



City Research Online

City St George's, University of London

Citation: Baines, J. & Hager, S. B. (2022). Profiting Amid the Energy Crisis: The Distribution Networks at the Heart of the UK's Gas and Electricity System. Common Wealth.

This is the published version of the paper.

This version of the publication may differ from the final published version. To cite this item please consult the publisher's version.

Permanent repository link: <https://openaccess.city.ac.uk/id/eprint/30019/>

Copyright and Reuse: Copyright and Moral Rights remain with the author(s) and/or copyright holders. Copies of full items can be used for personal research or study, educational, or not-for-profit purposes without prior permission or charge, unless otherwise indicated, provided that the authors, title and full bibliographic details are credited, a hyperlink and/or URL is given for the original metadata page and the content is not changed in any way. For full details of reuse please refer to [City Research Online policy](#).

Profiting Amid the Energy Crisis:

The Distribution Networks at the Heart of the UK's Gas and Electricity System



Joseph Baines &
Sandy Brian Hager
March 2022

Contents

Monopoly Capitalism	2
A Global Network of Ownership	7
Extracting Wealth	10
Concluding remarks: Casting a Spotlight	15
Endnotes	16

Executive Summary

Debates concerning the UK energy crisis have so far focussed on what policy changes are required with respect to [major energy suppliers](#) and [integrated oil and gas companies](#). Very little attention has been given to another group of important players in the energy system: the major electricity distribution network operators (DNOs) and the gas distribution networks (GDNs) at the heart of the UK's energy sector.

The DNOs and the GDNs play a vital role in controlling the distribution of gas and electricity from the National Grid to end consumers of energy: households and businesses. The sector is a [natural monopoly](#), meaning there are severe limits on the amount of competition that can be introduced to lower prices to consumers. As a natural monopoly, the DNOs and GDNs are regulated by The Office of Gas and Electricity Markets (Ofgem), which sets prices and is supposed to act in the interests of consumers and work towards environmental improvement and improved energy security.

This briefing examines the financial performance and ownership structures of these often-overlooked companies. It finds that the GDNs and DNOs enjoy the highest profit margins of any sector in the UK. Alongside extreme profit margins, the briefing also finds concentrated market structures: in the case of both gas and electricity distribution, just a small collection of companies have more than 90 percent market shares.

The research further shows that the DNOs and GDNs are part of a global network of wealth extraction, in which income generated from UK households' gas bills is channelled through to an assortment of tax havens, sovereign wealth funds, foreign pension funds, and some of the world's wealthiest individuals. These network companies pay out eye-watering sums to their owners: the dividend payments of the major DNOs totalled £3.6 billion from 2017 to 2021, and for the GDNs they amounted to £2.4 billion over the same period.

The analysis further identifies a less discussed channel for wealth extraction: interest payments on intercompany borrowing. These payments on debt owed to shareholders, parent companies and affiliates in the ownership network, like dividends, serve to enrich ultimate owners, even though the routes taken by interest payments to equity holders can sometimes be more circuitous. The interest payments on the internal debt of the major GDNs amounted to £928 million from 2017 to 2021, and totalled £842 million for the DNOs over the same period. Meanwhile the effective tax rates of the DNOs and GDNs are significantly lower than for the average company in the FTSE 100.

In the context of the energy crisis, and the wider cost of living crisis, the briefing argues that the DNOs and GDNs should be subjected to much greater public scrutiny. Given their extremely high profit margins and extractive business models, these companies must be front and centre in any conversations about windfall taxes and plans to bring the energy system back into public ownership. The analysis suggests that Ofgem has prioritised the financial returns of these companies over the financial security of British households strained by the rising costs of living. The gas and electricity distribution system in the UK is broken. It is high time for it to be overhauled.

Monopoly Capitalism

What is truly remarkable about the neglect of the GNDs and DNOs from debates about the energy crisis is the fact that they are by far the most profitable sectors in the UK. As Table 1 shows, electricity distribution is at the top of the list with eye-watering operating profit margins (operating profits / revenues) of 42.5%. Gas distribution is a close second in the table, with profit margins of 40.5%. Not even the private equity firms and major tech companies come close to reaching such levels of profitability.

Table 1. The Ten Industries with the Highest Profit Margin in the UK, 2022

	Industry	Profit Margin (%)
1.	Electricity distribution	42.5
2.	Gas distribution	40.5
3.	Private equity	34.7
4.	Open-ended investment company	33.8
5.	Search engines	33.6
6.	Commercial real estate	33.4
7.	Legal activities	33.3
8.	Water utilities	32.1
9.	Whisky production	31.2
10.	Audiobook publishing	31.2

Source: IBISWorld (2022)

The extremely high profit margins enjoyed by the distribution operators should not come as much of a surprise when we consider their business models and the regulatory structure that supports them. Starting with the GDNs, Cadent Gas controls distribution to around 11 million UK households and businesses in the East of England, London, North West England and the West Midlands. Scotia Gas Network controls the distribution of gas to 1.8 million customers in Scotland covering 75% of Scottish households, as well as almost four million customers in south-east and southern England, representing 90% of households in the region overall. Wales & West Utilities's catchment area - Wales and South West England - includes an estimated 2.5 million customers. Finally, Northern Gas Networks controls delivery to 2.7 million households and businesses in an area extending from Scotland's border to South Yorkshire.

DNOs are also organized in regional monopolies. UK Power Network Holdings controls the delivery of electricity to 8.3 million homes and businesses in the South East and East Anglia. The catchment area of Western Power Distribution covers around 7.9 million end-users in the South West, South Wales and the Midlands. Through its two subsidiaries - Scottish Hydro Electric Power Distribution and Southern Electric Power Distribution - SSE's distribution network encompasses 3.8 million customers in northern Scotland and southern England. Northern Powergrid Holdings controls the electricity distribution network in the North East

and Yorkshire with over 3.9 million customers. Through its subsidiary SP Distribution, Scottish Power has two million customers based in southern Scotland, and through its subsidiary, SP Manweb, the company has 2.5 million customers in North Wales, Merseyside and Cheshire. And finally, Electricity North West, true to its name, operates in northwestern England, with approximately 2.4 million end-users.

As a result of far-reaching monopoly control, these electricity and gas network operators account for 94% of revenues in electricity distribution and 94% of revenues in gas distribution, as shown in Table 2. The other firms, outside of the Big Ten distribution operators listed in the table, either operate in Northern Ireland or are fringe players in Britain, typically providing 'last-mile' connections to businesses and new housing developments.

