

## 6 POLLUTER PAYS

Sustainable consumption is defined net of the capital maintenance spending on the current national account. Together with remedial investments, this knocks back the current consumption level. That leaves a further adjustment that needs to be made: adjusting the prices to internalise pollution costs. Sustainable consumption is net both of capital maintenance and of the costs of pollution.

Polluters should pay for the pollution they cause. This is a secondary principle of the sustainable economy, alongside the precautionary principle. Ultimately, it is you and me who buy the stuff, and hence we are the ultimate polluters. Since we are currently not paying the full costs of that pollution, it is another reason why we are living beyond our environmental means, and hence implies one more notch down in consumption.

This adjustment is likely to be large. In most economies, it is the polluted who mostly pay, and worse some polluters are actually subsidised, notably in agriculture. A world where polluters pay would have widespread carbon taxes on domestic production and imports, pesticide and fertiliser taxes, ammonia and air pollution taxes, higher prices for water to reflect the damage of abstraction, higher prices for sewage disposal, taxes on plastic, palm oil and cement, and so on.

All that stuff listed in your carbon diary and your wider environmental impacts diary would be more expensive, and those alternative lower-polluting things would benefit from relatively lower prices. No

prices would go down absolutely, and the sum of all of those that go up would be a measure of the costs of the pollution you and I are causing. Trade would go down: all that polluting carbon-intensive stuff imported from China would be more expensive, as would the hardwood and beef from the cleared Amazon rainforest. Food prices would rise, as would many of the use-once clothes and anything wrapped in plastic.

In response, companies would try to minimise packaging, plastics and waste to bear down on costs. Entrepreneurs would seek new ways of reducing pollution to cut costs. Local organic food would be relatively cheaper, as would locally produced products. There would be significant re-shoring of major industries as importers were caught by the polluter-pays principle. As an example at the global scale, building the new road through the Amazon – the BR-319<sup>1</sup> – to enable loggers to get more hardwoods out to sell in international markets would not be so attractive, given that the full environmental costs of the destruction by the loggers would make the price of the timber incredibly high. The new set of corrected relative prices would change the structure of the world economy and each national economy in profound ways and change your shopping habits. This is what it means to put the environment at the heart of the economy.

Getting people to pay for their pollution, and to pay for the capital maintenance, is a tough ask. But it would be necessary to meet the requirements of the sustainable economy. It is a further requirement if we are to live within our means. The fact that we may (and almost certainly will) resist does not make the problems go away. As ever, what is not sustainable will not be sustained. The climate will get ever hotter, the rivers will continue to decline and biodiversity will continue to go down.

## Pollution and Market Failure

In the 1920s and 1930s, when the great economic theories, both conventional and the Austrian, which shape the way we live now, were being developed, very little thought was given to the environment. It was largely an afterthought, as it would continue to be throughout the great industrialisations of the twentieth century. On the

<sup>1</sup> See P.M. Fearnside (2022), 'Amazon Environmental Services: Why Brazil's Highway BR-319 Is So Damaging', *Ambio*, 51, 1367–70.

macroeconomic front, Keynes did not appear to care much about it at all, being keen to increase output and reduce unemployment, not conserve nature. On the microeconomic front, the primary market failure considered was monopoly. Marx had predicted that capitalism would end up with monopoly, and hence monopoly capitalism, whilst the mainstream economists focused on the conditions for a perfectly competitive general equilibrium, with efficient prices that fully reflected costs, but had no monopoly mark-up.

The market failure paradigm persists today as the main way to analyse how markets measure up against this perfectly competitive equilibrium, how far prices deviate from their 'correct' level and how to identify cases for potential interventions. Back then, some had begun to recognise that pollution might be one of those market failures that needs addressing, though in the great summaries of the mainstream theoretical outlook, notably Hicks's *Value and Capital*, they are hardly prominent. It is not even in the book's index.

Arthur Pigou, in his *Economics of Welfare*,<sup>2</sup> is widely credited with being the first major economist to take environmental considerations seriously. The environmental problem as he saw it was that there were certain costs which were not internalised in market prices (externalities), and since all prices should fully incorporate all costs in an efficient economy, the way to address the environment was through the application of what become known as a Pigouvian tax to correct for these externalities and hence ensure a more efficient outcome. It is rarely recognised that if fully applied to all externalities, Pigou's taxes would have been much more radical than all and any of Keynes's ideas. The vector of prices, which is the solution to the economic allocation of resources, would be very different. Put another way, in every circumstance there is always pollution, and hence all market prices are wrong, distorting choices and outputs.

In the economics textbook, the marginal costs and marginal damages are adjusted to include the pollution costs, and hence the new equilibrium price is where the social marginal costs equal the social marginal damages. Putting aside the technical issues of what happens to income when the price is adjusted,<sup>3</sup> the neat theoretical comparison

<sup>2</sup> A.C. Pigou (1920), *The Economics of Welfare*, Basingstoke: Palgrave Macmillan.

<sup>3</sup> In comparing the two equilibria, there is an income and a substitution effect. Hence, in estimating the impacts, there is a technical issue about whether the new equilibrium should be income-compensating, as described for example in the general analysis of price changes

of the new equilibrium, inclusive of the externality costs, has three problems: that the marginal costs and marginal damages have to be estimated; that there are no additional market failure distortions like monopoly which might interfere with the corrections; and how the tax revenues are spent.

