additional attention needs to be on the actors blocking systemic change and individual action. The fossil fuel based global economy we live in today has been built up over centuries of choices by a range of stakeholders. To undertake the necessary phase out of fossil fuel production and use economy-wide will require identifying, discussing, and taking on the power of the polluter elite, in particular their capacity to lobby and capture governments around the world.

6 – Universal Basic Services: Social Guarantee for a Fair Consumption Space

Public services and other collective measures to meet human needs have an important role to play in identifying and realising a fair consumption space and sustainable lifestyles. They represent a form of public consumption that can be controlled democratically rather than by market forces (Coote 2021). It has been noted (in Chapter 1) that sustainable lifestyles can be ‘facilitated by institutions, norms and infrastructures that frame individual choice’ and that attention should also be paid to ‘non-economic aspects of our lives, as well as the role of factors outside the marketplace’ including policy and innovation. Therefore ensuring universal basic services is an innovative and regenerative measure that can help to achieve fair and sustainable consumption within environmental limits.

Following is a brief summary of the case for universal basic services (UBS) as part of a Social Guarantee (SG) (The Social Guarantee n.d.) designed to ensure that every individual has access to life’s essentials. The SG draws on experience of post-war welfare states, learning from their strengths and their weaknesses, and reimagines them for the 21st century. This brief piece also contributes to addressing a gap in the prevailing discourse about climate mitigation where social policy ought to be and show how social and environmental policies can be mutually reinforcing.

The concept of UBS was initially put forward as an alternative to universal basic income (UBI) as a better way of tackling poverty and inequality (Coote and Percy 2020; Institute for Global Prosperity 2017). The basic argument is that meeting human needs through public services and other collective measures is more equitable, affordable, and sustainable than simply providing cash benefits to support individual market transactions. Growing enthusiasm for UBI as a regular unconditional

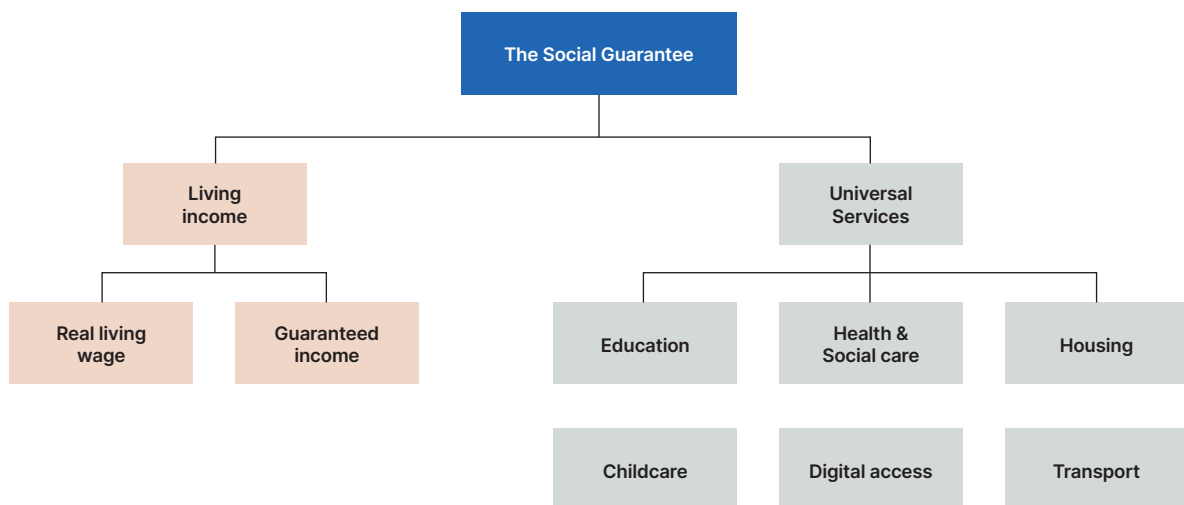
cash payment to all was seen as a threat to the collective ideal that inspired post-war welfare states—both fiscally (because anything other than a token UBI would be hugely expensive and divert funds from services) and ideologically (because UBI favours markets and individual autonomy over collective endeavour and social solidarity) (Coote and Yazici 2020). In 2021, proposals for a Social Guarantee (The Social Guarantee n.d.) brought together universal services with a fair income derived from a living wage and a guaranteed minimum income, as Figure 6.1 shows. The latter is designed to ensure that no one’s income falls below an agreed level of sufficiency. It shares the primary goals of many UBI supporters but is infinitely more affordable and compatible with UBS.

6.1. Meeting human needs

The Social Guarantee is grounded in need theory, recognising that everyone shares the same set of basic human needs that enable them to participate in society. It is argued that every individual should have secure access to these essentials, regardless of income, location, or status.

Doyal and Gough identify participation, health, and critical autonomy as basic human needs (Doyal and Gough 1991). In a similar vein, Nussbaum describes three ‘core’ capabilities: of affiliation, bodily integrity, and practical reason (Nussbaum 2001). While such needs are universal across time and space, the practical means by which they are satisfied vary widely, as norms, resources, and expectations shift and change between generations and countries. But there are certain need satisfiers or ‘intermediate needs’ that are generic and enduring. They are listed by need theorists as water,

Figure 6.1. The Social Guarantee



Source: The Social Guarantee (n.d.)

nutrition, shelter, secure and non-threatening work, education, healthcare, security in childhood, significant primary relationships, physical and economic security, and a safe environment (Miller 2012). Added to the list more recently are access to motorised transport and to digital information and communications (Rao and Min 2018).

A key feature of this needs-based approach is that it recognises limits. While wants and preferences vary infinitely and can multiply exponentially, needs are satiable: there's a point beyond which more food, more work, or more security are no longer helpful and could even be harmful. Thus, sufficiency is integral to the process of meeting universal needs. The combination of these two concepts—universalism and sufficiency—is central to the Social Guarantee.

Generic need satisfiers provide a starting point for exploring the practical implications of the Social Guarantee. So far, the focus has been on education, healthcare, housing, transport and digital access, but it could well be extended to other necessities such as food, energy, and access to green spaces.

6.2. A normative framework

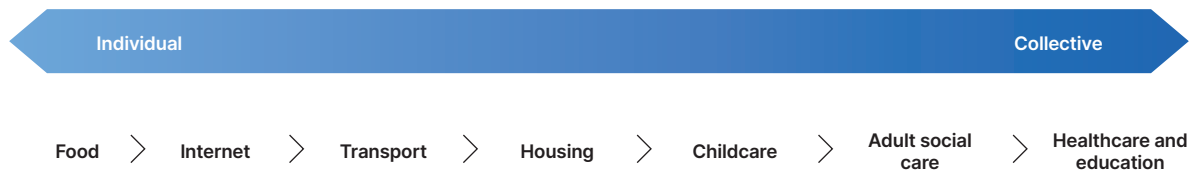
The Social Guarantee is best understood as a normative framework for policy and practice. Each area of need requires a customised approach. As Figure 6.2 indicates, some needs are typically met by individuals through direct market-based transactions while others can on-

ly be met for all by pooling resources and sharing responsibility. In all cases, collective measures—including taxation, investment, and regulation—are required to ensure that access to life's essentials is both universal and sufficient. And in all cases the same set of principles apply.

Accordingly, access to life's essentials is a universal right. Access is based on need, not ability to pay. Power in deciding how needs are met is devolved to the lowest appropriate level. Services are delivered by a range of organisations with different models of ownership and control, but all share a clear set of enforceable public interest obligations, which support collaboration and reinvestment over competition and profit extraction. There is meaningful participation in planning and delivering services by residents and service users, working in close partnership with professionals and other service workers, reflecting the model of co-production (Boyle et al. 2010). Service workers are entitled to fair pay, secure conditions, and high-quality training and career development. There are clear rules and procedures for establishing and enforcing entitlements. Last, but most important in this context, services and other collective measures to secure life's essentials are designed and delivered to promote and enable sufficiency within planetary boundaries.

Within this framework, state institutions are likely to provide some services directly—at national and local levels—where appropriate. Beyond that, they have certain key functions: to guarantee equality of access for individuals, between and within localities; to set and en-

Figure 6.2. Individual and collective means of securing life's essentials



force ethical and quality standards; to collect and invest the necessary funds, distributing them to maximise inclusion and fairness; to encourage and support diverse models of service provision and enforce providers' public interest obligations; and to coordinate activities across sectors to achieve optimal results.

It is proposed that key decisions—for example, about designing services and other measures, or about the order of priorities and pace of change—be made through a three-way democratic dialogue. This combines the experiential wisdom of lay residents with the codified knowledge of experts and the strategic and tactical insights of elected representatives. Citizens' juries and citizens' assemblies offer useful models that can be adjusted for decision-making at national and local levels, and across a range of political settings.

There are many examples from a wide range of countries that show how needs are being met collectively in ways that are fairer and more sustainable than where they are left to unfettered markets. It is impossible to do justice to them here, but details and further reading can be found *inter alia* in a briefing on 'Universal Quality Public Services' (Coote and Yazici 2020) published recently by Public Services International and on the Social Guarantee website (The Social Guarantee n.d.).

6.3. Investing in the social infrastructure

The costs of implementing the Social Guarantee will vary between areas of need as well as between countries. It will also depend on the scope and quality of measures that are introduced to secure life's essentials for all. Most OECD countries already spend significant amounts on healthcare, transport, and access to digital information. It has been estimated that the total additional annual expenditure required for the five areas of need on which the Social Guarantee is focused, if implemented all at once and provided universally, would be between 4 and 5% GDP in a typical OECD country.

To put this in perspective, both the UK and US governments increased public spending by more than 6% of GDP in 2008 to bail out private banks during the financial crisis and in 2020–21 the United States, Japan,

Germany, Italy, and France all spent more than 20% of GDP on fiscal stimulus packages related to COVID-19 (Statista 2021b). These events are not directly comparable, but they do indicate that public spending can be more a matter of political imperative than applying rules of contemporary economics.

Further research is required to calculate the net costs of universal services alongside measures to secure a living income. This would take account not only of expenditure but also of potential savings, as well as returns on the investment in social infrastructure that the Social Guarantee entails. For example, there may be economies of scale where needs are met collectively rather than individually. Enabling people to co-produce—as far as possible—the ways in which their needs are met can bring uncommodified human resources into the process: this can not only enhance the wellbeing of the individuals concerned—provided they are adequately supported—but also improve the quality and scope of the services without a corresponding increase in the overall cost. In addition, collective action to meet needs can prevent harm that would otherwise require more costly 'downstream' interventions by public services—for example, decent childcare and housing for all who need it can improve wellbeing and reduce demands for healthcare services. An analysis conducted for 74 low and middle income countries found that increasing health expenditures by just \$5 a person with a focus on preventative health measures could yield up to nine times that value in economic and social benefits including greater GDP growth and the prevention of needless deaths (Stenberg et al. 2014). No less important is the fact that public investment in universal services can generate considerable returns as discussed below.

