

# 10 DELIVERING THE SYSTEM PLANS

The core system infrastructures of the economy have to provide the USOs. As natural monopolies, in whole or in part, and with low to zero marginal costs, they cannot be left for themselves to decide how best to meet the objective of leaving the next generation with a set of assets at least as good as it inherited. The state needs to regulate them. Regulating the systems of the sustainable economy requires not only ensuring that the systems are properly maintained and efficiently run, but also that they are resilient to shocks, particularly environmental ones. There is also the public decision as to how to allocate their costs. The boards of private companies cannot decide what is in the public interest or who should pay what.

Post-Second World War regulation was straightforward. It was internalised inside government across Europe and the UK. The state owned the infrastructures and told them what to do. The boards answered to ministers. Though much was achieved in providing the assets to underpin the great era of post-war growth, the trouble with this model is that the nationalised industries became tools for the achievement of particular short-term political objectives, and these were focused on the general election cycles. They ended up being less than perfect in pursuing the public interest.

The job of politicians is to win elections; it is not solely to achieve the overall objective of maintaining and enhancing assets. This has a particular twist, biasing decisions to the short run: utility prices

impact on voters, and specific investments take place in key political constituencies. Unsurprisingly, the overall short-term spending took priority over capital maintenance and longer-term investments.

That for the most part the nationalised industries did build the power stations, motorways and the national gas system, keeping up with and supplying the golden age of economic growth, should not however be forgotten, and did so on a pay-as-you-go basis and hence closer to the sustainable economy rules. Whilst it remains fashionable to decry the nationalised industry model, it is not clear that it was actually worse than what followed.<sup>1</sup>

In the 1980s, as privatisation unfolded and the nationalised approach was largely abandoned, regulation came to mean the regulation of the now private monopolies, and the promotion of competition. The new mantra was: ‘Competition where possible, regulation where necessary.’ Investment, operating costs and strategy moved to the control of managers of the companies, directed by their private owners, subject to the rules about the outputs and the delivery of required services. The question was no longer (if it had ever been) how to be good stewards of the assets, but rather how to limit the abuse of market power, by price caps and by competition. The role of the state became overwhelmingly negative, leaving the private sector to decide what to build, and how to maintain assets. There was an explicit abandonment of system planning.<sup>2</sup> The questions became focused on incentives for maximum cost efficiency.

The results have not lived up to the ambitions of privatisation. Profit-maximising private utilities have, unsurprisingly, not prioritised asset maintenance and enhancements. The consequence is apparent across many developed countries. The transport, communications, energy and water systems are generally not fit-for-purpose. This matters at any time as part of the intergenerational bargain, but it matters more so now as climate change and biodiversity loss alter the constraints on these systems.<sup>3</sup>

<sup>1</sup> The US also achieved these outcomes, using rate of return regulation of predominantly private companies. In all cases, natural capital took second place and suffered accordingly.

<sup>2</sup> See N. Lawson MP (1982), ‘The Market for Energy’, speech to the British Institute of Energy Economics, Cambridge, June, reproduced in D. Helm, J. Kay and D. Thompson (eds.), (1989), *The Market for Energy*, Oxford: Clarendon Press.

<sup>3</sup> On water, see D. Helm (2020), ‘Thirty Years after Water Privatization – Is the English Model the Envy of the World’, *Oxford Review of Economic Policy*, 36(1), 69–85.

If the objective is to provide citizens now and in the next generation with the assets so that they are free to choose how to live their lives, and if this includes limiting climate change and biodiversity loss, and is best seen through the lens of the core systems that provide the capabilities, then the practical question that regulation has to answer is how best to make sure the maintenance and enhancement of the underlying assets, whether privately or publicly owned, are carried out. Regulation becomes positive and proactive, ensuring system plans are delivered, so that the intergenerational objective of the sustainable economy's first principle is met.

### **The System Regulation Model**

The systems approach points to system regulation, to provide an overarching coherence within and between the infrastructures. It is a very much more integrated, and longer term, approach, very different from the atomised competition model, and the unbundling and disaggregating of the networks.

For all the main systems, there needs to be a 'plan' as to how to meet the first principle of the sustainable economy and a prime role of regulation is to make it happen. Turning a monopoly into a competitive market will not deliver the required results because these are natural monopolies with long lifespans, significant externalities and elements of public goods. The citizen has rights to the USOs, and is not just a consumer with a budget constraint responding to prices set in competitive markets.

The plan has to take account of multiple outputs and multiple periods, bearing in mind the secondary principles of polluter pays and precaution. It needs to be a plan for the short run, the medium run and the long run. The short run is about matching demand and supply at each instance, ensuring resilience with enough spare capacity.<sup>4</sup> It is about operating efficiency, not investment (which in the short run is fixed), and it has been the focus of the fixed-price, fixed-period regulation in the UK pursued by Ofwat, Ofgem and the other offices for sectoral regulation over the last three decades. Ironically, this replicates the short terms of the political cycles in the nationalised industries noted above.<sup>5</sup>

<sup>4</sup> It is Alfred Marshall's short run, when the capital stock is fixed.