How would the economists know the social marginal costs and social marginal damages? There are no controlled experiments, so the experts have to rely on engineering, statistical and other tangential evidence. On many bits of these calculations, they face radical uncertainty, peering into the future, and cannot observe what would happen if these marginal costs and damages changed *marginally*. As we shall see later in this chapter, there is no obvious agreed way to estimate the social cost of carbon, and many of these exercises are conducted in the context of deep vested interests and lobbying.

Supposing for a moment the experts get the right answer. If the rest of the economy is distorted by market power, then correcting the particular prices for the externality will be a correction to a price which is already distorted for other reasons. A monopoly may be charging a price above costs already, so the externality tax is an additional price increase. Put together, these price increases will be excessive. This is called the problem of the second best,<sup>4</sup> and is very prevalent.

The theory of the second best suggests that making one market correction while ignoring other market imperfections in a *ceteris paribus* fashion can be counterproductive, since it can exacerbate the substitution effects between the corrected prices and all the others, widening the misallocation of resources. The perfect in particular circumstances can actually be the enemy of the general good. We could, for example, unilaterally decide to limit territorial carbon emissions in, say, the UK (we have), but having fixed our carbon markets and emissions accordingly, we could make global warming worse by the incentive thereby created to buy imports rather than produce at home. This is a classic example of the second best,<sup>5</sup> and it helps to explain

in J.R. Hicks (1939), *Value and Capital: An Inquiry into Some Fundamental Principles of Economic Theory*, Oxford: Clarendon Press.

<sup>4</sup> On the second best, see the classic paper: R.H. Lipsey and K. Lancaster (1956), 'The General Theory of Second Best', *Review of Economic Studies*, 24(1), 11–32.

<sup>5</sup> This is why unilateral carbon pricing requires a carbon border adjustment mechanism. See Helm, *Net Zero*, pp. 120–4; and D. Helm, C. Hepburn and G. Ruta (2012), 'Trade, Climate Change, and the Political Game Theory of Border Carbon Adjustments', *Oxford Review of Economic Policy*, 28(2), 368–94.

why, despite all the efforts in the UK (and the EU), raising the cost of unilateral territorial carbon emissions has not limited the growth of carbon concentration in the atmosphere. It may have even made emissions worse.

The final problem is what to do with the money. Pollution taxes raise revenue, and where the demand is inelastic (demand holds up even as prices rise), potentially the amounts can be large. That is why general taxation goes after fossil fuels and tobacco and alcohol (another second-best problem), and historically has gone after salt. There are two broad approaches: recycle back into general taxation, spending on capital maintenance, health, education, public goods and welfare; or targeted spending on creating substitutes for the non-polluting technologies, such as low-carbon energy. Both options raise the possibility of what is sometimes called the ‘double-dividend’ from pollution taxation. We will return to this point later on, notably in considering the inflows to the national fund and national dividend.

But before we do, there are a couple of other aspects of the Pigouvian tax approach to note. What the adjustments to include social costs and damages show is that it is only in very special cases that the optimal level of pollution is zero. To an economist, this is pretty obvious, but not to many environmentalists. Human economic activity changes the world from what it would be without humans. Almost everything we do has costs and benefits not only to ourselves but to all the rest of the natural world. Just the act of breathing inhales oxygen and expels carbon dioxide. Only where the impacts have really big detriments – say mercury discharged into a river – is the optimal level of pollution zero. But if it were generally zero, then the human times are pretty much over.

Pigou and his followers, armed with their techniques for estimating marginal social costs and damages, move on to intervening to correct the market failures, by adjusting the prices (though they could regulate these by adjusting the output).<sup>6</sup> Such corrections of market failures are worth doing only if the resultant expected ‘government failures’, caused by political incentives, corruption,

<sup>6</sup> In theory, they could change prices, outputs or regulate rates of return. See D.M. Newbery (1997), ‘Rate-of-Return Regulation Versus Price Regulation for Public Utilities’, Department of Applied Economics, Cambridge University, [www.econ.cam.ac.uk/people-files/emeritus/dmgn/files/palgrave.pdf](http://www.econ.cam.ac.uk/people-files/emeritus/dmgn/files/palgrave.pdf).

lobbying, imperfect information and capture, are expected to be less than the identified costs of the market failures. They usually are not. Hence, most market failures go unchecked for fear of making matters worse. In the case of externalities, this means that there is, by default, lots of pollution which continues despite being inefficient, on the grounds that government interventions would make things even worse.

The most that can be said for this mainstream market and government failure paradigm is that it is a classification that enables us to look at any market and at least diagnose some of its problems. It points us not only to externalities, but also public goods, monopoly and informational failures. It illustrates that almost all prices are wrong. What it is less good at is working out what to do when there is little prospect of getting the prices right. Intervening depends on whether governments know what they are doing, and that the government intervening is not swayed by lobbying from oil companies, farmers' unions, renewables advocates and indeed lobbyists for every interest affected by interventions. The costly failure of many climate change policies is best explained by climate lobbying. Looking at both market failures and government failures requires that experts do their homework properly. Not surprisingly, those on the left focus on market failures, and are optimistic about governments getting the right answers; those on the right worry more about the failures on the government's side.