Protagonists claim that implementing the Social Guarantee can bring substantial benefits in terms of equality, efficiency, solidarity, and sustainability. These claims are not definitive because the framework is new and untested, and there has so far been little opportunity for scrutiny and debate. There is nevertheless some evidence, drawn from studies of existing public services that support them.

6.3.1 Equality

Public services are known to reduce income inequalities by providing a virtual income or ‘social wage’, made up of in-kind benefits. For example, UK research has shown that a free childcare service would save a couple with two children more than £200 per week. This is worth much more to people in low income groups

(Davis et al. 2020). A study of OECD countries suggests that poor people would have to spend three quarters of their income on essential services (Verbist et al. 2012). Table 6.1 shows in-kind benefits—of education, healthcare, social housing, ECEC (early childhood education and care), and elderly care—as a share of disposable income per quintile.

Table 6.1. In-kind benefits as a share of disposable income by quintile, average over 27 OECD countries

	Q1	Q2	Q3	Q4	Q5	Total
Education	30.6%	18.5%	14.2%	10.4%	5.6%	11.8%
Healthcare	34.9%	22.2%	15.8%	11.8%	7.2%	13.9%
Social housing	1.8%	0.7%	0.4%	0.2%	0.1%	0.4%
ECEC	4.5%	3.0%	2.4%	1.5%	0.8%	1.8%
Elderly care	4.0%	1.9%	0.7%	0.4%	0.2%	0.9%
Total	75.8%	46.4%	33.5%	24.3%	13.7%	28.8%

Source: Verbist et al. (2012)

The 75.8% share for the lowest income quintile compares with a 13.7% income share for the highest quintile. Indeed, the study shows that inequality in OECD countries is reduced by one-fifth when the measure is extended from money incomes to a combination of money and social income (Verbist et al. 2012). Without in-kind benefits, many individuals and families would be unable to meet their needs and flourish. They are important for all families, and especially for those on lower incomes, not only directly through the services they offer (education, care, housing), but also indirectly through their preventative effects as well as improving wellbeing and a sense of security. The sense of security is also a foundation for trust, which in turn is good for social interaction, democratic relations, and the economy at large. Those who can rely on getting an education, a decent home, and care when they need it are better protected over time against accumulating risks and vulnerabilities.

6.3.2. Efficiency

Measures of efficiency in the public sector are usually complex and contested. Public services have been accused of inefficiencies, to justify introducing market rules. But privatisation, competition between multiple providers, and customer choice for service users have largely failed to improve outputs let alone outcomes. These failings have been greatly exacerbated by public spending cuts.

Non-profit, collective forms of provision avoid inefficiencies that routinely arise from market processes: inflexible contracts, higher transaction costs, and moral hazards that are encountered when profit incentives combine with unequal knowledge in markets. A non-profit system does not need to extract funds to pay dividends to shareholders.

A 2016 study compared spending on healthcare and average life expectancy in OECD countries. It found the USA, which is a mainly market-based system, outspent the UK in 2014 by the equivalent of £6,311 (\$8,000) per person, compared with £2,777 (\$3,500), yet had an average life expectancy at birth of 78.8 years, compared with 81.4 in the UK (Office for National Statistics 2016).

Calculations of efficiency must take account of the multiple dimensions of value, the many ways in which value is experienced and how it accrues. This calls for social value analysis to take account of longer-term, indirect effects across social and environmental dimensions. As noted, expenditure on UBS can be seen as an investment in social infrastructure, which can be expected to yield significant returns over time.

Social Return on Investment (SROI) is one approach that has been adopted by the UK government, which formally requires public authorities to consider whether their procurement practices ‘improve the economic, social and environmental well-being of the relevant area, and how, in conducting the process of procurement, it might act with a view to securing that improve-



ment' (Department for Digital, Culture, Media and Sport and Cabinet Office 2021). Bauwens has called for a major 'Value Shift:' instead of rewarding 'extractive' practices 'that enrich some at the expense of the others,' we should reward 'generative' practices that enrich the social and environmental resources to which they are applied (Bauwens and Niaros 2017). Building support for UBS will partly depend on redefining efficiency along these lines, by asking how far universal basic services lead to outcomes that renew local assets, safeguard planetary boundaries and nurture human flourishing.

6.3.3. Solidarity

The concepts of shared needs and collective responsibilities embody the idea of solidarity, and the Social Guarantee has potential to develop and strengthen it. Solidarity is taken to mean feelings of sympathy and responsibility between people that promote mutual support. It is an inclusive process, not just within well-acquainted groups but also, crucially, between people and groups who are 'strangers' to each other. It involves collective action towards shared objectives (Wilde 2013).

First, universal services can develop experience of shared needs and collective responsibility, which builds

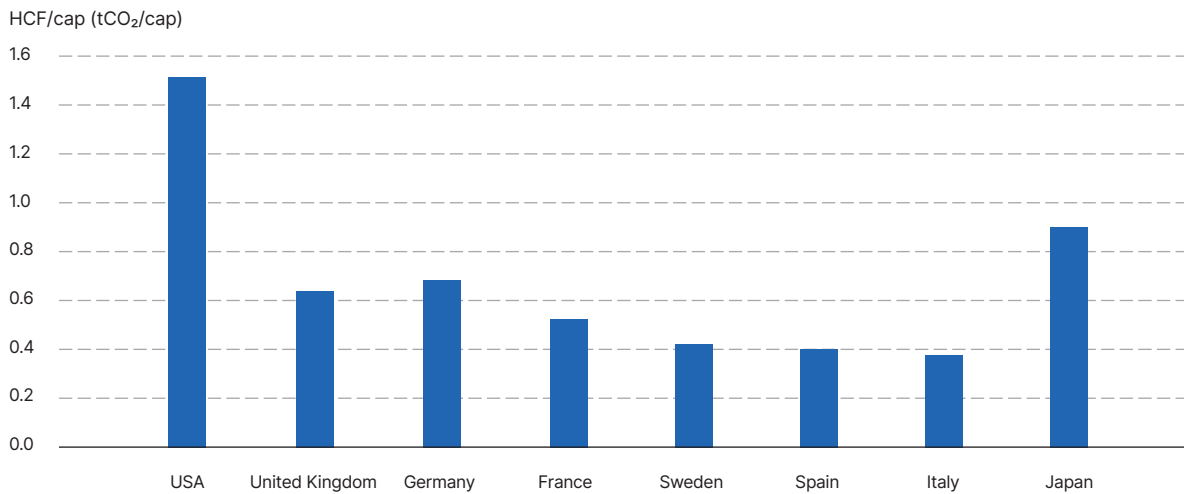
understanding of how people depend on each other and a commitment to retaining those interconnections. Second, where services bring people together from different social groups, they can provide opportunities for developing mutual sympathy and responsibility. Third, the combined effects of more and better services bring benefits to society as a whole and have a redistributive effect, reducing inequalities that otherwise create barriers to solidarity.

By contrast, there is a rich literature on the ways in which systems based on individualism, choice, and competition weaken the values of social citizenship and undermine solidarity (Jayasuriya 2006; Brodie 2007; Akenji 2019; Lynch and Kalaitzake 2020).

6.3.4. Sustainability

Sustainability involves, at its simplest, an inherent 'capacity for continuance', as Ekins observes: a sustainable system is one that can function in ways that continue to achieve its desired goals over time (Ekins 2014). Universal services have the potential to affect this capacity through prevention of harm, through economic stabilisation and through helping to mitigate climate change and the depletion of natural resources. The urgent ne-

Figure 6.3. Health carbon footprints per capita, selected countries, 2014



Source: Pichler et al. (2019)

cessity to move away from unsustainable economic, social, and environmental practices provides a new justification and impetus for extending universal services.

As noted, collectively provided services that help people to stay well and flourish are directly beneficial to individuals and society; they can also reduce demand for a range of services required to cope with problems that are otherwise likely to occur. For example, unemployment, anti-social behaviour, and many forms of crime, have roots in poverty and deprivation, which can be significantly reduced by a more generous 'social income'. By helping to maintain and improve social well-being, services can not only support the capacity of society to continue to flourish; they can also prevent harm and thereby mitigate the risk of services becoming overwhelmed by rising demand, enabling them to continue to function effectively (Gough 2013).

Where the economy is concerned, public services can help to stabilise fluctuations by generating relatively stable employment and providing security through meeting everyday needs. In these ways, they can act as a counter cyclical buffer, helping to offset the effects of market downturns and recession, contributing to the economy's 'capacity for continuance.'

A move towards more and better public services is considered likely to prove more environmentally sustainable than leaving the process of meeting needs to transactions in a market based system. There are three main reasons for this. First, the Social Guarantee framework focuses on sufficiency for all, rather than on satisfying wants and preferences, which can escalate without constraint. This helps to put a brake on excessive

consumption that would otherwise threaten to breach planetary boundaries.

Second, by promoting collective action to pool resources and share risks so that everyone's needs are met, the Social Guarantee can play a part in changing attitudes to economic success—by favouring a concern for human wellbeing within planetary limits rather than simply focusing on GDP growth.

Third, provisioning systems that are democratically controlled with the purpose of serving the public interest have greater potential than market-based systems to promote sustainable consumption, as there is no built-in imperative to increase production and consumption. Through their networks of employees, service users, and suppliers, they can coordinate sustainable practices such as active travel, resource-efficient buildings and local food procurement, avoid duplication and waste, minimise excessive demand, and implement national strategies for reducing GHG emissions. Where governments issue guidance, public sector organisations are more likely to comply because they share public interest values. Where public bodies work with non-governmental partners or subcontractors, they can spread sustainable practices among a wider range of institutions.

There is evidence that collectively provided services have a smaller ecological footprint than privately funded alternatives. For example, the per capita carbon footprint of healthcare in the USA is two and a half times greater than in the UK and three and half times greater than in several European countries (see Figure 6.3).

Finally, public services can play a vital role in decarbonising the economy in a just way. For example, Green

New Deal programmes to retrofit the vast bulk of the housing stock will require public planning, finance, and management. They will be needed to ensure a 'just transition' to lower carbon living, rather than one that will load costs onto the poorest people and communities.