<sup>5</sup> It is an unhappy feature of water regulation in the UK, for example, that the periodic reviews happen to coincide with the build-up to general elections, adding a further short-term bias.

The medium term is about the decade-long outlook, and largely about investment *within* the existing structures of the systems. It is about upgrading sewerage works, about new platforms at train stations, and about roundabouts and road extensions and accommodating electric car charging networks. It is about augmenting, improving and decarbonising the *existing* systems. Technology is largely given, subject to incremental improvements, so it is capital maintenance and remedial investments for the sustainable economy.

The long run is about the choice of system and it is the most important for the sustainable economy. In energy, it is about a partially decentralised largely net zero system, based on digitalisation, Big Data and AI, new generation, storage and demand-side technologies, and about the integration of transport, heating and agriculture into the energy sector, as they electrify. It is about technological change. In real time, this may be a matter of a few decades or indeed even within a decade. The long run is now forcing itself into the medium- and short-run time horizons, given both the speed of technical change and the urgency of net zero and the protection of biodiversity.

The system plan needs to have all these dimensions, all taking natural capital fully into account, and not just the short term that the current price cap regulation is mainly focused on. Five-year price caps tend to neglect the medium and longer terms. To make sure all three time dimensions are put together consistently, some general accounting rules need to be applied. These are the rules which ensure that the overall objective of the sustainable economy is met. These accounts, which we met earlier in chapter 4, have two key elements, capital maintenance and capital enhancements, and both need to be reflected in each of the system balance sheets, and then aggregated into the national accounts and the national balance sheet. These are not the same as the company accounts of the existing utility businesses, many of which were based on historical cost and depreciation, and which often cover only the parts of the systems the specific companies are responsible for. They are also not the same as regulatory accounts which the utilities are required to produce. They are the system accounts, incorporating *all* the system assets, regardless of who owns them.

## Knowing What You Have Got

In order to know whether capital maintenance has been sufficient and to measure the impact of enhancements, there needs to be a baseline,

showing what system assets there are and what state they are in. It is a massive advantage to this system regulation model that new digital technologies make this task much easier to carry out, and to repeat ad infinitum.

The starting point is natural capital and its ecosystems. This can be set at the national (and even global) level as the overall baseline.<sup>6</sup> Renewable natural capital as a whole has to be prevented from declining as the most basic necessary condition to ensure that the overall objective of the first principle is met. The baseline is a measure of assets, not flows, although flows can be helpful indicators. If the pollution load in a river goes up, it tells us that something is fundamentally wrong with the assets, the rivers through which the pollution flows.

A natural capital baseline reads off from satellite data and, where appropriate, drone and on-the-ground information, mapping the assets and identifying what condition they are in. It measures the trees and the soils, the peat and the rivers and water bodies, and the recreational assets; it creates layered natural capital maps which can be re-run at regular intervals to see how well the underlying assets are doing.

Similar exercises can be undertaken for the physical assets, assessing the condition of the bridges, ports, railway tracks and the electricity pylons, and so on. For the less tangible assets, the state of human capital in each sector can be surveyed, looking at the quality of the workforces. Baselineing social capital is much harder, though there are proxies for measuring trust, and lots of data on crime.

We can now know a great deal more about all the critical systems, all the time, and as the data is continually augmented and updated, our detailed knowledge gets better and better. This is a massive advantage in designing, maintaining and enhancing the sustainable economy. It is remarkable that baselineing and, in particular, the use of new technologies to map utility networks and assess the conditions, is so far largely a foreign land to regulators. It is a remarkable fact that none of the existing utility regulators in the UK does almost any of this, and the UK Environment Agency lacks proper digital mapping. Even more remarkable is how little system digital mapping is done by the utilities themselves. Some UK water companies do not have even the most primitive data about their pipes and sewers, and hence do not understand leakages and raw sewage discharges.

<sup>6</sup> This is the obvious starting point for the twenty-five-year environment plan.

A sophistication of the plan is to check resilience: how well the systems can cope with shocks. It is possible to remotely identify risks to resilience, like trees overhanging power lines, and to spot damaged train rails and road potholes by continual remote sensing.<sup>7</sup> Resilience scenarios test whether, if there is a prolonged heatwave, there will be enough water, and whether the rails will buckle. These can all be simulated as scenarios against the baselines, in multiple stress tests, continually repeated and updated in real time. Yet another remarkable fact is that, in the context of the 2022 failure of nearly half the electricity supply companies in the UK, not even proper financial stress-testing had been carried out.<sup>8</sup>

## The System Regulators

The plans need to be developed and updated, and someone has to do this. Under price cap regulation, this is typically subsumed into the short-term (five-year) business plans. The privatised companies have licences which dictate the very general outputs they have to deliver, such as clean water, security of electricity supply, and so on. It is left to the companies to decide how best to achieve them, and to put together business plans for the next five years which their directors believe will fulfil their licence conditions. The regulator then comes in and challenges the companies, mainly on their efficiency assumptions and the cost of capital.<sup>9</sup>

In the system regulation model,<sup>10</sup> the licence conditions for outputs are transferred from the private companies to the system regulator. The latter then has the duty to ensure that the assets are maintained, to work out from the plan the enhancements required and

<sup>7</sup> This would no doubt have identified the impending disaster that Storm Arwen in November 2021 would cause to the electricity distribution networks in Scotland and the north of England, where the trees that should have been trimmed back fell on the power lines.