Table 2. The Market Shares of the Major Gas and Electricity Distribution Network Operators

Company	Market Share (%)
<i>Gas distribution operators</i>	
Cadent Gas Ltd	46.30
Scotia Gas Networks Ltd	27.50
Wales & West Utilities Limited	10.40
Northern Gas Networks Ltd	9.80
Total of four companies	94.0
<i>Electricity distribution operators</i>	
UK Power Networks Holdings Ltd	25.5
Western Power Distribution plc	24.3
SSE plc	12.9
Northern Powergrid Holdings Company	12.5
Scottish Power Ltd	12.1
Electricity North West Ltd	6.7
Total of six companies	94.0

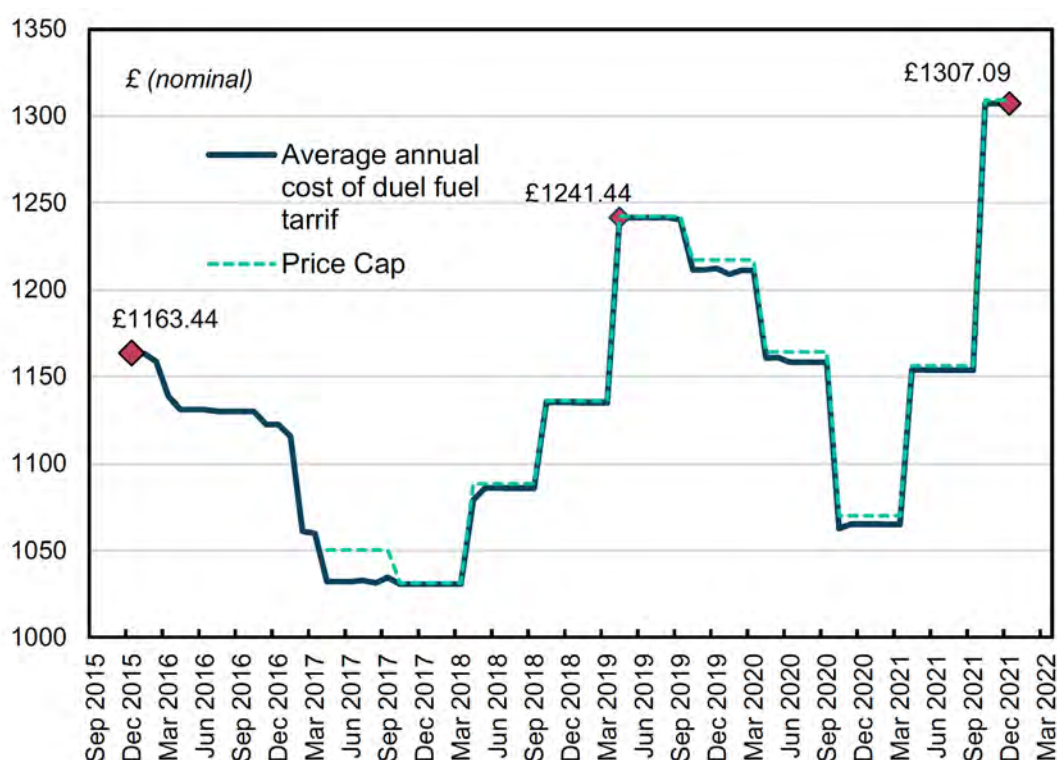
Source: IBISWorld (2021a, 2021b)

Given that tens of millions of households are captive to regional monopoly distributors of electricity and gas, one key part of Ofgem's remit is to ensure that these companies do not abuse their monopoly power by charging prices that are too high. Ofgem pursues this goal through setting price controls according to a formula that is designed to balance two goals: on the one hand, creating sufficient incentives for private investment in the UK's distribution infrastructure; on the other hand, safeguarding households' and businesses' electricity and gas bills. It is clear that such a balance has not been achieved. In its most recent [State of the Market report](#), published in 2019, Ofgem itself admitted that "the overall costs of the transmission and distribution networks to consumers... have turned out to be higher than they needed to be", and that "the majority of network companies are achieving profit margins towards the higher

end of our expectations for each sector”.

The last seven years of experience offer ample reason to believe that customers are indeed paying too much for gas and electricity bills and that this in part arises from the unduly advantageous regulatory conditions in which the GDNs and DNOs are operating. In fact, since Ofgem made its admission in 2019, conditions continue to be highly congenial for the major distribution operators while average gas and electricity prices have increased markedly. Figure 1 shows the price dynamics from December 2015 to December 2021 for prepayment tariffs. These prepayment tariffs cover 4.3 million users in the UK (about 15% of overall customers) (Ofgem 2019). Importantly, prepayment customers are more likely to be in vulnerable circumstances and experience fuel poverty. As we can see in the figure, while prices have both waxed and waned during this period, the general trend is upward, with the cost of the average prepayment dual fuel bill rising from £1163.44 in December 2015, to £1241.44 in March 2019, to £1307.09 in December 2021: a 12% rise in nominal costs over the entire period. And this, of course, is before Ofgem announced earlier this month that the energy cap will be raised by almost £700 for the average household.

Figure 1. The Annual Cost for Average Prepayment Standard Variable Dual Electricity and Gas Tariffs in the UK