6.4. Conclusion

To conclude, the Social Guarantee is a principled framework that seeks explicitly to contribute to creating a fair consumption space in ways that are summarised briefly below.

First, the Social Guarantee puts collective (or public) consumption on the agenda, alongside individual (or private) consumption, as a site of efforts to achieve a sufficient social foundation for all, to avoid breaching planetary boundaries, and to constrain excessive—and unnecessary—consumption. It involves consumption through expenditures on goods and services by a wide range of social and public institutions at national and local levels. Hospitals, schools, and prisons are obvious examples.

Second, it aims to support a sufficient level of consumption for all through an enhanced 'social income'. It offers benefits in kind, according to need, not ability, to pay, that are intended to enable everyone to have secure access to life's essentials. This the most obvious and substantial way in which the Social Guarantee can contribute to maintaining the social foundation that constitutes the lower boundary of a fair consumption space for sustainable lifestyles.

Third, the Social Guarantee embodies an ethos of collective responsibility and a needs-based approach to human welfare, based on sufficiency. As such, it offers a robust framework for policy and practice that is closely aligned with the goal of living well within limits. It seeks to build solidarity and mutual support among people and groups in ways that cannot be achieved by systems based on market transactions alone. By encouraging an awareness of interdependence and developing practical experience of collective responsibility, it can help to create favourable conditions for society to play a pivotal role in imposing limits on individual freedom to consume more than is required to live a good life (Fuchs 2019).

Fourth, as noted above, the SG framework can influence provisioning systems so that they remain within ecological limits. Inherent in the framework is a stipulation that all organisations that receive public funds to provide universal services, providers subscribe to public interest obligations that include the requirement to cut emissions and safeguard natural resources. Also inherent is the national allocation of resources to local and regional authorities to ensure equal access to services

between different areas and population groups. This offers a vehicle for shaping the practice of organisations involved in delivering services and for influencing consumption patterns of people using services. For example, a free bus service can discourage other, more energy intensive forms of travel; housing policies can be designed not only to create zero-carbon homes made from renewable materials, but also to encourage residents to change patterns of consumption and tread more lightly on the planet; childcare services can be organised and run in ways that raise awareness about sustainable consumption, and encourage and support it in practice.

Fifth, the UBS framework can help to constrain excessive consumption by changing incentives and redirecting resources. If collective provisioning became an acceptable—even popular—way to secure much of what is necessary to live well within limits, norms and expectations would shift, influencing what people want to buy, how much is considered 'enough' and awareness of the negative effects of accumulating too much stuff. Financing UBS requires higher taxation, unless debt rises. Even where a tax system is proportional rather than progressive, higher disposable incomes are likely to be brought below the level they would otherwise be, reducing luxury consumption (all else being equal). Comparing two countries, with high and low provision of public services but with similar total consumption, the extent and share of high-end consumption above any ceiling would be lower in the former country.

Finally, it is important to stress that the Social Guarantee is not a single policy lever but a proposed route for policy making across a range of different areas. That route is shaped by distinctive values, favouring collective action to meet shared needs now and in years to come. How far these proposals are able to fulfil their promise depends on how services are devised, organised and funded, where power lies, models of ownership, how people participate, conditions of eligibility, and how entitlements are realised. The Social Guarantee agenda can be introduced incrementally, but its ambitions go well beyond piecemeal reform. It is essentially about changing whole systems to achieve a sustainable future.

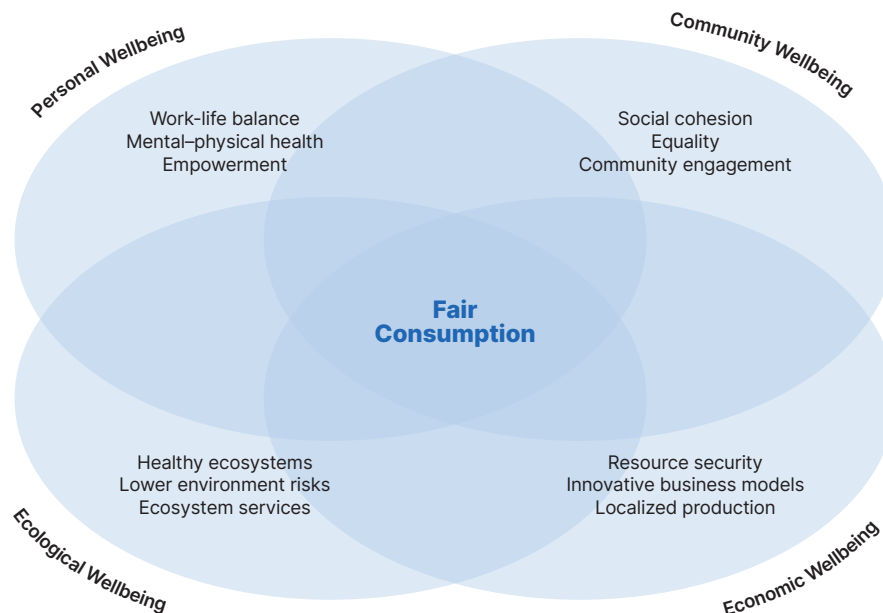
TEXT BOX E: Wellbeing: linking sustainable lifestyles, climate change, and health

Achieving the 1.5 °C target of the Paris Agreement and transitioning towards a fair consumption space will not only reduce the impacts and costs of climate change (IPCC 2018), it will also bring about improvements in quality of life including on physical and mental health, the quality of social relationships, interpersonal trust, work-life balance, empowerment, community engagement, and on many other levels.

Widespread adoption of 1.5-degree lifestyles requires an economy that prioritises human and ecological wellbeing over growth, and that recognizes, protects, and promotes the contributions of natural, social, and human capital to collective wellbeing. Achieving a fair consumption space for sustainable lifestyles means reducing both within- and between-countries inequalities by tackling over- as well as under-consumption. While, on the one hand sustainable lifestyles entail a radical change in the ways we satisfy our needs (Akenji 2019), on the other hand they entail consuming better, and living a healthier life in more equal societies that nurture participation, dignity, human connections, fairness, and ecological wellbeing.

Multiple Co-benefits

Figure E.1. Co-benefits of adopting 1.5-Degree Lifestyles



Achieving a fair consumption space could bring about a number of co-benefits in terms of increased personal, community, ecological, and economic wellbeing.

The quality of human relations and the living environment are both fundamental determinants of a person's health (European Environment Agency 2018). Continuous material growth and overconsumption are not only responsible for rising greenhouse gas emissions but also have detrimental impacts on social cohesion and psychological and physical wellness. Inequalities, psychological distress, anxiety, depression, narcissism, reduction of empathy, and other mental disorders are on the rise in modern societies (Friedli 2009; Botezat et al. 2017; Carod-Artal 2017; Macintyre et al. 2018). Growing inequalities have a negative bearing on personal and collective health outcomes, while greater equality affects many dimensions of wellbeing, from child development to life expectancy, from declining violence to improved social cohesion and interpersonal trust (Kasser 2003; Wilkinson and Pickett 2011). Care-based and trust-based activities, often voluntary, have a fundamental impact on societal wellbeing (Helliwell and Putnam 2004), and high levels of social capital are linked to collective action and more resilient societies.

Studies show how levels of physical health and life expectancy are lower in more economically unequal countries (De Vogli et al. 2005; Pickett and Wilkinson 2015). A meta-analysis of 29 studies, including about 60 million participants in total, found that people living in regions with high income inequality have an excess risk of premature mortality and poor self-rated health, with a 0.05 unit increase in the Gini coefficient linked to an 8% excess mortality risk (Kondo et al. 2009). In industrialised countries, reduction of income inequality was likely to be more effective in lowering infant mortality rates than further increases in Gross National Product per head would be (Hales et al. 1999).

There is an established link between economic inequality and rates of violence, property crime, and violent crime. For example, (Fajnzylber et al. 2002) show how a small permanent decrease in inequality—such as reducing inequality from the level found in Spain to that in Canada—would reduce homicides by 20% and lead to a 23% long-term reduction in robberies.

Countries with higher levels of income inequality tend to have lower levels of education and social mobility (Corak 2016). Lower scores in maths and reading are found in more unequal countries (Wilkinson and Pickett 2009).

Studies show that people in European countries with higher levels of inequality are less likely to help each other (Paskov and Dewilde 2012), and that higher income inequality is linked with lower levels of voter turnout (Geys 2006; Solt 2010, 2008), lower rates of social and civic participation, and lower political engagement (Lancee and Van de Werfhorst 2012).

Wellbeing benefits of fair consumption

A 1.5-degree world is a world with little or no space for inequality. Societies enabling, mainstreaming, and adopting 1.5-Degree Lifestyles within a fair consumption space can only do so in a context of reduced inequalities and increasing collective wellbeing. The co-benefits of 1.5-Degree Lifestyles are many.

Regarding food, the adoption of sustainable diets with reduced consumption of meat not only reduces personal carbon footprints, it is also healthier and linked to lower mortality rates, higher life expectancy, and lower risks of developing heart diseases and diabetes (Willett et al. 2019). For example, one study following more than 200,000 people from three different cohorts for up to 30 years, reported an increment of about 35 grams/day of red meat as associated with a significant 6% increase in risk of type 2 diabetes (Pan et al. 2011).

Regarding transport, reducing private transport in favour of shared, public, and more sustainable transport modes not only reduces carbon footprints, it also reduces air pollution

and encourages active modes of transportation, such as cycling or walking, with numerous benefits for mental and physical health, reduced stress and anxiety, and which increase sense of place and social connectedness. For example, (Requia et al. 2018) estimated that PM 2.5 emissions during congestion periods in the Greater Toronto and Hamilton Area have an impact of 119 to 206 deaths per year. These findings are consistent with other existing studies in international literature (Levy et al. 2010; Zhang et al. 2011), and call for transitioning to more sustainable mobility options.

A better work-life balance, for example introducing a 4-day work week, has benefits in terms of better personal health, quality of work, it frees up time for family care and helps adopting healthy lifestyles, all of that while reducing carbon footprints (Knight et al. 2012; Kossek et al. 2014; Lunau et al. 2014). Shorter and less frequent commuting also leads to health benefits (Requia et al. 2018), lowering the demand for carbon-intensive healthcare products and services. Avoiding the stress and anxiety of a traffic jam is also good for mental health (Higgins et al. 2018), especially among women (Sandow et al. 2014).