<sup>8</sup> Ofgem commissioned its own inquiry into its failures, and unsurprisingly it was somewhat bland, [www.ofgem.gov.uk/publications/ofgem-publishes-report-its-regulation-energy-market](http://www.ofgem.gov.uk/publications/ofgem-publishes-report-its-regulation-energy-market).

<sup>9</sup> Indeed, it is revealing that the National Infrastructure Strategy introduced in November 2020 devoted a whole chapter to resilience – implicitly recognising that this area had been neglected. HM Treasury, ‘National Infrastructure Strategy: Fairer, Faster, Greener’. Also, Ofwat, in its 2019 price review, stressed financial rather than physical and environmental resilience. See Ofwat (2017), ‘Ofwat’s Price Review: Delivering More of What Matters. Our Final Methodology for the 2019 Price Review – Executive Summary’; (2017), ‘UK Government Priorities and Our 2019 Price Review Final Methodology’; (2017) ‘Welsh Government Priorities and Our 2019 Price Review Final Methodology’, 13 December.

<sup>10</sup> See D. Helm (2019), ‘The Systems Regulation Model’, 12 February, [www.dieterhelm.co.uk/regulation/regulation/the-systems-regulation-model/](http://www.dieterhelm.co.uk/regulation/regulation/the-systems-regulation-model/).

ensure that these are delivered. The privatised companies are one way of getting this done. They become the contractors to achieve the system outcomes that the plan sets out, all consistent with the overarching objective of the first principle.<sup>11</sup>

The domains of systems are not the same as the current licence coverage of the privatised utilities. They cover *all* the main activities within the system, not just some. In water, for example, the current approach separates out flood defence and land use through agriculture from the water and sewerage companies, and from the surface drainage parties like the highways.

The overall duty of the system regulator in the water case is focused on the river catchment *as a whole*, within which the parts are set, rather than distinct and separately regulated silos, as at present. In England and Wales, Ofwat regulates the water companies, the Department for Environment, Food and Rural Affairs (Defra) and the Treasury oversee the Environment Agency, and a series of institutions covers farm subsidies. The Office for Environmental Protection holds Defra, the Environment Agency, Natural England and indirectly the water companies to account against statutory environmental targets. In the UK, in electricity and gas there is one regulator for the economic activities, Ofgem, and separate regulators for air quality and emissions trading, separate nuclear regulation, as well as a system operator for transmission, now to be separated out. Hydrogen, offshore and onshore upstream oil, gas and coal all come under different (and sometimes overlapping) regulatory bodies. Whilst pragmatism dictates how these system-wide plans are implemented, the wider system domains remain a central organising concept and focus for the sustainable economy. This would be a radical departure from the current institutional arrangements. It would dramatically simplify regulation and cut back administrative costs.

The system regulators have to be in the public and not private sectors. They are assigned the public duties, and these have to be delivered independently and impartially. The companies themselves have vested interests, and there are different ways of cutting up their own business plans to best maximise their profits. This matters because otherwise there is a large principal-agent problem between the state and

<sup>11</sup> This model is already applied to electricity generation, where bidders compete for contracts.

the private sector. It is not just that the objectives differ (public versus private interests), but there is also a sharp informational asymmetry if the private sector in effect decides on the plan. Capture is an ever-present damage to avoid through institutional design.

It has been suggested that one way around this within the existing regulatory structures is to try to make the boards of the private utilities incorporate wider ‘stakeholders’ representing other interests beyond narrow profits. Why not appoint an environmentalist, or have an advocate for the environment on the board, someone whose priority is the sustainable economy? Why not add a former regulator, who will take a broader view, or a consumer champion who will look to the customers’ interests?<sup>12</sup>

This is the sort of structure that ‘stakeholder capitalism’ advocates promote. It is very popular with environmentalists and finds its most recent incarnation in the financial markets’ fashion for ESG. If we get all the interests round the table then the boards of the private companies will choose outcomes consistent with the public interest.