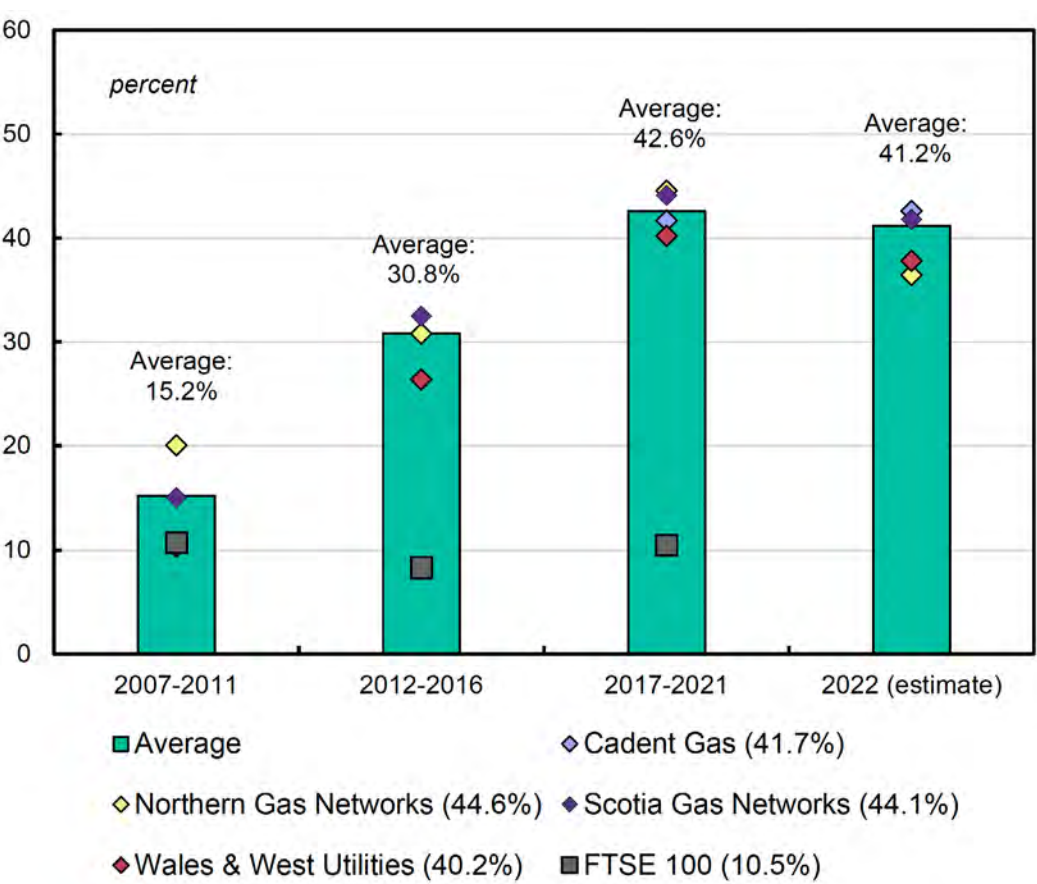


Source: Ofgem (2022)

But how much of households' energy bills actually go to covering the costs of gas and electricity distribution? In 2021, Ofgem reported that the average British customer was set to

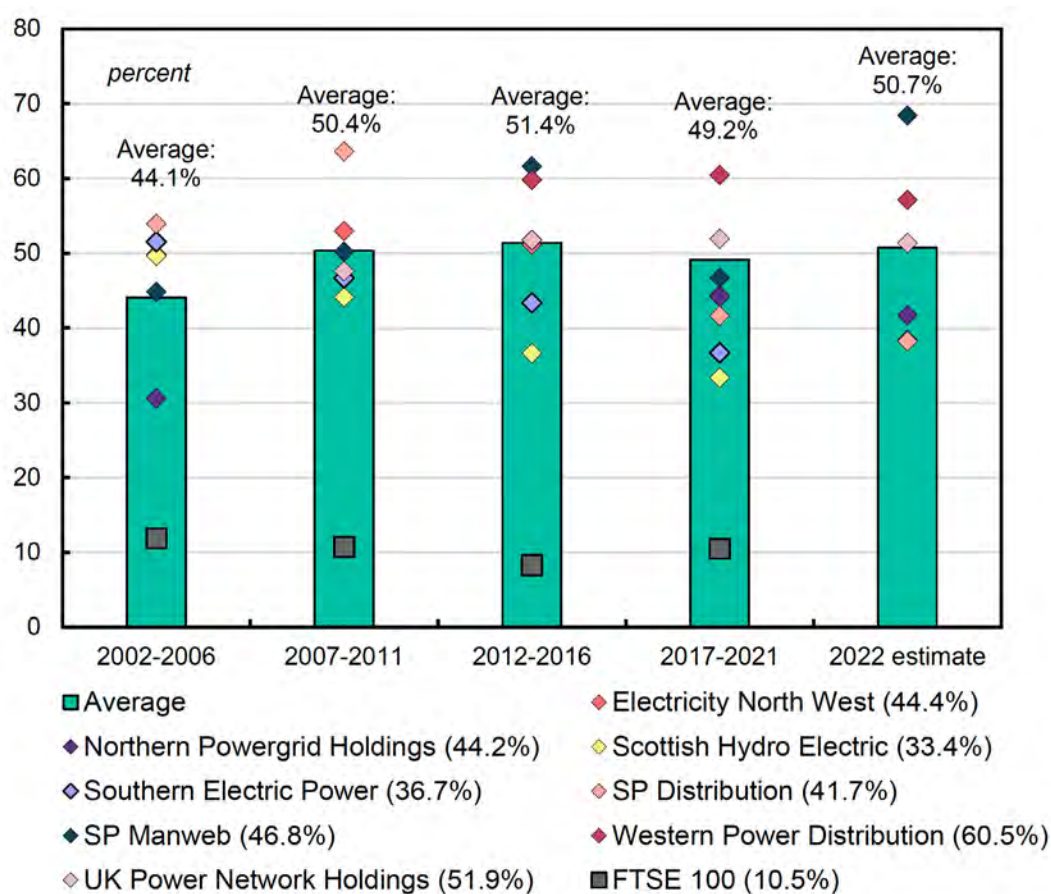
pay £214.35 for gas and electricity distribution, which around the time accounted for roughly one-fifth of a standard energy bill for a typical household (Ofgem 2021a,b). This of course is a significant outlay for most British customers, especially those experiencing fuel poverty. And it is an outlay that would be much smaller if it were not for the huge operating profit margins enjoyed by the major GDNs and DNOs. Figures 2 and 3 show how these profit margins have changed over the past two decades in comparison to the average firm in the FTSE 100, and they also present profit margin estimates offered in October and November 2021 by IbisWorld (2021a; 2021b) for the major GDNs and DNOs this year.

Figure 2. The Gas Distribution Networks' Operating Profit Margin



Source: Bureau van Dijk (2022); IBISWorld (2021a)

Note: Data in legend are firm-level averages for 2017-2021. The last data for FTSE 100 is for fiscal year 2020 as complete data for fiscal year 2021 are not yet available.

Figure 3. The Distribution Network Operators' Operating Profit Margins

Source: Bureau van Dijk (2022); IBISWorld (2021b)

Note: Data in legend are firm-level averages for 2017-2021. Fiscal year-end for Northern Powergrid Holdings, SP Manweb and SP Distribution is 31st December. Fiscal year-end for all other companies is 31st March. The last data for FTSE 100 is for fiscal year 2020 as complete data for fiscal year 2021 are not yet available.