Business innovation

Adopting 1.5-Degree Lifestyles also provides economic benefits through improved resource security and by opening business opportunities and redefining the role of consumers. Business opportunities emerge through the innovations that could serve as enablers for 1.5-Degree Lifestyles, such as peer-to-peer models, open-source software and hardware, 3D printing, block-chains, precision agriculture and decentralised community-based renewable energy systems (microgrids). Participatory models, where users play an active role in the design and manufacture of products and services, are also proving effective in helping developing countries to transition towards a more sustainable and wellbeing-centred way to meet some basic needs, for instance in the production of renewable energy. For example, by late 2014, an estimated 30% of the global cumulative installed capacity of PV in India was owned by private residents, “prosumers” both consuming and producing electricity (Martin and Jairaj 2016).

By localising and customising production and consumption, business innovation can promote shorter value chains and local empowerment, providing economic opportunities for multiple forms of entrepreneurs while reducing overproduction and waste of resources (Fioramonti 2020).

Finally, climate change mitigation through adopting 1.5-degree lifestyles contributes to tackling deforestation, habitat fragmentation and loss, and other concurrent causes of climate change, biodiversity loss, environmental degradation, and the emergence of pandemics (Jones et al. 2008; Faust et al. 2018; Gibb et al. 2020) and animal-borne infectious diseases such as Ebola (Redding et al. 2019). Climate change impacts ecosystems and ecological wellbeing, affecting crop and seafood production (Nelson et al. 2013), drinking water provision, ecosystems’ “protective” services from floods and coastal storms, as well as other key contributors of nature to our lives (Pörtner et al. 2021).

Overall, by activating policy, innovation, and other enablers for behavioural change, the 1.5°C target of the Paris Agreement can be potentially achieved (IGES et al. 2019). At the same time, a 1.5-Degree society in a fair consumption space would be one of increased personal, community, ecological, and economic wellbeing with reduced inequalities, better mental and physical health, functioning ecosystems, lower environmental risk, and higher resource, food, and water security.

7 – Sufficiency: How Much is Enough to Stay Below 1.5°C?

7.1. Understanding the sufficiency concept

Sufficiency is defined as a set of policy measures and daily practices that reduce the demand for energy, materials, land, water, and other natural resources, while delivering a decent living standard for all within the planetary boundaries (Shaheb, n.d.)—decent living standard being a set of essential material preconditions for human wellbeing, which includes housing, nutrition, basic amenities, healthcare, transportation, information, education, and public space (Rao et al. 2019).

Sufficiency is not a new concept, its root goes back to the Greek word “*sôphrosunê*”, which was translated in Latin to “*sobrietas*”, in a sense of “*enough*” (Cézar and Mourad 2019). The sufficiency concept was introduced to the sustainability policy debate by (Sachs 1993) and to academia by (Princen 2003). With the adoption of the Paris Agreement (United Nations 2015) and the collective failure in curbing global greenhouse gas emissions after three decades of climate mitigation policies (Stoddard et al. 2021), sufficiency is emerging as a climate mitigation strategy to compensate for the unsuccessful efforts of efficiency and limitations of individual behaviour agency in reducing energy demand and its related environmental impacts.

Sufficiency addresses how lifestyles can be sustainable within a fair consumption space. The remaining carbon budget, and its normative target for distributional equity, is the upper limit of sufficiency, while requirements for a decent living standard define the minimum level of sufficiency. By limiting the over and under demand for energy, materials, land, water, and other resources, sufficiency is likely to become, in the current decade, central to the global climate mitigation strategy (Shaheb n.d.). In fact, the untapped sufficiency potential will contribute to address the unprecedented and ur-

gent transformation of the global economy and to limit the unequivocal role of human activities in global warming (IPCC 2021b).

Sufficiency is often conceptualised by contrast to efficiency. The latter is about the continuous short-term marginal technological improvements which allow doing more with less in relative terms without considering the planetary boundaries, while the former is about long-term actions driven by non-technological solutions (i.e. land use management), which consume less in absolute terms and are determined by the biophysical processes (Princen 2003). The focus of sufficiency is on human needs and the services required for human wellbeing (i.e., housing including thermal comfort, food, and personal transport) while the focus of efficiency is on human wants such as products and commodities (buildings, cars, appliances, and energy). In that sense, efficiency is a supply-side strategy while sufficiency is a demand-side one.

Sufficiency questions the current approach to climate change mitigation, such as the promise of the technological breakthrough over lifestyle changes, behavioural change of individuals over systemic change of the economy and the organisation of the society, the cost-benefit analysis over the biophysical reality of the planet, and the market-based instruments over redistributive ones (Akenji 2014). Moreover, sufficiency confronts the dominant discourse, which puts emphasis on trivial actions such as temperature set points and the over-reliance in the technological improvements driven by efficiency, which substitutes one technology with another and thus, increases the demand for materials and their related embodied energy and carbon. Unsurprisingly, sufficiency is perceived as controversial by the wealthiest consumers as it challenges their carbon-intensive lifestyles, requires changes in their consump-

tion patterns and puts an indisputable cap in their consumption levels based on the remaining carbon budget to avoid the overshoot of the 1.5°C temperature target. Sufficiency, however, also includes ensuring that people have ‘enough’ not to suffer from underconsumption but takes into account that everyone has to have enough for a decent living standard.

Sufficiency principles include the moderation of the speed to enjoy life, the reduction of distances between suppliers and consumers to avoid the ecological breakdown, the limitation of trade to focus more on commons as well as the limitation of goods’ ownership (Sachs 1993). Implementing sufficiency principles requires i) structural changes to moderate the demand for energy, materials, land, water, and other resources as well as ii) flexibility to allow for developing user-ship of services and for adapting the size and the use of goods and infrastructures to evolving human needs (NégaWatt 2003).

7.2. Sufficiency practices

As described in the section below, by considering an equal distribution of the remaining carbon budget for the 1.5°C temperature target as an upper limit, sufficiency requires a metamorphosis in the way human needs (i.e. housing, personal transport, and food) are fulfilled.

7.2.1. Food

Meat consumption and dairy products are the two major contributors to greenhouse gas (GHG) emissions identified in this report. Dietary changes will have a significant impact on limiting the overshoot of the 1.5°C target, especially in countries with carbon-intensive cuisines. Avoiding animal-based products in industrialised countries would reduce food related emissions by more than 50% (Hallström et al. 2015). However, policies have primarily focused on increasing production of organic food (which is also important) and not on reducing carbon-intensive food.

An integral food perspective, which includes prolonging the lifespan of food through better planning, purchasing, storing, cooking, and managing the leftovers is also among the strategies highlighted in the literature to reduce food waste and losses and consequently their related emissions (Roodhuyzen et al. 2017). At a global level, about one-third of food produced for human consumption is lost or wasted. This is equivalent to 1.3 billion tons per year. The highest food lost or wasted is observed in industrialised countries with an annual total of 95–115 kg/capita compared with 6–11 kg/capita in developing countries (Gustavsson et al. 2011).

7.2.2. Housing

The continuous increase of floor area per capita experienced in industrialised countries is a hidden driver of emissions from the built environment at the construction and the operation stage (Lamb et al. 2021). Applying sufficiency principles to housing requires putting a cap on the per-capita floor area. This cap could be achieved by downsizing dwellings through cohousing strategies by clustering apartments when existing buildings are renovated and by prioritising multi-family buildings over single-family homes in new developments or incentives to move ‘empty nests’ when household sizes are shrinking (Wilson and Boehland 2008; Stephan et al. 2013; Sandberg 2018). The cap on the per-capita floor area will have a direct impact in reducing the demand for materials in the construction phase and energy demand for heating, cooling, and lighting in the use phase (Heinonen and Junnila 2014). Less space also means fewer appliances and equipment and changing preferences towards smaller ones (Aro 2020).

Cohousing strategies provide users, in both new and existing buildings, a shared space (i.e. for laundry, offices, guest rooms, and dining rooms) to complement their private space, thus reducing per capita consumption of resources including energy, water, and electricity (Klocker et al. 2016), while offering social benefits such as limiting loneliness of elderly people and single parents (Riedy et al. 2019). Senior cooperative housing communities and ecovillages are considered among the cohousing examples to scale-up (Kuhnhehn et al. 2020).

Local authorities have an important role to play in the metamorphosis of housing by proposing communal spaces to be shared (Marckmann et al. 2012) through urban planning and land use policies (Newton et al. 2017). This can encourage intergenerational cohousing as well as interactions between people with different social backgrounds (Williams 2008) or spark the establishment of sufficiency consultancy services to citizens (Spangenberg and Lorek 2019). Progressive taxation based on a cap in the per-capita floor area is also needed to adapt the size of dwellings to households’ needs (Murphy 2015; Cohen 2021).

7.2.3. Mobility

Over the last three decades of climate mitigation policies, emissions from mobility have increased in all countries (Lamb et al. 2021) driven by the expansion of the use of private cars due to urban sprawl, the lack of public transport, as well as the social and financial incentives to become a car owner. Sufficiency practices to reduce emissions from mobility include living car-free, ride sharing, reducing the travelled-distances, the weight of private cars, and speed limits (Bigo 2020). However, the focus of policies and research has been mainly on

changing the behaviour of individuals through car sharing instead of ride sharing (Chen and Kockelman 2016) and on making mobility smarter (Marsden et al. 2014; Barr 2018). The contribution of structural changes to reducing emissions from mobility through new cycling and walking infrastructure, ride sharing, and safe and friendly public transport (Hasselqvist and Hesselgren 2019) are rather neglected in both policies and research.

Air travel and its related emissions have also increased in the last three decades (Gössling and Humpe 2020), especially with the increased offers for low-cost flights and leisure as well as the variety of frequent flyers' benefits. More recently, there has been an increasing focus on avoiding air travel with the flying shame movement. Using other modes of transportation and slowing travel to rediscover trips' enjoyment are among the sufficiency practices to reduce emissions from air travel, which are estimated at 1.6 tCO₂e/capita saved per roundtrip transatlantic flight (Wynes and Nicholas 2017).

Applying sufficiency principles to mobility requires framing mobility as a service to be provided within the limited per-capita carbon budget to avoid the overshoot of the 1.5°C temperature target. Urban planning and land use policies (Duffy 2009) play a major role in triggering or avoiding the daily travelled distances. High density, multi-functional areas, teleworking, as well as progressive taxation of frequent flyers and owners of multiple cars and private jets are among the sufficiency solutions to limit emissions from mobility.