This is a dangerous illusion, and for lots of reasons. The overall objective of maintaining and enhancing the assets is not the result of a summation of the wishes of the various interests. It is a hard, largely empirical exercise, requiring expertise. The stakeholders themselves will have their own interests. We are yet again back to lobbying and the risks of regulatory capture, and with the switches from gamekeeper to poacher, from regulators to the regulated, and sometimes the other way around.<sup>13</sup>

There is a democratic question here too: stakeholders are not elected, and they are not accountable to ministers, parliament or the electorate. Their interests are not equivalent to those of citizens. They are accountable to the companies and the company boards on which they sit and, particularly where they are non-executive, their futures can depend on the chair and chief executive officers. The chair may have particular pet projects, the chief executive officer may want a specific legacy, and the board is often shaped with this in mind, rather than

<sup>12</sup> In the case of ex-regulators, this is the ‘revolving door’ problem.

<sup>13</sup> Examples of careers in respect of senior positions at Ofwat include Jonson Cox, chair of Ofwat, who was previously Chief Executive Officer of Anglian Water; Cathryn Ross joined BT and then Thames Water after being Chief Executive of Ofwat; and Rachel Fletcher joined Octopus Energy after being a Senior Partner at Ofgem and Chief Executive of Ofwat.



the board leading and the company executives following. The state of our rivers, energy systems and the roll-out of fibre networks should not be decided by these unelected individuals. The companies are there to deliver the outcomes, not decide what they should be. None of this suggests that the various interested parties should not *contribute* to the system plans; it is just that they should not *decide* their contents. They should be consultees, not decision-makers.

The system regulators are public bodies, with public duties, many of which are currently in the private companies' licences. Their primary interest should be to ensure the system plans are delivered and that polluters pay and public goods are provided. In the sustainable economy, it is the responsibility of the system regulators to ensure this, not the responsibility of unaccountable 'stakeholders'.

## The Delivery of the Plan

System regulators have the duty to develop and implement a system plan for the short, medium and long term. The way the plan is assembled and revised should be transparent. A website open to all citizens is an obvious part of this process. The development of the plan and its evolution can start with guidance from the government of the day, the guidance itself subject to parliamentary scrutiny and approval. This should all be within a constitutional context which protects the interests of future generations, set out in the next chapter.

In some cases, this is straightforward. For example in the UK, all sectors need to have regard to the Climate Change Act 2008 and the 2019 net zero amendment. The statutory targets under the Environment Act 2021 will also be requirements, not options. Other components require judgements about the ways in which the first principle can be met, in the context of the capital maintenance requirements and the overall opportunities for enhancements. This could be made a legal requirement in a new Systems Regulation Act, as part of the legislation needed to set up the system regulators.

With the plan uploaded to the website, with continuing opportunities for contributions and amendments and with perhaps also an advisory group of relevant parties with technical expertise, each system regulator can start to break down the system requirements into manageable chunks. A good way to start is to list on the website all the capital maintenance and enhancement requirements consistent with the

sustainable economy and to invite initial expressions of interest for the delivery of any and all of them. This is an information-gathering exercise, and it is inclusive. There may be many businesses and organisations, including trusts and charities, that may be able to contribute to delivery. It is the right forum for the stakeholders, rather than through the boards of companies. It helps to build social capital by its inclusivity.

From the initial responses, the system regulators will learn a lot about who might bid, which bits are most attractive to whom, which bits will elicit lots of competitive bids and which bits might get little or no interest at all. This helps in designing the next stage: the rolling system auctions for those bits that are amenable to competitive bidding. This introduces an Austrian flavour to the system regulation: entrepreneurs can bring new ideas and new technologies to the virtual auction rooms. Some areas are obvious candidates for competition. Auctioned contracts for renewable electricity generation and auctioned capacity contracts in electricity have resulted in dramatic reductions in costs. Where they are possible, the great advantage of auctions is that they cut through lobbying and incumbent vested interests. They all have to make their bids. They enhance competition.<sup>14</sup>

Pragmatism is the order of the day. The system regulators will have different time dimensions and some contracts can be let for very short periods, and others for the medium and longer term. There will be a mix of contracts, and contracting will be a continuous process. This is actually much more like a competitive market: there are few, if any, examples where bundling everything in a single fixed-price, five-year period is efficient. In fact, it is very un-Austrian. Prices and contracts vary all the time in markets.<sup>15</sup>

## Residual Monopoly and Contract Regulation

Where possible, auctions provide a good way of both widening the number of possible providers while at the same time minimising costs. By focusing on outcomes, they take us away from socialist planning.

<sup>14</sup> But not always; auctioning large franchises in railways has not proved so successful.

<sup>15</sup> It is ironic that Michael Beesley and Stephen Littlechild, in proposing the RPI-X approach, thought that making final prices rigid in the five-year straitjackets was a good way of mimicking an Austrian market. M. Beesley and S. Littlechild (1989), 'The Regulation of Privatized Monopolies in the United Kingdom', *RAND Journal of Economics*, 20(3), 454–72.

But not all activities within a system will be amenable to competitive supply, and there will inevitably be residual monopoly elements. Some of these areas, such as the coordination of the particular bits of the system and the building of major new assets, could even be undertaken by competing potential suppliers. This is reflected in the fact that existing incumbent utilities subcontract many of their own projects.