As Figure 2 shows, the major GDNs have enjoyed a dramatic increase in their operating profit margins over the last 15 years: with average profit margins rising from 15.2% in 2007-2011 (when they were just 4.5 percentage points higher than the FTSE 100 average of 10.7% at the time), to 42.6% in 2017-2021 (putting their profit margins no less than 32.1 percentage points higher than the FTSE 100 average of 10.5% around the same period). The same dramatic uptrend in operating profit margins is not in evidence with respect to the DNOs for which we have an even larger range of data. What is instead notable is that these margins have remained extraordinarily high for such a sustained period: with the average among the major DNOs increasing from 44.1% in 2002-2006 to new heights in excess of 50% between 2007 and 2016, and then settling to 49.2% from 2017 to 2021. Astonishingly, what this means is that over the past five years, their average profit margins have been almost five times greater than the FTSE 100 average around the same period. And what is even more astounding is that their average

profit margin is, according to IbisWorld, set to once again surpass the 50% mark this year, with the operating profit margin of one of the major DNOs - SP Manweb - estimated to increase to a dizzying 68.4%.

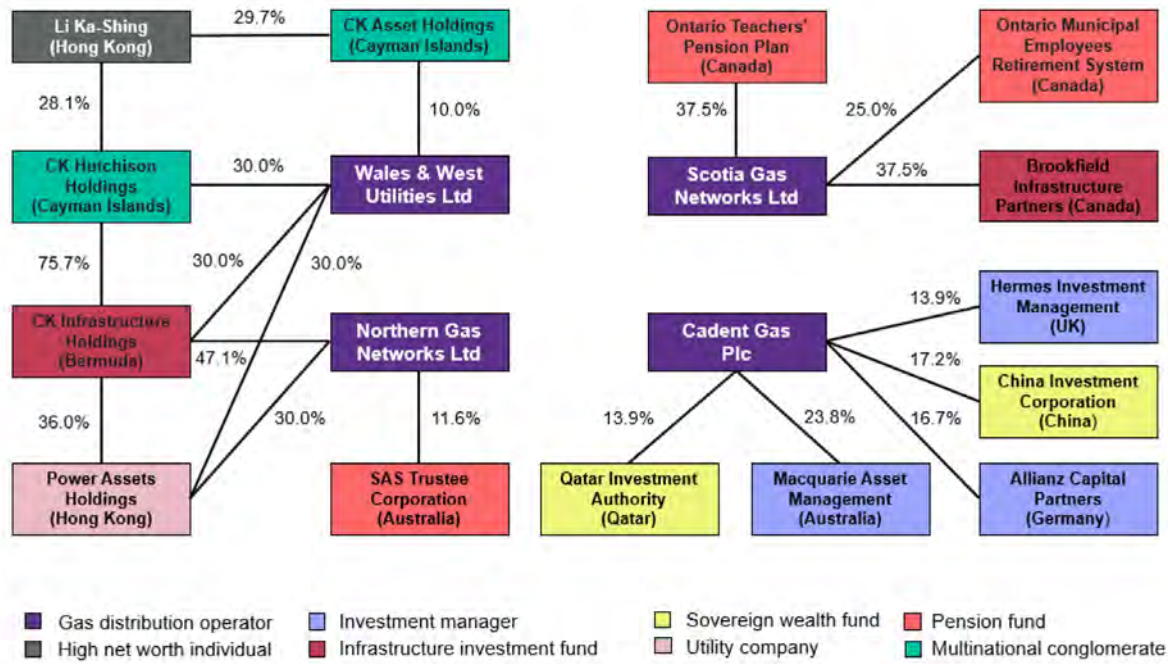
If the goal of Ofgem is to ensure a fair deal for households in conditions of natural monopoly, then it has clearly failed in this mandate. The privatisation of gas and electricity distribution since the late 1980s and early 1990s has resulted in a handful of very large and very powerful firms enjoying stratospheric profit margins, while UK households are subjected to sky-high energy bills.

A Global Network of Ownership

What is the wider significance of the enormous profits made by the distribution operators? For some, the profitability of these companies may not be a huge problem per se so long as the ultimate beneficiaries of these profits, the shareholders, include the general public. We have seen this line of reasoning play out recently in relation to other energy firms. According to [the argument](#), the fact that BP and Shell have recorded soaring profits is no reason to implement a windfall tax because it will harm the pension funds that benefit from the dividends paid out by these companies.

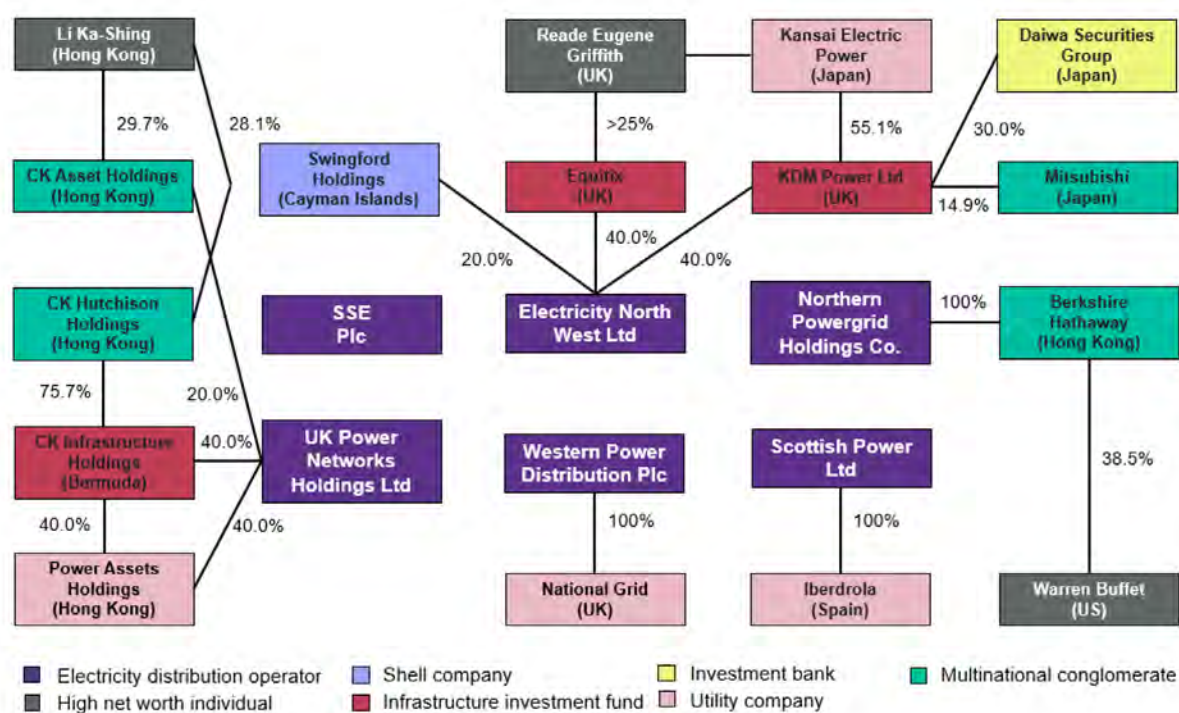
The argument that energy firms should be treated with kid-gloves by policymakers because their profits ultimately find their way in the hands of British pensioners via dividends to pension funds has already been shown in a previous [Common Wealth report](#), in collaboration with the TUC and the High Pay Centre, to be vastly overstated. The proportion of UK-listed shares owned by UK pension funds declined from 32.4% in 1990 to 2.4% in 2018 and those with private pension investments are disproportionately in the highest income bracket; relatedly, UK equities are only an estimated 8% of UK pension fund asset allocation. The findings in Figures 4 and 5 challenge this narrative even further.