Using other modes of transportation and slowing travel to rediscover trips' enjoyment are among the sufficiency practices to reduce emissions from air travel, which are estimated at 1.6 tCO₂e/capita saved per roundtrip transatlantic flight.

7.2.4. Other (consumer goods and services)

Similar strategies are suggested in the literature for products and goods (Freudenreich and Schaltegger 2020). Increasing the lifespan of products and goods by penalising planned obsolescence as well as moving from a linear use of materials and products to a circular one by reducing, reusing, recycling, and producing locally will reduce emissions from goods. Moving from ownership of products to usership of services (Grubler et al. 2018) as well as a slowing down their use (i.e. Slow fashion (Joyner Armstrong et al. 2016)) are also among the sufficiency practices to consider.

7.3. Sufficiency levels in climate mitigation scenarios aiming at 1.5°C temperature target

The contribution of sufficiency practices in mitigating climate change is hardly captured in global mitigation scenarios due to the underpinning modelling methodologies, which do not capture climate change uncertainties and irreversible changes. The most influential climate mitigation models are driven by i) the narrow techno-economic rationality (Wilson et al. 2020), ii) the technological over-optimism and reliance in unproven supply side solutions with high uncertainties (Larkin et al. 2018), iii) the price signal, iv) the cost-benefits modelling approach and v) irrational faith in the "free" market to mitigate climate change. These mathematical characterisations on which the most influential models are built are growth-based, leading to prioritising climate unfriendly actions such as creating and/or sustaining jobs in carbon-intensive industries considered cost-effective in the short-term. Overall, scenarios based on influential models do not capture the complexity and diversity of the long-term climate change damages, which are considered as externalities translated into social costs that can be internalised using carbon pricing to have the market correct its failures.

Since the adoption of the Paris agreement (United Nations 2015), new scenarios based on sufficiency principles are emerging. The Decent Living Energy (DLE) developed by (Millward-Hopkins et al. 2020) and the Low Energy Demand (LED) developed by Grubler et al. (2018) have pioneering innovative modelling approaches. The former is based on a bottom-up modelling approach while the latter combines both bottom-up and top-down modelling approaches. The LED scenario is the only known scenario delivering on the 1.5°C target without negative emissions (Grubler et al. 2018). Global final energy demand in LED by 2050 is estimated at 245 EJ, which is 40% less than in 2018. On the other hand, the DLE, with its radical demand-side changes driven by sufficiency principles, projects global final energy consumption to be at 149 EJ by 2050. Importantly, both scenarios assume a convergence between the global North and the global South in the fair consumption of space. However, the DLE scenario considers a much lower use of space for all (Table 7.1).

Table 7.1. Sufficiency levels in 2050 for selected services in scenarios based on the sufficiency principles

Well-being dimension	Sufficiency level per service required	Unit	Low-energy demand scenario (LED) (Grubler et al. 2018)	Decent Living Energy (DLE) scenario (Millward-Hopkins et al. 2020)
	Floor area per capita	m ² /cap	30	15
	Housing energy demand in the use phase	GJ/cap	1.2–5	0.6–1.1
	Housing thermal comfort (Heating)	kWh/m ² /yr	21	10.4–12.9
	Housing thermal comfort (cooling)	kWh/m ² /yr	21	10.4–14.1
	Nutrition	GJ/cap/yr	NA	3.1–3.3
	Mobility services	passenger-km/cap	9,544–17,117	4,900–15,000

Models and scenarios play an incredibly important role in decision-making. Innovative modelling frameworks, such as the ones used for the LED and DLE scenarios, show that different pathways to decarbonise the global economy are possible. By considering the planetary boundaries, they both allow for a convergence and a fair consumption of space and use of resources between the global North and the Global South. The 1.5°C target requires an innovative modelling framework to break the existing silos inherited from the disciplinary specialism and the theoretical frameworks that have led to increasing emissions during the last three decades of intensive climate mitigation policies.

8 – Has the Time Come for Carbon Rationing?

8.1. Rationing: a socially just response to the climate crisis

New policies that address calls for climate justice and concerns about equity are needed. One policy approach that could resonate with these calls is carbon rationing. Personal carbon rationing²³ is a policy concept that aims to fairly reduce carbon emissions by targeting end-users and by focusing on the contribution of individuals' choices to global emissions. Carbon rationing also recognises individuals as citizens with a moral responsibility to contribute to protecting current and future generations from the climate crisis. It is based on the premise that climate change is a threat to society and therefore mitigation is a shared societal responsibility that should engage all members of society in a way that reflects their impact. It is both collective and individual, promoting society-wide and individual change, and making explicit links between global environmental limits and personal actions.

Carbon rationing is relevant for two main reasons: first, existing policies and programs are insufficient for meeting carbon reduction targets, and second because it meets calls for socially just action on climate change.

8.2. Carbon rationing as an idea

Rationing is usually introduced to control access to a scarce resource. It serves the double purpose of preventing overexploitation of the resource and ensuring

that everyone has access to meet basic needs. 'Carbon rationing' is shorthand for rationing the right to emit carbon emissions where the scarce resource is the limited cumulative global greenhouse gas emissions budget if catastrophic climate change is to be avoided. The resource in this case is somewhat abstract, scientifically defined, and politically negotiated, and unconnected to people's everyday experiences. This makes it different from other rationing schemes in very important respects. However, the principles are the same, and there can be relevant lessons from historic and current rationing policies.

8.3. Contemporary and historical resource rationing

Rationing of individual access to services or resources is used in a variety of contemporary contexts, including road space rationing (Victoria Transport Public Institute n.d.) and water rationing (Enqvist and Ziervogel 2019). Rationing may be in response to a short-term emergency—either of shortage or unacceptable impacts of continued consumption—or as a longer-term policy. For example, 'load shedding' is a form of electricity rationing when power is cut to parts of the electricity grid for a limited time to avoid wide scale blackouts. This is used regularly in developing countries with inadequate electricity systems (Hashemi 2021), but also occasionally in industrialised countries, particularly in re-

23 Rationing individuals' carbon is an idea which has been discussed under a variety of names and different scheme designs: personal carbon trading, rations, allowances, budgets, quotas, individual carbon allowances, tradable energy quotas. The most common policy names in the academic literature are 'personal carbon allowances', PCA, and 'personal carbon trading', PCT. Here we use the language of rationing when referring to the general concept and PCA or PCT when referring to a specific policy.

Carbon rationing also recognises individuals as citizens with a moral responsibility to contribute to protecting current and future generations from the climate crisis.

sponse to extreme weather events (e.g. in Texas in 2021 in response to winter storm damage to the network (IEA 2021)). Thus, rationing is part of the toolbox available to today's public policy makers but, for many it is more associated with experiences in the Second World War.

During the Second World War years (1939–1945), some degree of food control and rationing operated in almost every country in the world. The British food scheme, for example, rationed meat, cheese, fats, sugar, and preserves in fixed quantities per head. Additional schemes were superimposed on this common basis to meet particular needs, e.g. extra protein, vitamins, and minerals were provided to children of preschool age, and nursing and pregnant mothers (Burnett 1989).

Food rationing in the UK, coupled with subsidies and price controls, promoted greater social equality, and consumption became more equal in contrast with the intense inequalities that existed previously. Despite difficulties, contemporary opinion polls showed that rationing and food control were on the whole popular and discontent was eclipsed by general satisfaction (Zweinger-Bargielowska 2000).

Reflecting upon three years as UK Minister of Food during the Second World War, Lord Woolton believed that “the success of any rationing scheme depends, in the long run, on two things; the first is its justice and impartiality, and secondly—and perhaps the more important factor—on the general public acceptance of the correctness of its purpose and the fairness of its administration.” The UK government took great pains to convince the public that rationing was necessary and temporary, explaining the economic case and invoking popular memory of the success of rationing during the previous war (Roodhouse 2017). The evidence is that the political and public acceptability of rationing policies is not determined solely by the policy design, its benefits and disbenefits, and its place within the broader policy landscape. It is also about how these are communicated and understood.

TEXT BOX F: Carbon rationing in the UK

Early carbon rationing research was predominantly carried out in the UK, and it is also the UK where the idea came closest to adoption by the government in 2007/08. However, despite initial high-level interest by the Environment Minister, after further government-commissioned research, it was declared to be an idea ‘ahead of its time’ (Defra 2008). Subsequent support from parliamentary committees and other influential bodies did not receive government interest in the idea (Fawcett and Parag 2010). There are different perspectives on why this was the case. The commissioned research certainly showed serious challenges with turning this idea into a policy—with high costs and concern about public acceptability of the idea being key barriers. However, it is also notable that at that time there were only a handful of published academic articles on personal carbon trading; there was almost no evidence base from which to examine the ideas as a potential policy. Similarly, there was no significant civil society knowledge of or support for the idea. Arguably this idea had its moment in the political spotlight too soon in its development.

A recent study analyses carbon rationing policies using the multiple streams approach, which defines criteria that a policy proposal must meet to become part of the political agenda (Bothner 2021). It concludes that personal carbon trading will only move out of the ‘policy primeval soup’ when many researchers, practitioners, and politicians support the idea. A bright idea is not enough.