A classic recent example can be seen in the cost estimates provided by the UK CCC for the trajectory to net zero in the UK. This is pitched at the (implausibly low) 1 per cent per annum of GDP.<sup>7</sup> How could it cost so little to switch from a carbon-intensive economy (around 80 per cent dependent on fossil fuels) to a low-carbon one in a matter of less than three decades? The answer is that the CCC (and then the Treasury) *assumes* that all the interventions necessary to decarbonise will be perfectly executed. There will be no government failures. Indeed, the Treasury's interim report of its 'Net Zero Review'

<sup>7</sup> Climate Change Committee (2020), 'The Sixth Carbon Budget', December, [www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf](http://www.theccc.org.uk/wp-content/uploads/2020/12/The-Sixth-Carbon-Budget-The-UKs-path-to-Net-Zero.pdf); and (2020), 'Building Back Better – Raising the UK's Climate Ambitions for 2035 Will Put Net Zero Within Reach and Change the UK for the Better', 9 December, [www.theccc.org.uk/2020/12/09/building-back-better-raising-the-uks-climate-ambitions-for-2035-will-put-net-zero-within-reach-and-change-the-uk-for-the-better/](http://www.theccc.org.uk/2020/12/09/building-back-better-raising-the-uks-climate-ambitions-for-2035-will-put-net-zero-within-reach-and-change-the-uk-for-the-better/).

has a whole chapter on market failure, and an annex too, but fails to mention government failure *at all*.<sup>8</sup>

To the extent that there are remaining costs, a Keynesian macroeconomics perspective assumes that the spending will increase aggregate demand and hence spur economic growth. Investment, on this analysis, is not a cost, and there is no need to forgo consumption to provide the savings to finance it. None of this is remotely credible. That this is at best naive is demonstrated below in chapter 7 when we come to the macroeconomics framework.

### The Alternative – Coase Bargaining

Pigou and the conventional market failure paradigm have not gone unchallenged. An alternative school of thought, associated with the Chicago successors to the Austrians, as staunch defenders of markets and opponents of intervention, offered an ingenious answer to the externality problem: to deny it existed. In a famous paper in 1960, ‘The Problem of Social Cost’, Chicago school economist Ronald Coase suggested that, if left to themselves, externalities would be internalised by bargaining between the affected parties.<sup>9</sup> If, for example, an upstream chemical plant polluted the river with its effluent, a downstream fish farm would find its output and profits damaged as it faced the costs of cleaning up the pollution. In Coase’s bargaining model, the fish farm could bribe the chemical firm not to pollute so much if the chemical firm had the right to pollute, and if the right to clean water lay with the fish farm, it could sue for compensation. The outcome, in the absence of any transaction costs, would be to internalise the pollution between the two parties at the optimal level. It would be the outcome that would have resulted if the two firms had merged together to jointly profit-maximise.

Coase’s remarkable paper triggered a focus on property rights, and on the law as the bastion for the guarantee and sacred protection of those rights. It aligned with Robert Nozick’s *Anarchy, State, and Utopia*,<sup>10</sup> in which the economic borders of the state are confined to

<sup>8</sup> HM Treasury (2020), ‘Net Zero Review 2020: Interim Report’, December, [https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment\\_data/file/1004025/210615\\_NZR\\_interim\\_report\\_Master\\_v4.pdf](https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/1004025/210615_NZR_interim_report_Master_v4.pdf). Its final report is slightly more nuanced.

<sup>9</sup> R. Coase (1960), ‘The Problem of Social Cost’, *Journal of Law and Economics*, 3, 1–44.

<sup>10</sup> R. Nozick (1974), *Anarchy, State, and Utopia*, Oxford: Basil Blackwell.

the minimum protective state, and it echoed Hayek's *The Constitution of Liberty*. The economic problem, including the environment, became a problem of the law, a matter of making sure that everything is owned by someone and property rights are enforced. In effect, the problem is solved if the environment is fully privatised.

The difficulties that Coase's approach faced mirrored the difficulties the conventional economists had with the theory of perfect competition. It is an argument largely based on assumption, and the assumptions required for Coase's result to hold are so restrictive as to render the outcome of bargaining reaching the optimal level of pollution a very special (utopian) case. Coase assumes zero transaction costs, so that the legal enforcement of the property rights would not need expensive lawyers and judges, just as Adam Smith needs his invisible hand (and the modern version of the general competitive equilibrium needs a costless auctioneer)<sup>11</sup> to make markets work, equating supply and demand. In all these cases, the game is over before it started. The results are in effect just the working out of the assumptions.

As for Pigou, knowledge of the extra environmental marginal costs and damages is often notable by its absence, and the estimates presented are often the result of lobbying and spending on 'expert evidence' by the incumbents. The uncertainty is multifaceted and has a serious time dimension too. Much pollution is diffuse, and the great pollution problems are about regional and global ecosystems, and beyond individual countries' legal systems. The impacts of the pollution tend to show little respect for legal institutional boundaries. Burning the Amazon rainforests might make sense to some Brazilians, and burning coal might appeal to some Chinese, but possibly not to most of the other 8 billion people on the planet as the earth's systems are undermined. The added difficulty of non-marginal environmental systems is that they are not disaggregated in neat, discrete legal property units. Addressing these multiple issues is about bargaining over the whole Amazon system, not specific trees or hectares.

That both Pigou's and Coase's approaches are hamstrung by their assumptions does not of itself render them of no value in

<sup>11</sup> An alternative is given in A. Chandler (1977), *The Visible Hand: The Managerial Revolution in American Business*, Cambridge, MA: Belknap Press.

considering how to tackle pollution. Coase makes us concentrate on the rights and duties of ownership, rather than on who owns them. Taken seriously, the environmental, social and governance (ESG) movement – the attempt by shareholders to influence the behaviours of corporates on environmental, social and governance issues – has realised that these rights and duties can be changed. Pigou makes us take pollution taxes seriously.