Figure 4. Major Owners of the Gas Distribution Networks



Source: Bureau van Dijk (2022); Companies House (2022); SWFI (2021); IBISWorld (2021a); Van Waeyenberge et al. (2021)

Figure 5. Major Owners of the Distribution Network Operators



Source: Bureau van Dijk (2022); Companies House (2022); IBISWorld (2021b)

These figures show all shareholders with at least 10% of equity in the major DNOs and GDNs. Looking first at Figure 4, all four of the major GDNs are privately-held by consortia comprising multinational conglomerates (e.g. CK Hutchison Holdings), sovereign wealth funds (e.g. Qatar Investment Authority and the China Investment Corporation), Canadian and Australian pension funds (e.g. Ontario Teachers' Pension Plan and the SAS Trustee Corporation), and investment managers (e.g. Allianz Capital Partners). Only one financial institution is registered in the UK - Hermes Investment Management – but this is part of Federated Hermes Inc, a US-listed investment manager. The figure of Li Ka-shing, the richest person in Hong Kong and the [43rd richest individual in the world](#), also looms large in the GDNs' ownership network. In fact, via his stakes in Cayman Island and Bermuda-registered holding companies, he is the ultimate owner of 12.3% of Northern Gas Networks Ltd and an astounding 36.4% of Wales & West Utilities Ltd.

In Figure 5 we see a similar ownership network for the DNOs. SSE stands out as a publicly-listed company, unlike all the other major DNOs and GDNs, with no shareholder with at least a 10% stake. The largest stake in SSE is held by the giant asset manager BlackRock which owns 8.1% of overall equity in the company. We see the prominent shareholders of the other DNOs include multinational conglomerates (e.g. Mitsubishi), foreign energy companies (e.g. Iberdrola), and high net worth individuals. These high net with individuals include once again, Li Ka-shing, who through his holding companies is the ultimate owner of 17.9% of UK Power Networks Holdings Ltd as well as Warren Buffet, the [sixth richest individual in the world](#), who ultimately owns 38.5% of Northern Powergrid Holdings via his stake in Berkshire Hathaway.

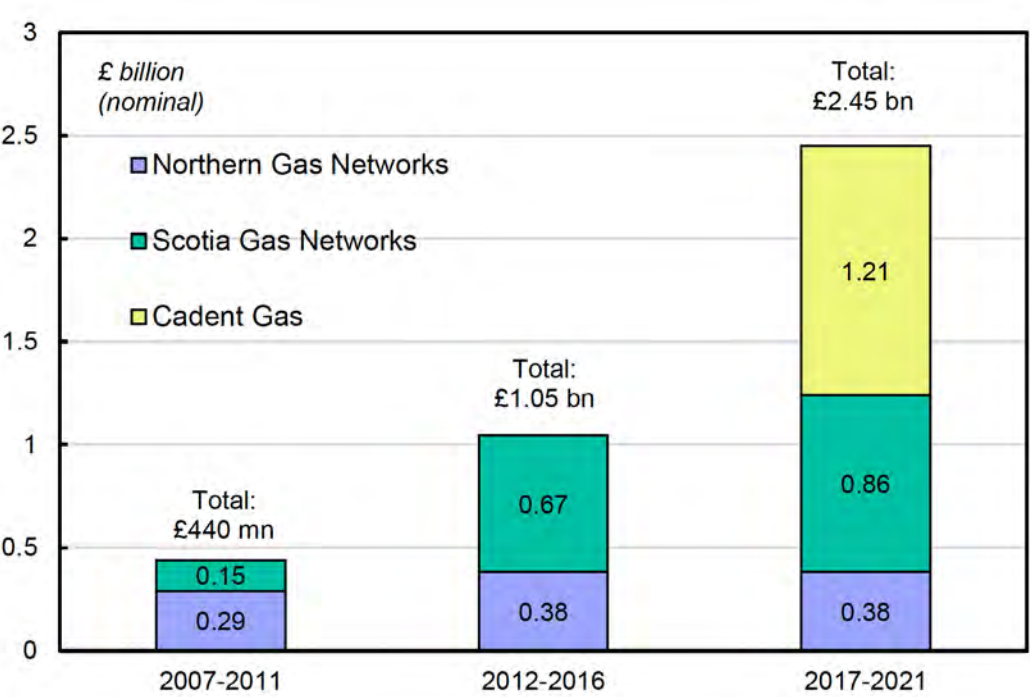
Among the major shareholders in the DNOs’ ownership network, we do not find a single British pension fund.

Extracting Wealth

Rather than serving ordinary pensioners, we can see that the DNOs and GDNs are part of a global network of wealth extraction, in which income generated from UK households’ gas bills is channelled to an assortment of foreign entities and wealthy individuals. But what is the magnitude of that wealth extraction? In other words, just how much of the distribution operators’ superprofits are transferred to shareholders via dividends and other channels?

Figure 6 plots the total amount of dividends paid by the GDNs from 2007 to 2021. Note that Wales and West Utilities Ltd has not paid dividends over this period and therefore does not appear in the figure with the other three companies. As we can see, the dividend payments of the GDNs have rapidly increased from £440 million in 2007-2011 to £2.45 billion in 2017-2021.