8.4. Policy design

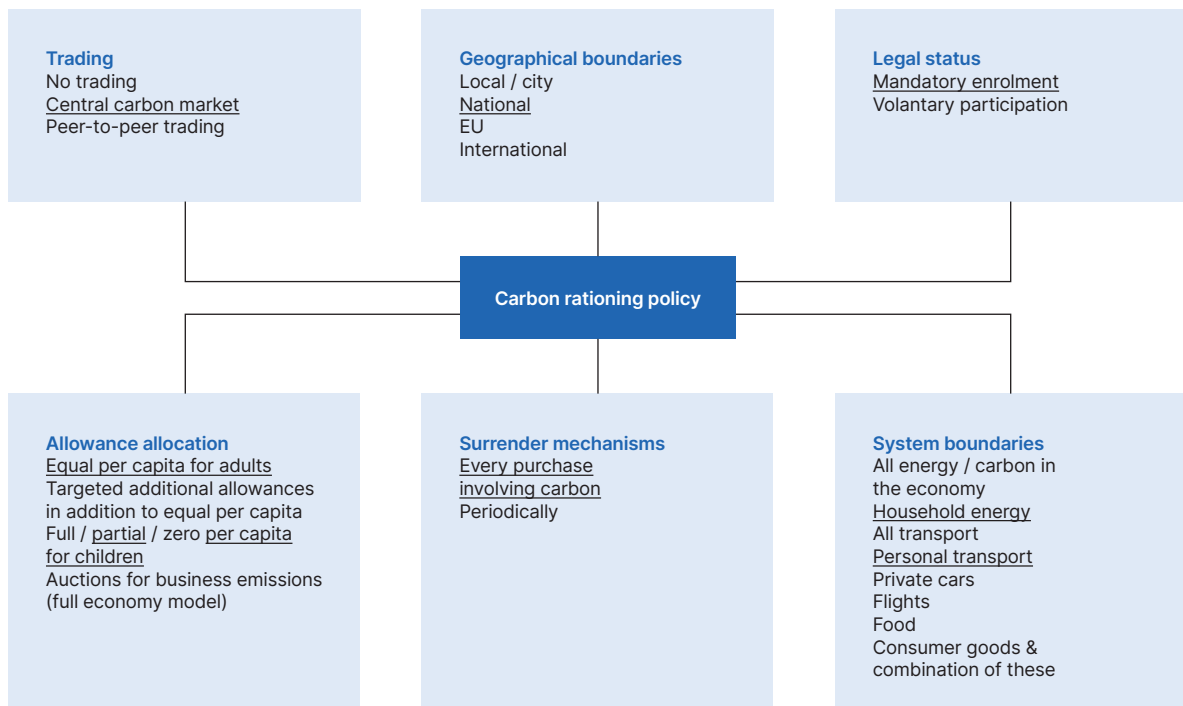
Several different policy proposals based on the idea of rationing or personal carbon trading have been explored. The policy design elements which attract most debate are the scheme boundaries, i.e. which economic sectors/activities are covered, how allowances are allocated (including whether an equal per capita allowance is fair), and whether trading in allowances is possible. Figure 8.1 illustrates key design decisions, which are combined to form a carbon rationing policy.

Other decisions not illustrated here include the monitoring and enforcement systems, obligations on various parties involved in the carbon system, what happens if the carbon price becomes unacceptably high—these issues are explored in Eyre (2010). Also important is the technology used to operate the policy (Fuso Nerini et al. 2021), lifetime of allowances and surrounding policies.

Critically important too is the rate at which personal allowances reduce over time—whether by a fixed percentage per year, fixed amount per year, or more slowly initially and then ramping up.

The combination of choices underlined in Figure 8.1 relate to a mandatory scheme, at a national level, with equal per capita allowances for adults and partial allowances for children, which covers household energy use and personal transport, and where allowances are tradable²⁴. While many different combinations of scheme attributes can be chosen, we use this version of carbon rationing for illustration purposes, and call it personal carbon allowances (PCA). It is very similar to that proposed in the early literature on carbon rationing (Hillman and Fawcett 2004), and shares important characteristics with others proposed, trialled and studied, particularly the focus on direct uses of energy, the inclusion of trading, and equal per capita allowances.

Figure 8.1. Key design elements of a carbon rationing policy, underlined choices are those combined in a Personal Carbon Allowances policy



24 It is possible to have a carbon rationing system without personal carbon trading, or with limits to what can be traded. In this regard, one approach to a more socially just rationing system is having merit goods or base amounts of goods that cannot be traded. Given the potential for trading to prey on inequalities between the rich and the poor, perpetuated by unregulated markets, a mechanism for exchange would need to be carefully thought through for a successful carbon rationing approach.

To explain briefly these key design choices:

Focus on direct energy use: In 2018, 93% of global anthropogenic carbon was emitted from use of fossil fuel energy. In the same year, 76% of all greenhouse gases²⁵ was from fossil fuel energy (Climate-watch 2021). A significant share of emissions result from energy-use decisions made by individuals, such as electricity use, heating and cooling, as well as land and air travel choices. Most literature on personal carbon rationing proposes schemes covering direct uses of energy—either household energy and personal transport emissions, or just personal transport. It is considerably more difficult to create a system which includes embedded energy in terms of, for example, food, due to the difficulty of calculating accurate carbon footprints for such products.

Trading: With trading, those with low carbon footprints would have spare carbon units to sell, and those with high emissions would need to buy additional units when their allowance runs out. The high-polluter pays while the low-polluter is rewarded. Trading provides an economic incentive to reduce personal emissions, but, more importantly, it provides a mechanism for people to adjust to the impact of a fixed and reducing allowance (for more details see Text box G).

Equal per capita allowances: Simply, this is a demonstrably fair starting point for distributing access to this scarce resource, and a simple policy design. There are of course many arguments in principle and practice about definitions of fairness and the impact of policy designs on different groups (Starkey 2012). See Text box H for a discussion of winners and losers.

TEXT BOX G: Why trading?

The available evidence shows that carbon emissions from household energy plus transport energy vary hugely between individuals (by a factor of 12 in a small sample of 32 UK individuals (Fawcett 2005)). Emissions depend on lifestyle choices, but also on geographical location, housing type and available heating fuels, amongst other parameters. The large variation in individual emissions is a key reason for the inclusion of trading.

If a rationing scheme had equal annual allowances and no trading either:

(a) approximately 40% of the population (with above average emissions) would have their energy use significantly restricted, immediately, to fit within their personal allowance

or

(b) the personal allowance would have to be set so high—to ensure most people could get the energy services they are accustomed to—that no significant savings would be made.

Trading is a mechanism to ensure both that the cap can be set at a level which delivers collective carbon savings and that people who cannot manage with their ration can purchase extra units. It also rewards those with a low carbon footprint, as they can earn money from selling spare allowances.

Trading is controversial, and there are many objections to it from both principled and practical standpoints.

25 This includes carbon dioxide, methane, nitrous oxide and F-gases.

These design choices can all be debated—and other researchers have proposed different policy designs. For example:

- In the UK, electronic Tradable Energy Quotas (TEQs) were proposed, covering the whole economy and divided among individuals (40%) and other energy users (60%) (Fleming 2006);
- In Ireland, Cap and Share (C&S) certificates covering the whole economy were proposed giving all adults emission certificates for an equal share of national emissions. Such certificates would be sold by individuals via banks and post offices to fossil fuel companies (Feasta 2008);
- In California, household carbon trading was proposed for household energy, managed by the utilities (Niemeier et al. 2008).

TEXT BOX H: Winners and losers

Carbon rationing would create ‘winners’ and ‘losers’—those with emissions higher than the ration amount would be losers, and those with lower emissions would be winners. People with low emissions could sell their spare ration on the carbon market. As people adjusted their consumption patterns in response to the ration, the distribution of winners and losers would change.

Vulnerable losers—those on lower incomes, facing significant extra costs under rationing, and without the capability to reduce their emissions—are of particular policy concern.

In parallel to carbon rationing, there would likely be additional support policies for vulnerable groups, to help them invest in/access lower carbon technologies or energy services. There could also be additional rations given to groups of concern—e.g. low income households living in rural areas, dependent on travelling long distances by car. However, raising the ration for some means that it is reduced for everyone else. It also effectively subsidises high carbon living, and should be a transitional measure for most groups, being phased out as low carbon options become more universally available.

8.5. Mechanisms of change

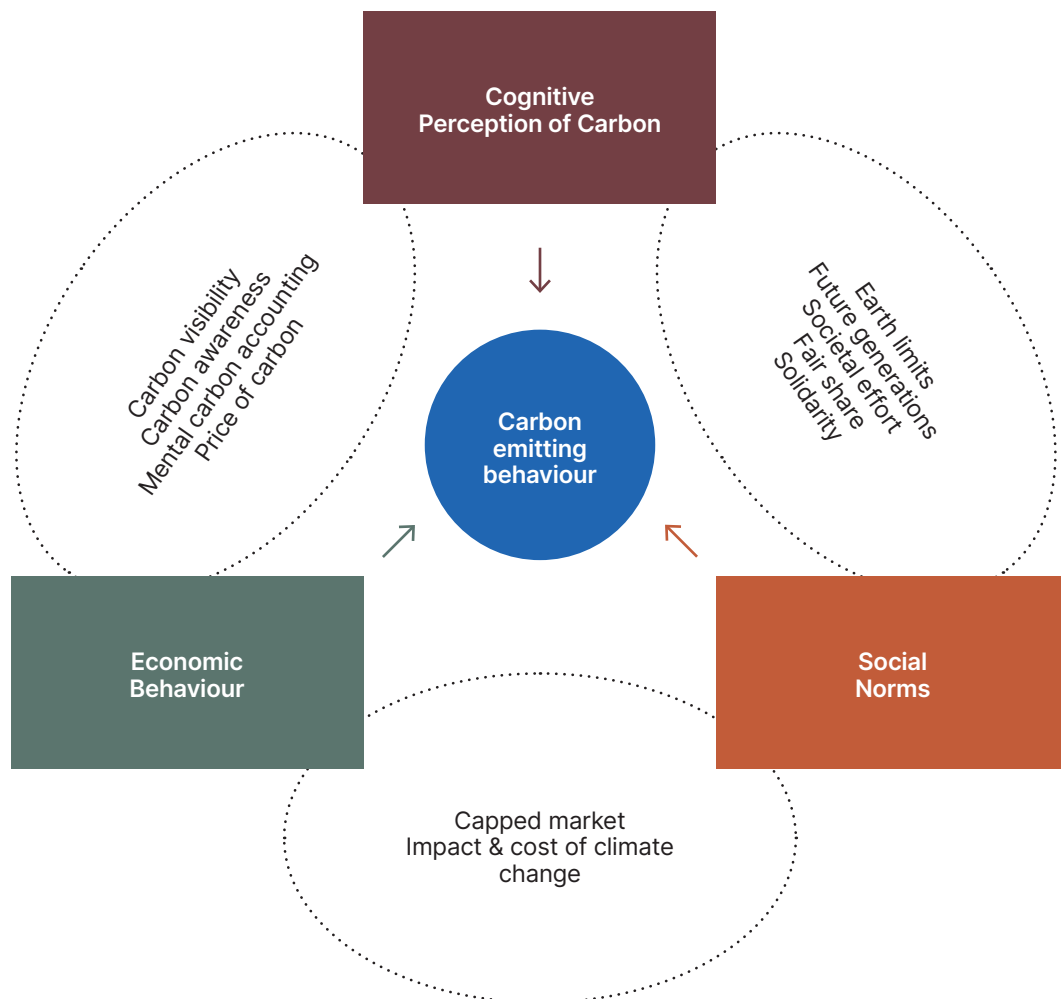
Rationing carbon is envisaged to influence individuals' carbon emitting behaviour through three interlinked and synergetic mechanisms: economic, cognitive, and normative (Parag et al. 2011). Figure 8.2 summarises the influence mechanisms.