The day-to-day system operation, as opposed to the system planning and auctions, can often be devolved to a single supplier. Take the operation of regional or national electricity systems. These require real-time matching of supplies with demand, and the ability to react immediately to problems in networks and power stations.<sup>16</sup> In the face of Russian interruption of gas supplies to Europe, operators have to game-plan possible emergency measures. This is not a job for a regulator, but for a specific operational company. It could be let as a limited-term franchise contract or more permanently remain with the network owner. The economic border of the state stops at system design and coordination; the private companies and other organisations can do the work.<sup>17</sup>

Similar considerations apply to natural capital and ecosystems, where design and coordination are critical. What is required is distinct from who provides it. The environmental objectives are not, for example, set by farmers and landowners. They get subsidies – contracts – to carry out environmental measures, but they should not decide what these measures should be. This distinction matters most where there are major landowners who want to be the ones who decide on landscape-wide changes, be it historically with sheep and the great Scottish Clearances, or the new ultra-rich who want to ‘rewild’.<sup>18</sup>

For some time and in some cases, perhaps permanently, there will still be a number of activities for which the current incumbents will be the only practical option. This means that there will be a central

<sup>16</sup> When, for example, a wind farm and a power station simultaneously dropped off the UK network in August 2019, the system operator had to come up with emergency measures both to maintain the frequency on the system and bring on other power stations. Ofgem (2020), ‘9 August 2019 Power Outage Report’, 3 January, [www.ofgem.gov.uk/publications/investigation-9-august-2019-power-outage](http://www.ofgem.gov.uk/publications/investigation-9-august-2019-power-outage).

<sup>17</sup> See Helm, ‘Cost of Energy Review’.

<sup>18</sup> See D. Helm (2022), ‘Natural Capital, Carbon Offsetting and Land Use: A Discussion Paper’, May, Scottish Land Commission, [www.landcommission.gov.scot/downloads/628de8eb9c11a\\_Land%20Lines%20Natural%20capital-carbon%20offsetting%20and%20land%20use.pdf](http://www.landcommission.gov.scot/downloads/628de8eb9c11a_Land%20Lines%20Natural%20capital-carbon%20offsetting%20and%20land%20use.pdf).

monopoly element for water companies, electricity and gas network companies, railway network companies and possibly for broadband at the centre of the communications sector. How to regulate these?

Price cap regulation for fixed periods is no longer appropriate under the system approach, for three reasons. First, the incumbents will no longer have many of the licence conditions, including the duty to supply. These are transferred to the system regulator. Second, the contracts are not best set as all-embracing five-year fixed-price ones. Third, the incumbents need not be restricted to narrowly defined activities, such as in electricity supply, networks and generation.

Taking each of these in turn, the transfer of the licence conditions to the system regulator in respect of resilience and security of supply (as well as other duties such as net zero, the protection of natural capital and the USOs) changes the role of incumbents from having responsibility for the system to having responsibility to fulfil a contract or contracts. These contracts are special only in their tailoring to the specific context. In wider markets where conditions dictate that there is only one credible bidder, it will be a negotiated contract, awarded on the basis of agreed rates of return. But even here, it is possible that other companies may bid for the incumbent contracts. For example, one water company may bid against another, and similarly for the energy networks.

The pluralisation of contracts is the result of having a system plan with a short, medium and longer term. The system regulator offers multiple contracts for different periods to ensure capital maintenance and planned enhancements, and can even invite initial bidders to specify the time period in their offers.

The third consequence of the system regulator having taken over the core licence conditions is that there can be a relaxation of the restrictions on companies' activities. The separation of network functions from other activities was necessary in order to home in on the specific licence requirements. This unbundling, which formed a big part of the creation of liberalised markets and the introduction of competition, was partly to avoid networks biasing investment to benefit their other activities, including the supply of services through the networks. This is no longer a problem in the system regulation model since the contracts are set by the regulator and the incumbents are at arm's length. The result is that these restrictions can be removed, and a single licence issued limited to ensuring that the contractors are fit and

proper to be engaged in core systems. The network operators in electricity, for example, can deploy their skills in storage and batteries, into demand-side investments and even into generation. They can be more Austrian. The silo approach can be abandoned, less and less relevant in a period of rapid technical change. The system regulator gets more control, there is more competition to do the works and there is more scope for innovation, while reducing the growing regulatory intrusion into the detailed activities of the private businesses. Regulation can thereby be reduced.