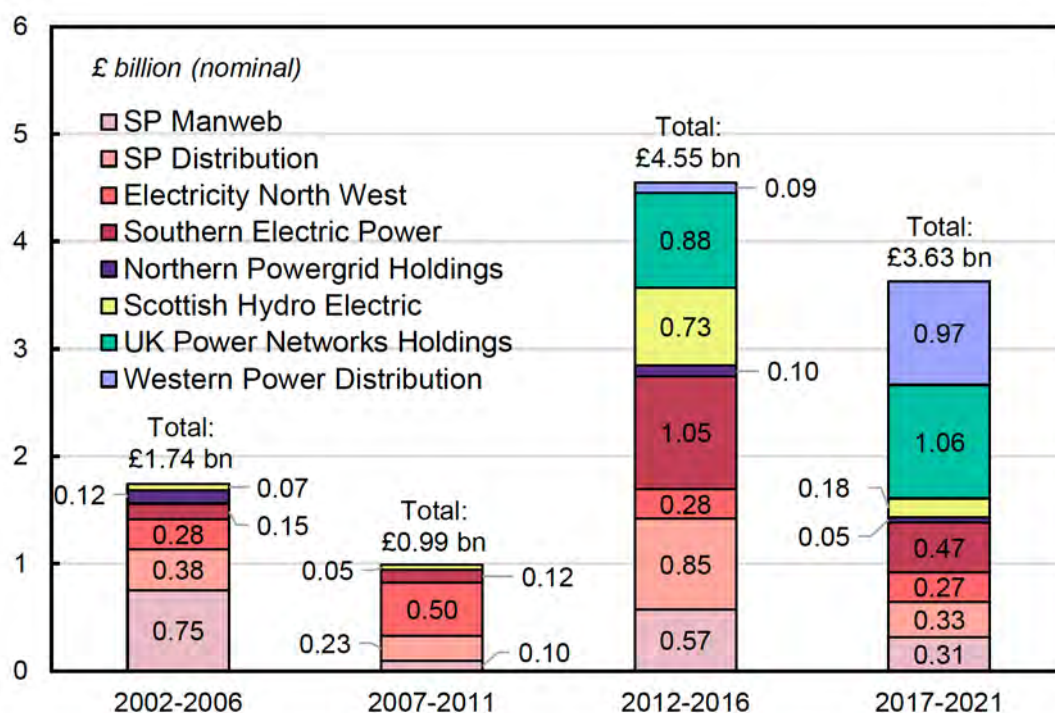
Figure 6. Dividends Paid by the Gas Distribution Networks



Source: Bureau van Dijk (2022); Companies House (2022); IBISWorld (2021b)

Figure 7 shows the dividend payments for the DNOs over the same period. Note that for some companies, namely Scottish Power and SSE, dividends are reported separately by their subsidiaries, which explains why there are eight entities in the figure instead of six. Though they fell slightly in the period from 2012-2016 to 2017-2021, we can see that the DNOs still managed to pay out £3.63 billion in the last five years.

Figure 7. Dividends Paid by the Distribution Networks Operators



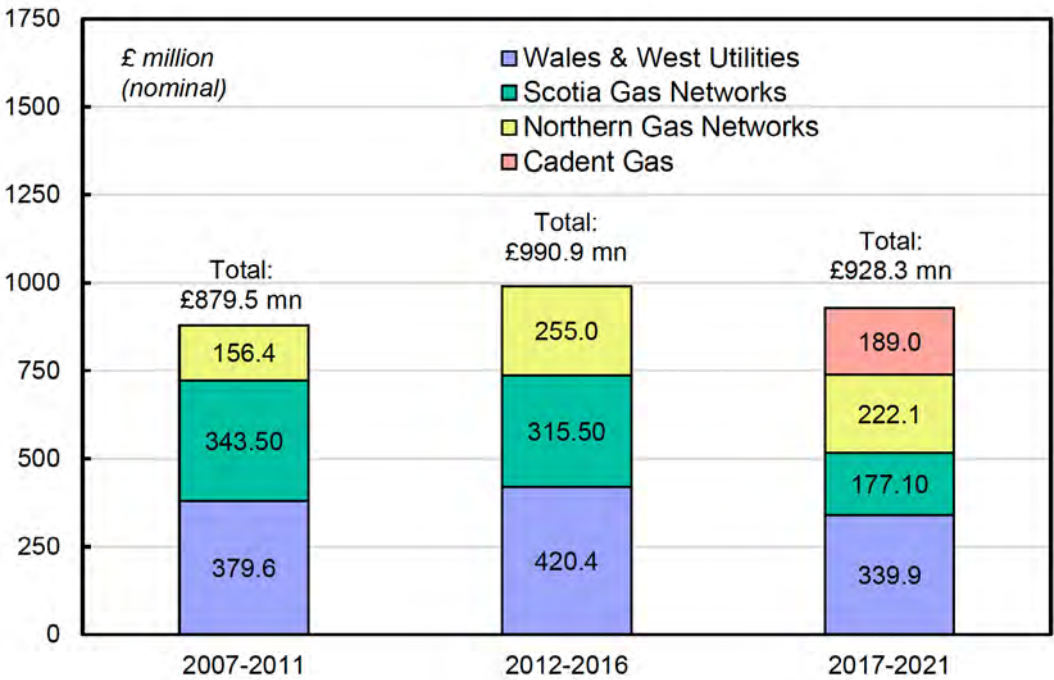
Source: Bureau van Dijk (2022)

Note: Fiscal year-end for Northern Powergrid Holdings, SP Manweb and SP Distribution is 31st December. Fiscal year-end for all other companies is 31st March.

Alongside dividends, the interest payments on intercompany debt owed to shareholders, parent companies and affiliates is [another channel for wealth extraction](#) for private monopolies including the DNOs and the GDNs. Such debt payments are typically paid through offshore holding companies so the interest can go to the ultimate owners tax-free. This backchannel of wealth transfer offers the added advantage of reducing the taxable profits of the major distribution operators in the UK. However, one challenge of tracing such wealth flows is that they are opaque by design. Crucial details can be unearthed in the notes sections of company financial statements, but the reporting of such data is not standardized, and this means that sometimes we do not know when the income payments are going directly to the ultimate owners, indirectly to them via holding companies, or whether they are just being transferred to other entities owned by the same holding companies.