Coase's approach adds one more challenging implication. For Coase, the distinction between polluter and polluted is irrelevant. It is about who owns the rights. In the Amazon case, the polluted could pay the polluter not to pollute. That indeed is what the Brazilian government continually suggests,<sup>12</sup> demanding to be paid not to cut down more of its rainforest. Other developed countries could pay the Chinese not to burn coal. India argued at COP26 that developed countries should pay for its transition to net zero.

These are all examples where there is no agreed and binding legal framework or enforcement mechanism. It opens up the possible role of the state as proactively defining and newly assigning property rights over environmental assets.<sup>13</sup> For Coase, the crucial point is just that everything should be owned. Ownership is a necessary condition for addressing pollution. Hence, some economist-minded environmentalists have tried to extend ownership to the sea, building on the UN's 1982 Convention on the Law of the Sea, and to divide up and auction everything from fishing quotas to carbon permits and carbon offsets. The remedy for pollution is to privatise environmental assets as much as possible.

Pigouvian taxes also require property rights in a negative form – property obligations and liabilities. To own something is to be responsible for it and assigning responsibility is necessary to designate who should pay the tax to correct Pigou's externalities. Unowned commons cannot be taxed. If nobody owns the open oceans, no one can be held responsible for polluting and then overfishing. They are literally beyond the law.

<sup>12</sup> That indeed is what Brazil has proposed. See news reports including [www.reuters.com/business/environment/brazil-demand-us-pay-upfront-stalls-deal-save-amazon-forest-2021-04-15/](http://www.reuters.com/business/environment/brazil-demand-us-pay-upfront-stalls-deal-save-amazon-forest-2021-04-15/).

<sup>13</sup> See T.H. Tietenberg and L. Lewis (2018), *Environmental and Natural Resource Economics*, London: Routledge.

## The Polluter-Pays Principle

For Coase, the reason why there is no distinction between whether it is the polluter or the polluted who should pay is that it is just a matter of who has the property rights at the outset. It is about economic efficiency, and considerations of fairness, responsibility or stewardship have no part to play. Coase does not advocate that the polluter should pay, but rather that property rights should be taken seriously.

Putting aside the ineffectiveness of the Coase approach against the scale of environmental damage and the systems nature of the atmosphere and biodiversity, why then might it be better, both in terms of efficiency but also on wider moral grounds, for the polluter to pay? Why should the polluter-pays principle be universally applied? How might it be effected in the case of Brazil?

There are two separate justifications for the polluter-pays principle: economic and political. The economic case starts with the observation that the price of polluted goods is too low, and hence output will be too high. We consume too much of the polluted goods, and thereby live beyond our environmental means. Add up all this excessive consumption of polluting goods and you get a measure of the aggregate excess consumption over the sustainable consumption growth path. The optimal pollution may not be zero, but if the polluter does not pay then it will be excessive.

If the polluter is paid not to pollute by the polluted then the polluter's income will not be reduced. It will be the same, if the payment equals the cost of reducing the pollution. Output will therefore remain higher than is consistent with the sustainable economy. In the Brazilian example, money will flow to the Brazilian government to offset the loss of income from not cutting down the rainforest. It can then be spent on other activities, many of which might be polluting and the aggregate level of consumption will remain above the sustainable level.

There is also an incentive implication. If the polluter pays a pollution price, this is translated into an incentive for the polluter to seek out less-polluting methods of production or just to lower output. A carbon tax encourages the polluter to switch to less-intensive carbon fuels (gas rather than coal, for example) and wind, solar and nuclear electricity generation, and the higher price reduces the general demand for fossil fuels. The oil company is worse off than it otherwise would

have been. Over time, it will be encouraged to first switch away from and then, if the costs are high enough, to exit fossil fuels.

Now consider the Coase possibility of paying the oil company not to pollute. The (perverse) incentive might be to increase pollution to attract a higher price, and the output of oil and gas is unlikely to fall much. In Brazil's case the prospect of being paid not to cut down the rainforest might actually encourage it to increase the rate of destruction in advance. That arguably has been the case since 2014, and after COP26, with a fund being made available to pay polluters to stop chopping down rainforests by 2030.<sup>14</sup> Not surprisingly, since the prospect has been opened up of being paid to protect the Amazon, the rate of destruction recently accelerated. Farmers who similarly face the prospect of being paid not to strip out carbon from the soils, and even better being paid to put it back, might increase the destructive farming methods *ex ante*. Carbon offsets offset more carbon, the poorer the baseline is. It might pay to trash the soils in advance of being paid to put the carbon back again. There is here a policy asymmetry between polluter and polluted pays. The former avoids the perverse incentive problem; the latter positively encourages perversion.

If the prices are corrected to internalise the pollution, and hence the polluter pays, the competitive economy takes on the challenge of reducing pollution. Entrepreneurs look for new technologies and ways of capturing emissions, for example through carbon capture and storage (CCS) and natural carbon sequestration. That is what even oil companies, faced with carbon prices, are now trying to do, challenged by a plethora of new entrants with new business models. With carbon prices in the EU and the UK rising sharply towards €100 and £100 respectively at the end of 2021, and stabilising after Covid through 2023, these incentives are greatly increased. Ironically given the very different schools of thought, Pigouvian taxes might be the best way of improving the effectiveness of the Austrians' model.