The problem in applying the system regulation model to both health and education is that the outputs are hard to specify with precision, and where they are, they can distort behaviour towards the meeting of measurable targets. No one appears to have any clear idea of the detailed capital maintenance requirements, or indeed the enhancements. Incumbent managers and staff campaign for more money, and political parties compete over who can spend the most, and employ the most nurses, teachers, police and so on. Repeated attempts to reform the school syllabus and to set targets for health outcomes and waiting times neglect the incompleteness of imposed contracts. Children's education is not measured simply by the number of top grades (especially when a very large proportion of any cohort is given top grades), and health outcomes are not simply gauged by the waiting times or how many tests are carried out. In both cases there is a caring function, tailored for each individual.<sup>19</sup>

The incompleteness of contracts does not stop progress. On the contrary, incompleteness makes a coherent system plan all the more important, recognising uncertainty, the possibilities of shocks like coronavirus and explicit budgeting for resilience. Both education and health need system plans, rather than tick-box targets.

## Generational Links

In most current models, regulation not only attempts to ensure the efficiency of the incumbent monopolies and to enforce the licence requirements on outputs, but also guarantees that the private companies can

<sup>19</sup> The fictitious 'Mr Chips' was not revered for the number of top grades his pupils achieved, but how he inspired them, their standards and the impact on the way they lived their lives – whether they were good citizens as well as exam-passing machines. J. Hilton (1934), *Goodbye, Mr Chips*, London: Hodder & Stoughton.

finance their functions. This is a critical element which helps to minimise the cost of capital, by ruling out the expropriation of investors by forcing prices down to the (relatively low or zero) marginal costs, rather than remunerating their (relatively high) average costs. Fixed and sunk capital costs are thereby guaranteed.<sup>20</sup>

When the companies were privatised in the UK, they took the core system assets with them.<sup>21</sup> These assets represented the past investments, which had been paid for in a pay-as-you-go fashion. Past consumers had paid for future assets, just as they had inherited the investments of their predecessors, right back to the Victorian sewers. At privatisation, this intergenerational chain was broken twice: once for the old assets; and again for new assets, which would be paid for through the repayment of debts by the next generation. In effect, the government sold the past (customer-paid) assets for a pile of cash, which it promptly spent on the current generation through lower taxes than would otherwise have been the case. It thereby violated core requirements of the sustainable economy and its first principle. Customers effectively paid twice.

The transferred assets went onto the private balance sheets and the regulators allowed these to earn a rate of return, reflecting the statutory duty to ensure that they could finance their functions. Since these investments had already been paid for by past customers and taxpayers, there is a good case to be made that these assets should have remained in the privatised accounts at an opening value of zero. The companies would then operate and maintain the assets, recovering their costs and making a return on new investments. It is the new investments that need to be protected from pure marginal cost pricing, and as the assets are enhanced, these are added to the RAB. The RAB should then be a core contract between the generations.

A problem the RAB assets cause to the system regulation model is in determining to whom they belong. There are several models. As new assets are created, they could stay with the incumbents, on their balance sheets, or they could transfer upon completion to the system regulators. The former limits the scope for auctions and competition

<sup>20</sup> It remains to sort out whether this is a guarantee that operating and capital maintenance costs will be covered from current revenues, whilst enhancements are covered by the duty to honour the resulting investment costs.

<sup>21</sup> The UK privatisation of the assets is different from the French example of letting franchises, keeping public ownership of the assets in a number of cases.

and entrenches the incumbents. The latter – as a build, transfer and operate model – creates assets on the public balance sheet, and in particular on the system regulators' accounts. This option is quite close to a nationalised industry with compulsory contracting-out of the works.

A third option is to create separate tradeable RABs.<sup>22</sup> These are placed into a holding company or similar vehicle, and debt-financed. Since the assets exist, they have an accounting value and the actions of managers can make no difference to these accounting numbers, so there should be no equity risk, which is transferred to consumers and taxpayers via the duty to finance functions. The debt is pretty close to government bonds since it has an implicit government guarantee and may be held mostly by pension funds.<sup>23</sup>

Now we have: the system regulators developing and implementing the system plans and auctions and letting contracts over the short, medium and long term; the creation of new assets by private companies; and the completed projects going into the RAB account and being refinanced with debt. The incumbent utility in effect 'sells' its completed new assets into the tradeable general RAB funds largely held by pension funds and other long-term infrastructure investment vehicles. The tradeable RAB fund represents the enhancement assets of the systems and is rather like a sovereign wealth fund. It in turn can be added to the national balance sheet, as a core element of the inter-generational bargain. From it, contributions are made to the citizens' dividend and hence to part of the basic income.

## Closing Down the Economic Regulators

The system regulatory model allows for a much cleaner and more consistent regulatory architecture for the state to exercise the relevant controls and to meet the requirements of the sustainable economy. This is both top-down and bottom-up.

The top-down dimension comes from a wider national infrastructure plan and its consistency with the overall planning regime. The

<sup>22</sup> D. Helm (2008), 'Tradeable RABs and the Split Cost of Capital', January, [www.dieterhelm.co.uk/regulation/regulation/tradeable-rabs/](http://www.dieterhelm.co.uk/regulation/regulation/tradeable-rabs/).