Economic mechanism: the carbon price on personal emissions is likely to encourage people to prefer low over high carbon activities and goods, as the low carbon options will cost less. In addition, the introduction of a new virtual “carbon currency” and the shortage of carbon units created by the shrinking cap is likely to encourage mental carbon accounting and to promote economical use of carbon.

Cognitive mechanism: a PCA scheme is likely to engender new carbon and climate discussions and conversations in society, which in turn will increase carbon visibility and enhance individuals' awareness of their own impact on the climate. The cognitive process of linking actions and behavioural choices to consequences on climate is likely to encourage people to rethink high carbon emitting activities and prefer lower ones.

Normative mechanism: the underlying PCA premises of environmental limits, emissions fair shares, societal climate responsibility, and social solidarity are likely to create new social norms of what is socially acceptable behaviour and what is not. Because people tend to comply with prevailing social norms, it is envisaged that PCA will foster widespread low carbon lifestyles.

Figure 8.2. How PCA mechanisms could influence energy-use decisions and lead to low carbon choices



8.5.1. Trials

Personal carbon rationing has not been introduced anywhere on a mandatory basis. However, voluntary personal carbon rations, allowances, or budgets have been tested at various scales: locally through small ‘carbon rationing action groups’ (Howell 2012); in businesses, for employees (WSP 2021); across Norfolk Island, Australia in a health improvement and carbon reduction trial (Webb et al. 2014); and for transport at city-level in Finland (Kuokkanen et al. 2020).

The most recent trial is a personal carbon trading pilot in urban mobility in the city of Lahti, Finland. The aim is to incentivise citizens to reduce their mobility-related emissions through the means of a digital personal carbon trading (PCT) platform and mobile application. In addition, the aim is to improve citizens’ carbon emission literacy and introduce a personal carbon trading approach to the wider public (Kuokkanen et al. 2020).

An earlier trial, the Norfolk Island Carbon/Health Evaluation Study (NICHE), occurred on Norfolk Island, 1,500 km off the coast of Australia from 2011. Hundreds of residents participated and there was an electronic carbon accounting system, feedback on carbon emissions, and rewards for participation. The research aims were to test attitudes to an incentive scheme for saving energy and reducing carbon footprints and to test the hypothesis that increasing people’s environmental consciousness will have a positive impact on their health through better health behaviours (i.e., more exercise and healthy diet) (Webb et al. 2014; Webb and Egger 2014). Research on engagement with the Personal Carbon Monitoring System (PCMS) on Norfolk Island found significant pro-environmental changes in attitudes and behaviours towards the environment, carbon emissions, and climate change following the trial. Post-trial surveys also showed respondents believed most people would accept PCMS as a tool to improve the environment (Hendry 2019). Post-trial, there was an average 18% reduction in total household carbon emissions, from vehicle fuels (25% reduction) and electricity usage (12%). However, there was no reduction in body weight, one of the other hypothesised benefits of the intervention (Webb 2018).

8.5.2. Distributional effects

The distributional effects of carbon rationing depend on the design of the policy, the current distribution of personal carbon emissions, and the capacity of individuals and groups to respond to rationing and reduce their emissions. There is growing literature on how emissions vary by income and geography (e.g. Hargreaves et al. (2013); Kartha et al. (2020)). All the evidence suggests that carbon emissions go up with income, particularly transport emissions, and so lower income people

will be ‘winners’ and higher income people ‘losers’ under a PCA policy design, on average.

Detailed distributional modelling of the effect of a PCA in 2006 in the UK showed that despite the overall progressiveness of an equal per adult carbon allowance allocation system, a significant number of low-income households would be made worse off by PCT (30% of households in the lowest three income deciles). However, compensatory mechanisms—targeted additional allowances and financial compensation—if combined could significantly reduce the number of low-income losers by about half (White and Thumim 2009). Debate about different scheme designs to make rationing more just continues (Burgess and Whitehead 2020)—but there are few if any significant recent modelling studies—meaning that detailed questions about the distributional effects of rationing cannot be answered with confidence.

8.5.3. Public and political support

From the start, there has been concern about whether carbon rationing would be publicly and politically acceptable. It runs contrary to the conventional wisdom about the extent to which governments can and should challenge personal consumption. When it was discussed in the UK in the late 2000s, PCA was perceived by policymakers as a political risk (Bird and Lockwood 2009). There are clear political risks in advocating any challenging or radical policies, particularly if they have never been implemented elsewhere and there is no previous policy experience to learn from. In fact, the empirical finding that most people in the UK had negative feelings towards PCT (Owen et al. 2008) helped put an end to political interest in the topic.

The evidence on public views towards PCT to date is mixed. In various empirical studies, the share of people who feel positively about PCT ranges between 25% and 77% (Guo et al. 2021; Bristow et al. 2010). This variation may in part be attributed to differences between more and less recent research, geographical, or methodological differences (Bothner 2021). Public acceptability has been examined with methods as diverse as surveys and questionnaires, focus groups, (semi-)structured interviews, and choice experiments based on participants’ actual carbon footprints. On top of that, PCT is sometimes assessed on its own or compared with other carbon pricing mechanisms, such as a carbon tax or road pricing schemes. When confronted with alternatives, people tend to prefer PCT over these alternatives (Fawcett 2010). Public acceptance is generally higher when people think PCT is effective in reducing emissions, raises awareness for their individual carbon footprint, and when the scheme is perceived to be fair. The latter point often refers to the allocation of extra allowances to households with children, to individuals in the countryside with little access to public transportation, or to

low-income households (Bristow et al. 2010). Moreover, acceptance is often linked with a higher level of education and environmental attitudes (Wadud and Chintakayala 2019; Stam and Gerdes 2021).

For those who reject PCT, concerns about implementation difficulties are key (von Knobelsdorff 2008). In addition, acceptability tends to be lower with lower understanding of the mechanism (Wallace et al. 2010). Maybe unsurprisingly, people who fly often, live in large houses, or generally have a high carbon footprint are less in favour of PCT than others (Larsson et al. 2020).

The overall message from this research is that the answer to the question of what the public thinks depends on the details of the rationing scheme, how it is explained, what it is compared with and which public is consulted.

Using deliberative processes to design and debate scheme rules could be a powerful way to build and ensure public acceptance. In Lahti, Finland in a trial of personal transport allowances, allowance allocation was determined with citizen engagement through surveys and workshops (Kuokkanen et al. 2020).

8.6. Comparison with a carbon tax

Key alternative approaches to personal rations are ‘upstream’ trading and carbon taxation. Upstream trading

is where tradeable carbon caps are set high up the fossil fuel delivery chain, such as at the fossil fuel producers, energy utilities, or the energy retailer level. Carbon taxation could be implemented on fuels/energy sources at retail level, or higher up the delivery chain and then be passed down to household (or both). Economic evaluations from more than one decade ago indicated that introducing a personal carbon rationing mechanism would cost more and be more complex to implement than either upstream cap and trade or carbon taxation (Lockwood 2010; Sorrell 2010). However, in the last decade the huge advancements in data management capabilities and the penetration and availability of smartphones have dramatically reduced many of the implementation and management costs (Fuso Nerini et al. 2021).

Key comparisons between carbon rationing with taxation are set out very briefly (Table 8.1). Clearly there are pros and cons for each policy idea. For example, a carbon tax fits well with existing policy and economic paradigms that treat actors in society—companies and individuals alike—as economic entities. It encourages desirable behaviours by putting a price tag on undesirable ones, and encapsulates the polluter pays principle. Whereas PCA aims to influence behaviour also by altering individuals’ perception of social responsibility and by encouraging citizens to adopt low carbon lifestyles.

Table 8.1. Comparison between a PCA scheme and a carbon tax

	Personal Carbon Allowance	Carbon Tax
Coverage	Depending on the design, could cover all direct and indirect personal emissions	Depending on the design, could cover all direct and indirect personal emissions
Influence mechanisms	Economic, cognitive, normative	Mainly economic
Allocation rule	Equal per capita	No allocation
Carbon visibility	Increases carbon visibility and encourages carbon budgeting	Increases carbon visibility
Price of carbon	Determined by shortage of units	Pre-set by government
Trading	Carbon units can be traded in the personal carbon market	No carbon market or carbon trading
Vulnerable groups	Additional policies needed to support vulnerable groups	Tax revenues could be recycled to support specific vulnerable groups
Social norm	Induces new carbon allowance social norm	Does not induce social norm
Public support	Unknown, likely to be influenced by communication and framing	Public tend to oppose new taxation
Policy certainty	Cap on emissions increases the certainty of achieving the policy targets	No carbon cap, and lower certainty of meeting policy targets
Administrative cost	Higher than taxation, as new administration and market structure need to be created	Lower than PCA, as the administration structure already exists
Policy risk	Risky, as there is no policy experience	Less risky, as taxation is familiar policy mechanism

Readers will make their own judgement on which arguments are most compelling. However, when thinking about carbon rationing or any new policy proposals, it is important not to fall into the trap of ‘policy perfectionism.’²⁶ All policies have downsides as well as upsides. They must be judged on a variety of criteria, and considered in light of the status quo, which itself is far from perfect.

8.7. Next steps

Carbon rationing is an important idea, which has the potential to be developed into a powerful policy tool. There is some research and evidence showing how it could be implemented in practice and what the effects would be, but also much which is unknown. More research is needed—but, importantly, so are thoughtful conversations among politicians and with the public—not least to direct research to key issues of concern. Political and public engagement with and support for the idea is essential for it to be introduced (Fawcett and Parag 2010).

Further public and political discussions about rationing can begin immediately. Citizens assemblies have been shown to be a good venue for thoughtful responses from citizens to policies needed to address the climate crisis (Mellier and Wilson 2020). Local and national assemblies focused on debating the value and design of carbon rationing policies would be extremely valuable.

There is a significant research agenda to take rationing from a promising idea to a policy design with enough supporting data for an evidence-based decision to be made on its adoption. Because the detailed design of rationing determines its effects, this research needs to be nationally-specific, to take account of national priorities, the current distribution of carbon emissions and opportunities to reduce personal emissions, and the surrounding policy environment. Future research will need to include field trials of elements of carbon rationing including technology, communication and effects on behaviours and decision-making, and modelling of the impacts of different policy designs.