The political case is one of fairness, and making those who harm others pay is a basic requisite of fairness that pervades most legal systems. Again, there is an irony here, given that the Austrians rely so heavily on the law. It turns out that their concept of the law differs markedly from the one that embeds fairness and justice. For Coase and

<sup>14</sup> <https://ukcop26.org/glasgow-leaders-declaration-on-forests-and-land-use/>.

Hayek (and Nozick too), the law is the enforcement of contracts and hence property rights. Fairness and justice demand much more. They do not take the property rights as given.

Fairness and justice are critical parts of social capital. We do not want to pay the criminal protection money in order not to steal or murder. We assign the duty not to harm others a central role in a civilised society. This general legal principle is supported by consideration of capabilities and the interests of the poor. Pollution tends to have its biggest impacts on those worst-off in society. Air pollution damages the lungs of the urban poor most, and hence physically stunts their ability to fully participate in society. Slum dwellers around the world live among the waste, rubbish and sewage of the rich. The Mafia's attitude to pollution and its cannibalisation of waste industries plays out most forcibly on the poor who cannot avoid living with the immediate consequences. The polluter-pays principle, as a reflection of the demands of justice, is therefore a candidate for constitutional protection.

The argument could be extended. The job of the state is to protect and enhance nature as the key system infrastructure, as a core capability for citizens, not only because it is efficient to do so, but also because of fairness and justice considerations. This is a key part of Sen's theory of justice we met in chapter 2. Clean air, clean water and access to nature are essential, and the state should prevent the pollution of air and water, and the destruction of biodiversity, because its prevention aligns with justice to all citizens. Making polluters pay is in consequence an essential function of the state, and one that is very recent, as the world's population has grown and the environment has deteriorated.

Making polluters pay is really radical and would result in radically different prices. This would, in both the conventional and Austrian worlds, transform the environment. Consider how land use might change. In many developed countries farmers are heavily subsidised, and some polluting agricultural methods benefit from these subsidies. Farmers argue that if we want them to reduce fertiliser and pesticide use, protect the carbon in the soils and generally protect nature, we have to pay them to do so. They own the land and hence claim the right to pollute. They demand a Coasian bargain from the taxpayers, and have built very powerful lobbying organisations to hammer this home.

Imagine if the carbon content of fertilisers is taxed, and the biodiversity loss caused by pesticides is charged to the chemical producers. The prices to farmers of fertilisers and pesticides would go up. Imagine, too, if the emissions through carbon loss from the soils and peatlands were taxed at the same rate as emissions from power stations, creating a common price of carbon. Costs would go up, farmers would switch to lower-input technologies, and their pollution of the atmosphere and the damage they inflict on biodiversity would fall too. Because food prices would rise, consumers would have a lower overall level of aggregate consumption.

The shock in both energy and grain prices caused by Russia's invasion of Ukraine and the blockade of the Black Sea ports is a proxy for such pollution taxes in raising energy and food prices, and explains why there need to be supporting policies to protect the poor, disproportionately hit. The increase in energy prices has in turn increased the costs of fertilisers and pesticides and caused a reduction in these inputs. Crops are less fertilised and less heavily sprayed. The increase in the underlying fuel costs is a rough proxy for a carbon tax.

Consider a UK example of how radical the impacts might be. Ceasing farming on some of its most productive land in the peat-rich Fenlands might follow from a carbon pollution price. Even at a low price of carbon, the peat lost, blowing off this land, is so great that when combined with a carbon tax on the fertilisers and the pesticides tax too, the carbon taxation might render some of the agriculture there uneconomic.<sup>15</sup> While almost all of the attention has been on emissions and overwhelmingly on electricity generation, largely to the exclusion of sequestration, a carbon tax would bring transport, heating, trees and soils into play.

## Setting Pollution Taxes the Austrian Way

Taxes are just ways of adjusting prices, but the way the taxes are set differs between those, on the one hand, who assume they can

<sup>15</sup> See A.R. Graves and J. Morris (2013), 'Restoration of Fenland Peatland under Climate Change', Report to the Adaptation Sub-Committee of the Committee on Climate Change, Cranfield University, Bedford, [www.theccc.org.uk/wp-content/uploads/2013/07/Report-for-ASC-project\\_FINAL-9-July.pdf](http://www.theccc.org.uk/wp-content/uploads/2013/07/Report-for-ASC-project_FINAL-9-July.pdf); and P. Landshoff (2020), 'The State of the Fenland Peat: Why Peatland Loss Is a Serious Challenge and What We Can Do About It', 21 May, [www.zero.cam.ac.uk/who-we-are/blog/state-fenland-peat-why-peatland-loss-serious-challenge-and-what-we-can-do-about-it](http://www.zero.cam.ac.uk/who-we-are/blog/state-fenland-peat-why-peatland-loss-serious-challenge-and-what-we-can-do-about-it).

calculate precisely what the pollution costs are, following Pigou, and those, on the other, who take uncertainty seriously, following the Austrians, respectively. Conventional economists, following Pigou, try to equate the social marginal costs of reducing emissions with the social marginal damages, coming up with an estimate of the ‘right’ Pigouvian price. The Austrians doubt that there is a right price because of the central role that uncertainty and lack of a defined future play in their mindset, as discussed in chapter 3. Instead of trying to get the ‘right’ answer straight away, they could go for an initial tax and see what happens (provided of course they are not seduced by Coase’s argument). This is in effect *learning-by-taxing*, experimenting in a fog of uncertainty to learn from the market reaction. The wider the coverage of the tax, the more consistent the learning-by-taxing will be.