<sup>23</sup> Some existing utility debt has been bought by the Bank of England through QE. This is effectively what is going on in the UK in the RAB model being applied to new nuclear power stations.

sustainable economy requires an overarching long-term infrastructure plan for all the capitals – natural, physical, human and social. There have been a number of attempts to set out a national infrastructure plan, and often these have descended into a list of projects rather than an overarching coordination across the systems. In part, the failure to do this led to the setting-up in 2015 of the National Infrastructure Commission in the UK.

The bottom-up dimension allows for the clearing away of much of the regulatory bureaucracy that has emerged since privatisation in the late 1980s and into the 1990s. The numerous ‘offices’, one for each infrastructure system, have focused on the economic regulation of the specific monopolies, not the systems and not the environmental, social and other dimensions. In the system regulation model, they are not needed and can be closed down.<sup>24</sup> It adds to the bonfire of social security and taxation administration, which the basic income and flat-rate taxes facilitate, proposed in respect of social justice.

In the case of water, not only can Ofwat be closed down, but the production activities of the Environment Agency are separated out so they can compete for the catchment works (and probably best transferred out of the government sector), and the environmental regulatory function can be consolidated within a single regulatory body. This should be an Environmental Protection Agency.<sup>25</sup> In the case of energy and transport (and agriculture), the CCC provides an overarching set of carbon budgets, which the system regulators will need to meet. Both should be given the first principle as their overarching objective. The resulting clarity provides a blueprint for regulation in other countries.

## **Regulating the National Dividend and the Wealth Fund**

When it comes to the USOs, basic income and the national dividend, the regulatory issues here are partly technical and partly constitutional. The technical issues arise in the context of the definition of inflows and outflows.

<sup>24</sup> See Helm, ‘Cost of Energy Review’, on closing Ofgem.

<sup>25</sup> In practice, this is going to be partly the Office for Environmental Protection under the Environment Act. The relationship between the Office for Environmental Protection and the Environment Agency is unfinished business.



The easiest institutional model is of a national fund with a cash inflow and with an immediate cash outflow. The fund in this model, like many charities, is a collection and distribution agency. The technical questions are about deciding how big the national dividend inflow is, and the nature of the distributions both in timing and the entitlements.

Recall this is a *national* dividend, based on the assets on the national balance sheet. These include the assets directly owned by the state, and possibly the RABs guaranteed by the state. The fund could, for example, assume that the sustainable economic growth rate is around 2 per cent per annum, and apply this to the ring-fenced assets in the government's control or ownership. As the growth rate goes up, so too it might be assumed does the national dividend. An Oxford college might take 3 per cent from its endowment per annum as a dividend to spend on its current activities. Many charities with endowments follow a similar path, although some are more aggressive.

It might be reasonable to apply the expected sustainable economic growth rate to the state-owned assets and state-guaranteed RABs. It should in theory be close to the risk-free rate, the return on government bonds. Where the state owns assets but chooses to provide these free of charge, for example the health and education assets, national parks and a host of other public goods, the citizen dividend is still relevant. It is just that it is paid in kind, not cash. There should be an explicit account of this, and the citizens' annual dividend statement should set these out as, in this example, a notional return (after the capital maintenance has been met). It applies only to the returns on enhancements and enhancement investment, not to the existing assets, which are in perpetuity.

That leaves the determination of sustainable economic growth. It cannot be GDP, which is a flows concept and takes little account of changes in the value of the underlying assets or of the capital maintenance required. The national balance sheet with debt liabilities set against assets, and with capital maintenance deducted from current revenues, produces very different numbers to GDP.

An example illustrates some of the measurement issues. As a result of the coronavirus lockdowns, many economies increased borrowing to pay for current spending, including for example the UK's public payment of 80 per cent of wages through furlough. This financing increases the debt on the balance sheet, and is typically unfunded. It is current expenditure paid for by borrowing. Either public expenditure will have to fall, or taxes will have to rise in the future, net

of sustainable economic growth, by a sufficient amount to bring the current side into positive territory so it can pay off the balance sheet debt over time, or some form of default will be needed to write off the debt, whether outright or through inflation and currency depreciation. Selling off assets (as with privatisation) does not improve the position; neither does printing money.

In this example, it is obvious that we are all much worse off, echoing the point made by Robbins about the economic consequence of the First World War. The lockdowns have done *permanent* damage, and hence the *permanent* level of income and consumption consistent with asset value protection and proper capital maintenance is going to be lower. The national dividend should therefore be cut.

The problem is knowing by how much. One way of deciding the amount is to split the declared national dividend into two parts: a permanent income basic amount on a risk-averse basis (say 1 per cent), and an ex post payment adjustment in light of what actually happens. Given the scale of environmental problems that may happen this century, 1 per cent might actually turn out to be on the high side, so there would have to be some sort of clawback mechanism (as there would be for the Covid spending). If the outlook dims further, a mechanism might also be needed to cut the basic risk-averse amount. Conversely with, for example, rapid technical progress, it could be raised.