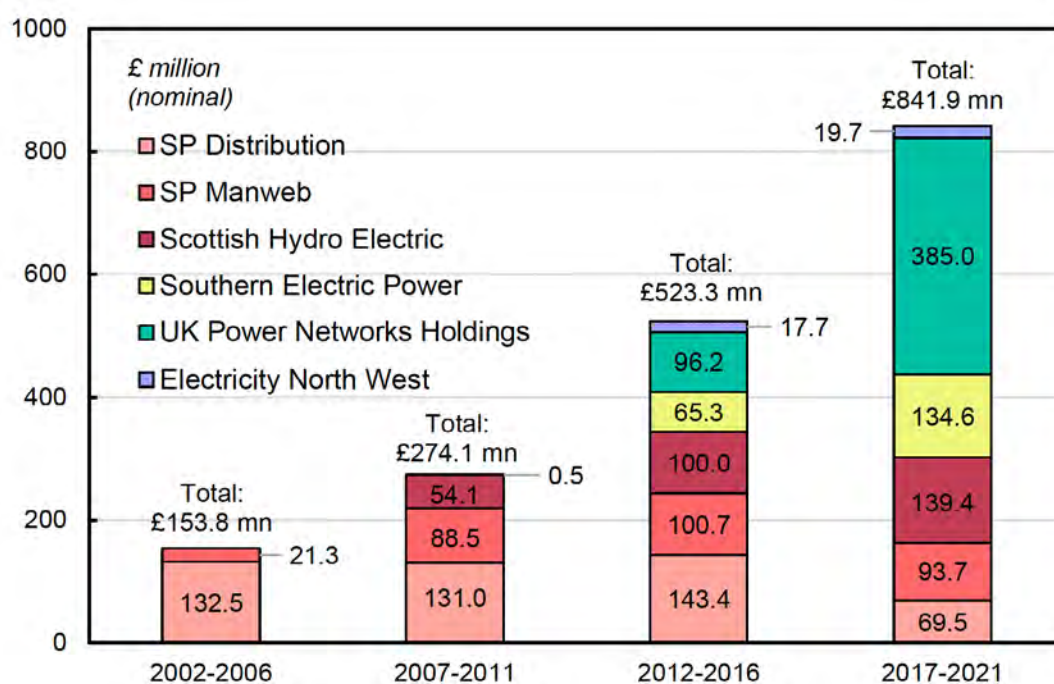
What we do know is that that between 2006 and 2021, Scotia Gas Networks paid £897 million interest on shareholders' loans (and £177 million since 2017); that between 2016 and 2021, UK Power Networks paid £481 million in interest on loans from its shareholders (and £385 million since 2017); and that between 2014 and 2019, £477 million of interest was paid by Wales & West Utilities Ltd to its parent undertaking (and £190 million since 2017). For the other major DNOs and GDNs, the exact direction of internal interest payments is obscured through their use of more vague terms in the notes of their financial statements such as 'intercompany loans' and 'loan notes to affiliates'. Nonetheless, given that such internal interest payments represent an important innovation for both tax minimization and wealth capture, we present all the data on interest payments for internal borrowing for the major GDNs and DNOs in Figures 8 and 9 in the same five-year increments as the previous graphs.

Figure 8. Gas Distribution Networks' Interest on Internal Borrowing



Source: Companies House (2022)

Figure 9. Distribution Network Operators' Interest on Internal Borrowing



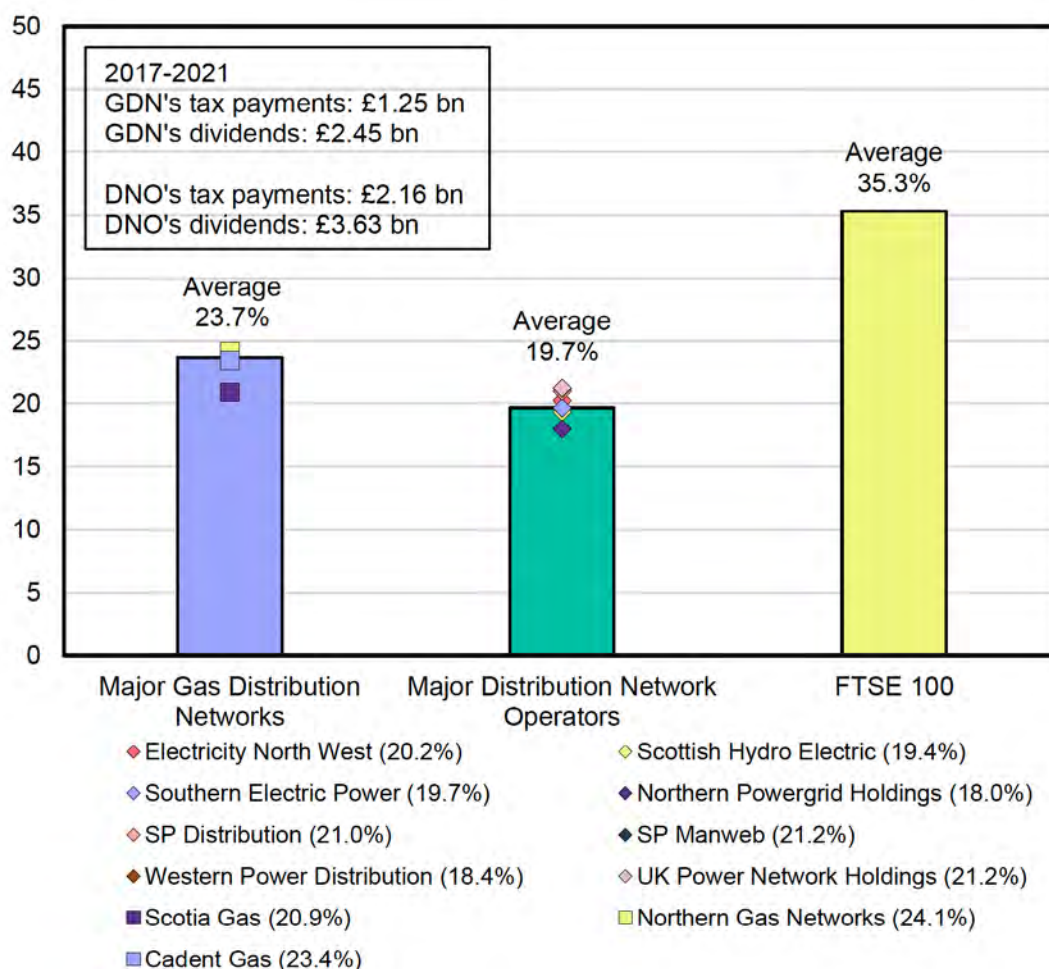
Source: Companies House (2022)

Note: Fiscal year-end for Northern Powergrid Holdings, SP Manweb and SP Distribution is 31st December. Fiscal year-end for all other companies is 31st March.