In the carbon tax case, the strategies are very different. The Pigouvians try to estimate the social cost of carbon by estimating the marginal damage of carbon emissions, as against the marginal costs of abatement. The Austrians could instead set an arbitrary carbon tax, and let the market then reveal these marginal costs and damages, and then iterate a better approximation that meets the targets.

A third option is to create new property rights in carbon, effectively making it a private good, and then the Coase process of bargaining might work as polluters bought and sold the permits. The advantage of the tax over the permits is that, as the consequences are observed, the tax can be adjusted, whereas adding or reducing the number of permits may prove more difficult.<sup>16</sup> Worse, the political attraction of manipulating the issue and circulation of permits is much less transparent than simply changing the taxes. The permit approach is much more prone to lobbying than taxes are. This difference can be seen in comparing the actual volatile prices in the EU emissions trading scheme (EU ETS) with the smoother price that a carbon tax would yield.<sup>17</sup>

<sup>16</sup> See on EU ETS [https://ec.europa.eu/clima/eu-action/eu-emissions-trading-system-eu-ets\\_en](https://ec.europa.eu/clima/eu-action/eu-emissions-trading-system-eu-ets_en); and A.D. Ellerman, V. Valero and A. Zaklan (2015), ‘An Analysis of Allowance Banking in the EU ETS’, Working Paper, EUI RSCAS, 2015/29, Florence School of Regulation, Climate, <https://cadmus.eui.eu/handle/1814/35517>.

<sup>17</sup> See graph on EU ETS since its inception: <https://tradingeconomics.com/commodity/carbon>.

## Pollution and the Link to Living beyond Our Means

If, as seems a reasonable assumption, pollution across all major economies, indeed all economies, is excessive, and if this can be reduced by imposing pollution taxes so that prices fully reflect the environmental costs, then the aggregate consequence of pricing pollution will be to reduce demand for pollution-ridden products, and this will add up to a reduction in total demand. The standard of living will go down, so that we live within our sustainable means.

The reason why consumption goes down is because we – the citizens and the consumers – are the ultimate polluters. In the example above, raising input prices for things like fertilisers, pesticides and fuel to farmers raises their costs. The farmers are not polluting for their own sakes, but in response to the incentives they face. They are polluting for us, the consumers. We pay less for the food produced by the chemical applications, and the reason we pay less is that someone else – other citizens – ultimately end up on the recipient end of the pollution from the excess carbon and other emissions. It is easy to blame the supermarkets for pressing farmers to lower prices, but supermarkets are competing for our business. We buy 2-for-1 bargains, the cheapest intensively reared chickens and the cheaper imported meat. Supermarkets can sell only as much organic, high-welfare and low-environmental-impact meat as we are willing to pay for. The chickens and the imported meat are cheap because they do not internalise the pollution costs in their production.

The importance of this point cannot be overestimated. The polluters are us, the principals, and the oil and gas companies and the farmers are our agents. When people vote against increases in fuel taxes and food prices, they are voting to protect their polluting habits supported by the cheaper food and cheaper petrol and diesel. They are voting to make other people pay, those immediately affected by the pollution, and the next generation who will get the climate change. Not to pay for the pollution we cause is selfish. The consequences of that excess pollution which the absence of proper pollution prices causes cannot be escaped. That is one of the main reasons our environment is in a mess.

Some argue that a lower standard of living is not the inevitable result of pollution pricing because there will be revenues from the taxes and these can be recycled back to consumers, rather than to

governments, who can then spend the money on other things. Consumers will not necessarily be worse off. There can be a substitution effect without an income effect; we are not, on this argument, living beyond our means, but simply consuming the wrong things.

Whilst the spending of environmental taxes offers lots of opportunities, the ‘no-worse-off’ result is very unlikely for two reasons. The first is that there need to be comprehensive non-polluting substitutes available at an *equivalent* cost. But for much of our economic activities there are few if any substitutes. Consider carbon. It is true that electricity can be generated in low-carbon ways, but at higher costs compared with fossil fuels, despite the claims, primarily by interested parties, to the contrary.<sup>18</sup> Oil, in particular, is an incredibly useful high-energy-density fuel. Although the relative costs are disputed, and indeed may one day be lower,<sup>19</sup> the full costs of intermittent low-density wind and solar power, once all the costs of transmission, distribution, back-up and most importantly the minerals (cobalt, lithium, copper and nickel) are fully factored in (including all the pollution caused by their mining and refining), remain higher.<sup>20</sup> If the demand for electricity is inelastic, then the costs of the final outputs consumed will go up as a result of the pollution taxes. It is a similar case for transport. The carbon tax encourages investment in substitutes, but they take time. If and when substitutes are available *at no extra cost*, then few will pay the tax and the standard of living will hold up. In this nirvana, there are no climate change mitigation costs at all; it costs nothing to switch to net zero technologies, and all the subsidies, regulations and carbon taxes can simply be abolished.

The second reason why the no-worse-off result is unlikely is that the pollution taxes raise money needed to invest in the less-polluting technologies. Restructuring the economy takes time. It requires lots of investment and lots of new ideas and new technologies to bring forward low-carbon alternatives and to reduce their costs.

<sup>18</sup> See Helm, *Net Zero*.