The above are all technical questions, and best dealt with by independent statistical bodies and a trust model of control over the fund itself, with legal protection under a constitution. These institutions will have to resist the inevitable political pressures. Politicians seeking re-election will want to pander to the immediate interests of their electorate. There will be inevitable pressures to paint a rosy picture of the economic prospects, talk up technical progress, talk down conflicts, pandemics and the possibilities of war, and try to raise the basic payment and increase the ex post payment too.

The distribution of the fund is straightforward provided it genuinely is on a per citizen basis, with no adjustments. It can be paid to the electoral roll on a fixed amount per annum (or quarterly or monthly to help low-income households with limited capacity to borrow and save to cope with fluctuations in their household budgets). There could be a cut-off above a certain income and wealth level (reflecting a modification to basic income). There are also decisions to be made about specific and special needs. These matters arise because

of citizens' different health needs, locations and other personal constraints. To avoid the fund trustees making these decisions, there are two options: government can pay for any additional social security and health needs directly out of additional taxation, independent of the national dividend and basic income payments; or the government could give public guidance. In the latter case, it is imperative that if some payments to some citizens go up, others go down. This will particularly need constitutional oversight.

The cash-in, cash-out model of the fund sidesteps the question about whether the dividend component of the basic income is too expensive. No taxes are raised. It is the surplus (or deficit) after taxes have been collected and expenditure deducted. Redistribution is about current taxes and current spending: the dividend is the citizens' share in the returns on the assets, and the assets facilitate the citizens' capabilities and the associated USOs. The dividend is ultimately a return on equity.

The risk of political interference is not limited to the pay-outs. Governments might try to get the fund to leverage itself and start investing in assets directly, making it a form of national investment bank.<sup>26</sup> This is indeed what happens in some sovereign wealth funds. It is, however, only a problem if the fund owns the assets against which leverage can be built up. The cash-in, cash-out fund does not itself have any assets; these belong to the state and the core system infrastructure owners in the form of RABs. Once the fund gets assets, its functions are different. In the sustainable economy, the state focuses on ensuring that the assets are maintained intact (a current spending obligation, of no relevance to the national dividend, since the dividend is net of the capital maintenance) and ensuring investment in asset enhancements that add to the balance sheet, net of the extra debt on the balance sheet to fund the investments. In the investment case, assets and liabilities go up, dependent on whether the investment turns out to deliver a positive economic return net of the cost of capital.

## **A New Institutional Architecture**

The institutional regulatory architecture of the sustainable economy is designed to separate out the overarching political choices from

<sup>26</sup> It might also seek to influence the choice of trustees, as US presidents do in proposing new appointments to the Supreme Court.

the effective delivery of the objectives and weights that the political process dictates. It is designed to have regard to the short, medium and longer terms. Of these periods, it is the longer term that is least likely to feature in political party rivalry and the immediate competition for votes. The institutions of the sustainable economy are designed to lean against the wind of short-term expediency, which promotes the consumption of current citizens without due regard to future citizens.

The system regulation model does just this. It starts with a set of accounting rules, separating out capital maintenance from capital enhancement, and all within the framework of a national balance sheet, independently constructed, updated and reported on. In this, it replicates the accountability and scrutiny of company accounts. The overarching national infrastructure plan fits into this accounting context. There follow the system plans, for catchments, regional and national energy systems, for road, rail and city transport infrastructures, and for broadband, fibre and mobile coverage.

These systems are all part of the national balance sheet because they are all underwritten by the state, whatever the formal property rights say. Ultimate control lies with the state, and indeed it is control that is one of the touchstones for accounting bodies in the allocation of assets between the private and public sectors. The question as to whether taxpayers or citizens as consumers pay is a subsidiary point, and less significant than it may seem.<sup>27</sup>

The health and education systems are part of the national assets and there is no reason why the same system regulatory approach should not be applied here, including a cost of capital requirement to represent the risks.

The overall returns on this portfolio of state-controlled assets, net of capital maintenance, are available as a dividend. This could go into a cash-in, cash-out fund, paid to all citizens as a basic dividend. The fund has to be independent of day-to-day interference, and to set an *ex ante* risk-averse dividend and an *ex post* correction. The amount paid may not be enough to take everyone out of poverty, but additional adjustments to income should come out of current revenues and hence taxation.

<sup>27</sup> During the coronavirus pandemic, it became clear that the state stood behind those systems and many of the companies in difficulty.

The citizen now has: USO provisions for natural capital, water, transport, energy and communications, and for health and education, plus an annual basic income dividend payment (topped up from taxation). These enable each to have the capabilities to participate in society, and provide the wider industry with the core inputs and routes to market, together with a labour force that is enabled to contribute to the national endeavour.

Putting in place institutional structures for the system regulators and the governance of the fund requires a new constitution, bringing the interests of citizens now and the next generation into the frame, all within the overall objective of maintaining and enhancing the assets over time.