26 ‘Policy perfectionism’ has been identified as one type of ‘discourses of climate delay’—discourses that admit the existence of climate change, but justify inaction or inadequate efforts (Lamb et al. 2020).

9 – International Carbon Allowances in Achieving a Fair Consumption Space

9.1. Taxing or rationing

The distribution of scarce resources (and the right to emit is seriously limited) can in principle be handled in two different ways: through market-based mechanisms or with physical caps. Market-based options use taxes to increase efficiency to decouple economic activity from pollution—as in the green growth model. However, effective and efficient protection of global public goods requires collective political action to overcome the inability of private agents to capture any benefits, and hence the failure of market mechanisms (Nordhaus 2015). Furthermore, a plethora of studies have shown that a permanent decoupling sufficient to address the climate crisis has not occurred anywhere, and is unlikely to do so in the future (e.g. (Haberl et al. 2020; Pihl et al. 2021; Vadén et al. 2021)).

Hence, only the option with physical caps seems to have the potential to be effective. This means to quantitatively limit the total emissions through legal, economic, and administrative means, regardless of to what extent this is compensated by efficiency improvements. Given the social insensitivity of markets (Wilkinson and Pickett 2011) and the increasing intra- and international polarisation of wealth (Piketty 2014), it is rather obvious that the social justice objective highlighted in the SDGs requires making this option operational (Ganzleben and Kazmierczak 2020; Xu et al. 2020).

This is where international carbon rationing comes in. Global carbon sinks are overwhelmingly public goods, which lack adequate legal protection. In particular, a fair allocation of the environmental space is nothing individuals or free markets can achieve—the required collective action must be initiated and coordinated by authorities (Martínez-Alier 2002; Bromley 2007). Hence a broader approach, with governments

taking the lead, is needed to complement individual efforts.

Rationing is admittedly a controversial measure (often strongly opposed by those advocating market solutions and betting on efficiency gains), but can be effective also in the short run and is urgently needed to mitigate disaster and minimise global catastrophes—it is already too late to completely avoid large-scale disasters (Alcott 2010). The result would be a significant reduction in carbon-intensive consumption in affluent nations or trade blocs like the EU, where two-thirds of the global consumer class reside. Resistance by those benefiting from the status quo is to be expected, as one key result would be ending their current privileges (which they have enjoyed since the colonial era and have come to consider an entitlement) (Brand and Wissen 2017). However, ending overconsumption, that is consumption exceeding the planetary boundaries, is exactly what the climate, and sustainable development more generally, need right now.

9.2. Institutions for international rationing

This leads us to the question of how to distribute the scarce sink capacities of the planet. The climate system—like the atmosphere, space, or the deep sea—does not belong to anybody but can be considered the common heritage of humankind. And as according to the Universal Declaration of Human Rights all humans are born equal, they are entitled to an equitable share of this heritage. Consequently, fair sharing requires that the remaining carbon budget should be distributed amongst countries according to their population, based for example on the population projections for 2050 as the climate target year as these are the people, current and future,

who will bear the burden of the climate crisis (Agarwal and Narain 1991). In a globalised, trade-intensive world, allowances must cover the carbon embedded in traded goods, leading to a carbon balance composed of domestic emissions and the net emissions embodied in trade to be accounted for, as using the quota allocated in the carbon sink rationing. The EU tradable permit system for CO₂ emissions, combined with the planned Carbon Border Adjustment Mechanism, already offer important building blocks for a carbon rationing regime.

Once the distribution of entitlements is allocated to countries on this basis, the next step is enforcing the resulting limitations on a national level. Staying within allocated limits cannot be left to individuals as even with willing citizens, many of the underlying factors that shape consumption patterns, such as public services and infrastructure investments, can only be addressed by governments.

However, any such move towards allocation of sink entitlements needs to be administered internationally. Individual countries or trading blocs can take initiatives, as they have done in the past. For instance, the EU Green Deal policy of combining more ambitious climate targets with a new Carbon Border Adjustment Mechanism has in essence established a Climate Club for its members. In such clubs, member states weigh the membership benefit against the decarbonisation efforts (and in the EU, the subsidies coming with them), and the otherwise more reluctant members go with the group (Nordhaus 2015).

Nonetheless, a full-scale global system for emission allowances would require a legal base in an international convention. It will take considerable time to negotiate and adopt a new convention and to make an international authority for carbon allocation operational.

9.3. International rationing and the global trade regime

Reducing consumption of carbon-intensive goods has knock-on effects as transporting, refining, transforming, delivering, and discarding materials are activities that consume a significant share of the total primary energy. In particular, the rare earth elements which require extremely high inputs of energy per ton of material in mining and refining would be permanently limited, with severe implications for the Green Growth strategies pursued by any governments, but also for decarbonisation and climate policy. According to the International Energy Agency, “today, the data shows a looming mismatch between the world’s strengthened climate ambitions and the availability of critical minerals that are essential to realising those ambitions. [... For instance, a] typical electric car requires six times the

mineral inputs of a conventional car, and an onshore wind plant requires nine times more mineral resources than a similarly sized gas-fired power plant.” (IEA 2021).

Reducing energy consumption on a global scale, instead of only accelerating the switch from fossil to an ever increasing consumption of ‘non-renewable-resources-based-renewable-energy’ appears an important condition to make decarbonisation sustainable; rationing the consumption of resources beyond carbon sink access is an option still not sufficiently explored, but undoubtedly necessary, not least to guarantee the continued provision of carbon-free energy without breaking through the walls of environmental space and consumption corridors.

Legally an import-limiting regime, for the time being regulating trade based on the embedded carbon content, would probably be possible under the WTO regulations, as long as the standards set are non-discriminatory. However, the arbitration processes foreseen in most free trade agreements offer companies (foreign, or domestic through foreign subsidiaries) the opportunity to demand compensation for loss of expected revenues, caused by being hindered to continue polluting but lucrative activities (Kumm 2015; Marisi 2020). An international Convention would minimise this risk.

The ethical principle of the right to equitable shares of global carbon sinks has been the starting point of this argumentation. However, obviously the current situation is different, in and between nations. Hence an equitable allocation of rights will cause surplus entitlements for some, and shortcomings for other nations or blocs. Applying trade mechanisms established since the Kyoto Protocol and the Clean Development Mechanism (CDM) to these emission rights is a matter of political will, not of technical or legal difficulties. Countries with the highest per capita emissions, like some Gulf monarchies and other oil producing countries—Canada, Australia, the USA, Korea, Taiwan, the EU and even China—would have to try buying certificates from poorer countries (OECD n.d.). A Carbon Allocation Authority or trading platform could help here as well, as in bilateral negotiations the poor tend to sell cheap, not least due to arms twisting by powerful nations, and the risk for corruption where leaders agree to bad deals for private gain could be minimised. The current South-North monetary flows would be reverted, and the finances for strong sustainable development could be in sight at least. Simultaneously, such a regime would provide incentives for poorer countries not to pursue the usual emission intensive development path, as this would diminish the permit income. Open access to renewable energy and energy efficiency technology should be one element of what a carbon managing authority would have to offer to its clients.

9.4. Near term perspectives

International rationing—while strongly influencing prices through market mechanisms—does not generate revenue for the state or bloc introducing it, but border payments do so. The Carbon Border Adjustment Mechanism suggested by the European Commission will be charging imported goods according to the CO₂ emitted during their production, resulting in income for the public purse. The revenues will be partly needed to compensate exporters, but due to its negative trade balance in terms of embodied resources, a significant surplus income for the EU can be expected (Bruckner et al. 2012; Dorninger et al. 2021). Since the market stabilisation effect is reached by skimming off the price advantage resulting from less ambitious climate targets, the money is disposable, following politically set priorities. As long as the suggested, rationing-based permission trading system does not exist, the Border adjustment income is the most plausible stand-in for financing adjustment processes in countries affected by the new regime.

In particular, voices from the South have been criticising the planned Carbon Border Adjustment Mechanism as discriminatory to their exports, and indeed exporters with the lowest carbon productivity will be hit hardest—but that is a stimulus which is part of the overall approach (UNCTAD United Nations Conference on Trade and Development 2021). Hence the question should not be one of exemptions, weakening the performance of the incentives offered by the club, but how to support the transition to a low carbon production system in the Global South.

To answer this question, three groups of Southern exporters to the EU have to be distinguished:

- For all agricultural goods, lowering carbon intensity can be achieved by employing agroecology measures, reducing fertiliser and pesticide use, and improving crop composition. As an important co-benefit, such a move would significantly reduce the pressures driving the loss of biodiversity (IPBES 2019) while creating jobs and improving the quality of water streams above and below ground. This way, a Carbon Border Adjustment would contribute to a series of SDGs simultaneously.
- For those companies, which moved to the South to avoid increasingly strict regulations (compliance and hence pollution is much cheaper in many parts

of the South) while exporting their products for instance to Europe, it just means that the standards they tried to undercut will catch up with them. This would upend the abuse of the South as low-cost pollution location and production waste dump (Statista 2021a). This is not insignificant, as more than a third of the EU emission reductions has been achieved through relocation (Schütz et al. 2003), and with tightening rules more is to be expected without a Carbon Border Adjustment Mechanism.

- For small farmers trading through cooperatives, for small and medium size enterprises (SMEs) and other local businesses, support is necessary. Here the surplus income from the Carbon Border Adjustment Mechanism comes in handily—instead of using it as a windfall profit for the EU budget, a portion²⁷ should be spent on a Climate Adaptation Fund for production systems, in particular small holders and SMEs, helping them to keep step with the emerging EU legislation. Financing cooperation—including but not limited to technology transfer—would be an adequate and legitimising way of spending the funds.

9.5. Not letting the best become the enemy of the good

The jury is still out on what might be the best “how” to implement enforceable measures to make 1.5°C lifestyles, in all their diversity, the ‘new normal’ of the future citizen-consumer society. However, all pros and cons of different pathways must not distract from the need for rapid action to drive down emissions. The state of the natural world and the ongoing trends make quantitative limitations of resource consumption and carbon emissions an undeniable necessity, requiring a radical change of existing policies. The term “radical” is derived from the Latin “radix”, meaning “root”. Rationing is a rational approach to address the root causes of overconsumption, and turning the proposal into policy is one of the best instruments to address the climate crisis before it turns into a catastrophe.

²⁷ Many of the strategies presented in this policy section could support each other in implementation. For example, revenue created by a border mechanism could also help fund universal basic services (UBS), reducing private consumption further as well as countering the effects of increasing costs of imported consumer goods.