<sup>19</sup> See Helm, *Burn Out*. The argument is that, as and when the world decarbonises, the demand for oil will fall, as will its price, as production is concentrated on low-cost resources, such as those in the Middle East. The marginal cost of oil from Saudi Arabia may be as low as \$5 a barrel, creating the result that the more successful decarbonisation is, the more competitive the fossil fuels become.

<sup>20</sup> On equivalent firm power auctions, see D. Helm (2017), ‘Cost of Energy Review’, Independent Review for the Department of Business, Energy and Industrial Strategy, October.

This is what can *in the end* increase the sustainable level of consumption – but not yet. Thinking more generally, and including all the damage done to the biodiversity and other dimensions of nature on top of carbon and other air pollution, leads to the conclusion that the lack of full and proper pollution pricing is one of the main ways our consumption outruns the environmental capacity to cope with it.

In order to meet the conditions for sustainable economic growth, we would need to internalise all the main externalities. This is a primary function of the state, and a grossly neglected one. It adds pollution pricing to the capital maintenance and enhancements of natural capital, and the provision of the core system infrastructures. It further aids the protection and maintenance of the natural capital assets and the natural system infrastructures since it reduces the harm caused by current economic activities. There would be less need for capital maintenance of natural capital assets because there would be less damage. A market economy will be efficient if the assets are maintained and enhanced, if the system infrastructures are in place, and if all environmental externalities are internalised at what would be the right prices.

When environmentalists, like for example James Rebanks,<sup>21</sup> rail against economists and blame them for the environmental damage, driven as they see it by the pursuit of efficiency, they equate efficiency with cost cutting, and they thereby display a deep ignorance about the critical role efficiency plays in protecting and enhancing the environment. Economics is about the allocation of scarce resources. Doing this inefficiently is not good for the environment. It is in fact very bad for both the environment and the people who will have to pay the cost of the pollution.

### **Polluter Pays in the Absence of Global Enforcement**

How can the polluter-pays principle work in the global context? Overcoming pollution between jurisdictions makes Coase bargaining even more difficult, since there is no agreed court to appeal to. Some very limited efforts have been made to shape international agreements, like the Law of the Sea, the UNFCCC and the Convention on Biological Diversity, but none is really enforceable. In the

<sup>21</sup> J. Rebanks (2020), *English Pastoral: An Inheritance*, London: Penguin Books.

Brazilian example, if other countries pay Brazil not to cut down more of the Amazon, how can they be sure that Brazil will stop, and, if it does not, what security for their payments do they have through courts?<sup>22</sup>

Since the two main environmental problems – climate change and biodiversity loss – have global dimensions (and in the case of carbon emissions the problem is completely independent of specific locations), global agreements and treaties depend on each country forgoing the obvious free-rider advantages. Pricing can, however, make an impression on the incentives. It is not possible to force a country to use an international pollution tax, but it can be applied to that part of domestic production that is exported and traded.<sup>23</sup> Suppose the UK and the EU unilaterally impose a carbon tax or an ETS on a territorial production basis but ignore imports. One way in which EU terrestrial emissions can be reduced is by ceasing domestic production and importing instead. That indeed is what has been going on with increased imports of carbon-intensive goods from, in particular, China. If the UK and EU impose a carbon tax or an ETS, and China does not, there is in effect an extra incentive to produce in China as its relative competitiveness will have been improved by the amount of the tax. It is a perverse tax when production and transport from China are more carbon-polluting than production in the EU. It is in effect a pollution subsidy to China in our example.

The answer in this case is to apply the pollution tax to *all goods consumed in the UK and the EU*, regardless of the location of their production, in recognition that it is consumption that is the cause of the pollution, regardless of where it is produced. There would be exemptions if China imposed a carbon tax similar to that in the UK and the EU, and China would be incentivised to do so because it would then keep the tax revenues rather than pay them to the UK Treasury or European Commission. It is an obvious way to extend the pollution tax beyond the borders of a specific country, and thereby engender some further cooperation, without resorting to the ineffective Coase bargaining. There might still be diplomatic pressure where there is multiple and mutual engagement between states, but the payoffs may

<sup>22</sup> See Dasgupta, 'Final Report – The Economics of Biodiversity'.

<sup>23</sup> It could also be made a requirement of a future revised World Trade Organization trade deal.

be sufficient to offset these in other areas. The EU has finally proposed a carbon border adjustment mechanism, making this a live policy option, rather just than a threatened idea.<sup>24</sup>

If fully implemented, citizens of the EU would genuinely no longer be causing climate change if and when they reach net zero. But otherwise, on a carbon territorial production basis, they will still be causing climate change, as they would be in the UK without a border tax. Whilst it is not true, in the words of John Gummer, chairman of the CCC, that ‘by reducing emissions produced in the UK to net zero, we also end our contribution to rising global temperatures’, it would be true if carbon taxes were applied on a consumption basis, including imports.<sup>25</sup>

### **Why not Regulate and Prohibit Polluting Activities?**

The striking feature of the above discussion about making polluters pay by pricing our pollution is that so far it is not the main way in which public policy has gone. There are very few pollution taxes, and very few assignments of property rights. Instead, the overwhelmingly dominant approach is to use regulation: for the state to define how much pollution is to be allowed, and which things to ban. It reflects our preference not to be explicitly confronted by the costs of the pollution we cause by our consumption with in-your-face taxes.

It is easy to see the appeal of regulation. It provides a sense of certainty, especially when it comes to banning products. It allows experts (economists) to pick the ‘right’ answer, using cost–benefit analysis. Banning things has a reassuring certainty. The EU has had bans on GMOs, neonicotinoids and a host of chemicals. For others, it sets ‘acceptable’ limits. Drinking water must not contain more than  $x$  amount of a variety of chemicals, bathing beaches must meet a list of minimum conditions and car exhaust emissions must be below specified levels.

<sup>24</sup> See European Commission (2021), ‘Proposal for a Regulation of the European Parliament and of the Council Establishing a Carbon Border Adjustment Mechanism’, COM(2021) 564 final, 14 July; and for the more general argument for border taxes, see Helm, Hepburn and Ruta, ‘Trade, Climate Change and the Political Game Theory of Border Carbon Adjustments’.

<sup>25</sup> Climate Change Committee (2019), ‘Net Zero: The UK’s Contribution to Stopping Climate Change’, May, p. 8, [www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/](https://www.theccc.org.uk/publication/net-zero-the-uks-contribution-to-stopping-global-warming/).

There are two general objections to this regulatory approach. The first is that it is open to capture by lobbyists and vested interests. The second is that the state is in an informationally very inferior position compared to the market.

The history of capture of regulatory standards is long and detailed. Take two current examples: the proposed ban on the use of peat in horticulture; and the treatment of biomass as a renewable energy. In the peat case, the damage is well known, comprising emissions, the loss of carbon sequestration, biodiversity losses and impacts on water retention and flooding and on water quality,<sup>26</sup> and yet it is widely used in the horticultural sector as a compost and potting material. As we keep repeatedly noticing, lobbying plays a big part: the industry says it is taking voluntary measures, and protests that there are not good substitutes readily available, and many gardeners carry on using it, or buying plants grown in it. Why, if regulation is the preferred route, is this not simply banned in both cases? Why rely on voluntary steps by the polluters? Belatedly, the UK government is going to ban the *domestic* use of peat.<sup>27</sup>

Biomass benefits from considerable subsidies, and there are deep vested interests bent on capturing these subsidies. Take the burning of wood pellets in power stations. The emissions are exempt from carbon taxes and permit requirements, and the burning itself is subsidised. Biomass has been making up over 50 per cent of all claimed renewables in the EU, and its status as being in the renewables class yields considerable economic rents.<sup>28</sup>

The uncertainty leads to decisions that have unintended and unanticipated consequences and reinforces capture by the lobbyists with specific superior information. For example, the regulation of bio-fuels in the EU has mandated that a proportion be included in fuels for vehicles. The fuel of choice has been made from palm oil, itself

<sup>26</sup> Peat has also been used extensively as a fuel in power generation in Ireland. See [www.seai.ie/data-and-insights/seai-statistics/key-statistics/electricity/](http://www.seai.ie/data-and-insights/seai-statistics/key-statistics/electricity/).

<sup>27</sup> The UK government has recently changed its position on peat. See [www.gov.uk/government/news/sale-of-horticultural-peat-to-be-banned-in-move-to-protect-eng-lands-precious-peatlands](http://www.gov.uk/government/news/sale-of-horticultural-peat-to-be-banned-in-move-to-protect-eng-lands-precious-peatlands); and [www.wildlifetrusts.org/news/governments-set-low-bar-phase-out-gardeners-use-peat](http://www.wildlifetrusts.org/news/governments-set-low-bar-phase-out-gardeners-use-peat).

<sup>28</sup> The Drax power station in the UK is paid subsidies indexed in real terms through to 2027, for example, equating to just under £1 billion per annum. See graph of the growth of DRAX subsidies over time at <https://ember-climate.org/insights/research/subsidies-for-drax-biomass/>. Its emissions from burning the pellets are exempt from pollution charges, and these emissions do not count against the net zero target.

produced by clearing existing forests, notably in South East Asia, and sometimes grown on peat soils. The strong regulatory pressure towards diesel rather than petrol because of emissions regulation led to serious unintended public health damage through air pollution, notably in urban areas. Palm oil and diesel are dreadful examples of the perverse impacts of well-intentioned policies.

In the US and the EU, these regulatory rules and their formulation are the outcome of processes conducted by institutions that have an element of transparency, though in the US the environmental administration leads are appointed by each president and hence there is always a key political element. These blemishes pale into insignificance when compared to those in authoritarian regimes. The cases of Russia and China show what happens when regulation is overtly political in the absence of an independent legal system capable of enforcing the law and the constitution. It is no accident that Russia and China have such terrible environmental outcomes.

## **Better Prices**

Prices are the key way in which information about costs is transmitted in an economy. They matter to firms in revealing the costs of inputs to producers, and to consumers in revealing the costs of production. The gap between the two is profit, and it is the possibility of excess profits that motivates entrepreneurs. All compete for prizes. The Austrians are right about this.

Prices are never perfectly right. Economies are riddled with imperfections. They can be improved upon, without trying to perfect them. The most glaring gap in prices is pollution, and if pollution costs are not reflected in prices, the economy will be an unsustainable one. Pricing pollution is a necessary condition for the sustainable economy. The polluter should be made to pay. In the case of renewable natural capital, the prices applied to the services provided by these assets should be set so as to stay well above the thresholds, and indeed above safe limits, to prevent the loss of the benefit, not just now, but in perpetuity. This applies to species, habitats, ecosystems and, of course, to carbon emissions and sequestrations. The gap between the economic efficient outcomes and our unsustainable pollution is consequentially immense.