As Figure 8 shows, interest due to internal borrowing has consistently remained at elevated for the major GDNs, with £928.3 billion in interest due to internal borrowing since 2017. In contrast, as Figure 9 shows, interest payments on internal debt have soared for the major DNOs, reaching £841.9 million between 2017 and 2021 - possibly offsetting the slight decline in dividends in recent years.

Finally, in Figure 10 we compare the effective tax rates (ETRs) of the distribution operators from 2017-2021 to the FTSE 100 average around the same period. We find that the ETRs of both the DNOs and GDNs are significantly lower than for the average company in the FTSE 100. Furthermore, their effective tax rates are well below that of those [major oil and gas companies and energy suppliers](#) which are most often discussed as potential targets for a windfall tax. Intriguingly, Wales & West Utilities does not feature in Figure 10 because it actually ran pretax profit losses of £119.4 million over the period even though it enjoyed operating profits of £904.6 million. The chief factor behind this £1.04 billion gap between huge operating profit gains and significant pretax profit losses is the interest costs of £759 million due to company debt. Remarkably, over 50.8% of this £759 million of interest payable was due to internal borrowing, of which £190 million (25.0% of total interest payable) was due to debt owed to the parent undertaking, £150 million (19.8%) was due to debt owed on loan notes with affiliates, and a further £45.4 million (6.0%) was due to premia payable on company bond buy-backs. These are clear signs of wealth extraction on a vast scale by Li ka-Shing's business empire.

Figure 10. The Gas Distribution Networks' and Distribution Network Operators' Effective Tax Rate Compared to the FTSE 100 Average, 2017-2021



Source: Companies House (2022)

Note: Data in legend are the effective tax rates for the individual companies. Fiscal year-end for Northern Powergrid Holdings, SP Manweb and SP Distribution is 31st December. Fiscal year-end for all other companies is 31st March. FTSE 100 data is for fiscal years 2017 – 2020 only as complete data for fiscal year 2021 are not yet available

In any case, overall what Figure 10 suggests is that the orientation of the distribution operators' business models toward wealth extraction is not being offset by its contributions to the public finances, and that policymakers should consider imposing a tax on superprofits in the energy sector which also encompasses the major DNOs and GDNs. Furthermore, when we look at the raw numbers presented in Figure 10, we find that the major GDNs have paid just £1.25 billion in income taxes from 2017-2021, roughly half the £2.45 billion these companies paid in dividends in the same period. Also from 2017 to 2021, we find that the major DNOs paid £2.16 billion in taxes: about 40% less than the £3.63 billion they paid in dividends during the same years. Thus, even when we put the rather shadowy world of inter-company interest payments to one side, we can see that compared to the dividends-drenched shareholders,

the major distribution network operators do not offer much value either to British households or to the public coffers.

Concluding Remarks: Casting a Spotlight

The purpose of this briefing is to cast a much-needed spotlight on the gas and electricity distribution operators. The hope is that the analysis and findings will stimulate discussion on how the extraordinary profit-making of these widely overlooked firms should be addressed by policymakers in the context of the huge financial strains that low and middle-income households are under due to rising gas and electricity bills. If politicians are concerned about the fiscal consequences of alleviating the cost of living crisis, then a windfall tax on the DNOs and GDNs is sensible, given their outsized profit margins and their below average ETRs. Thus far, most of [the debate about the windfall tax](#) has focused on the oil producers operating in the North Sea, but the findings here suggest that this discussion needs to be widened to other important players in the UK energy system.

More broadly, the findings in this briefing indicate that the UK gas and electricity distribution is broken and should be [taken back into public ownership](#). One of the main advantages of a publicly owned distribution system is that it can put an end to the wealth extraction at the heart of the privatised system overseen by Ofgem. A publicly-owned network of gas and electricity distribution would not be beholden to shareholder pressures for outsized returns, and would therefore be in a much better position to deliver a cleaner, more affordable and more democratic energy system.

Endnotes

Bureau Van Dijk (2022). Fame Database. Accessed: <http://fame.bvdep.com>. 23 February 2022.

Companies House (2022). Company Account Filings. Accessed: <https://find-and-update.company-information.service.gov.uk/>. 23 February 2022.

IBISWorld (2021a). Gas Distribution in the UK - Market Research Report. IBISWorld. 8 November 2021.

IBISWorld (2021b). Electricity Distribution in the UK - Market Research Report. IBISWorld. 12 October 2021.

IBISWorld (2022). Industries with the Highest Profit Margin in the UK in 2022. IBISWorld. Accessed: <https://www.ibisworld.com/united-kingdom/industry-trends/industries-highest-profit-margin/>, 23 February 2022.

Ofgem (2019). State of the Energy Market 2019. Ofgem. 3 October 2019. Accessed: <https://www.ofgem.gov.uk/publications/state-energy-market-2019>. 23 February 2022.

Ofgem (2021a). RIIO-ED1 Annual Report. 2019-20. Accessed: <https://www.ofgem.gov.uk/publications/riio-1-electricity-distribution-annual-report-2019-20>, 23 February 2022.

Ofgem (2021b). RIIO-GD1 Annual Report. 2019-20. Accessed: <https://www.ofgem.gov.uk/publications/riio-gas-distribution-annual-report-2019-20>, 23 February 2022.

Ofgem (2022). Data Portal. Ofgem. Accessed: <https://www.ofgem.gov.uk/energy-data-and-research/data-portal>, 23 February 2022.

SWFI (2021). SSE and ADIA Sell Ownership Stakes in Scotia Gas Networks. SWFI. Accessed: <https://www.swfinstitute.org/news/87706/sse-and-adia-sell-ownership-stakes-in-scotia-gas-networks>, 23 February 2022.

TUC, Common Wealth and the High Pay Centre (2022). Do Dividends Pay our Pensions? Common Wealth Report. 10 January 2022. Accessed: <https://www.common-wealth.co.uk/reports/do-dividends-pay-our-pensions>, 23 February 2022.

Van Waeyenberge, E., Bayliss, K. and Bowles, B. (2021). Shapeshifting in UK Infrastructure Finance and the Limits of Regulation. Rebuilding Macroeconomics Working Paper Series. Working Paper No. 61. https://eprints.soas.ac.uk/35152/1/New-final-RM%20WP%20APRIL%202021%20FINALrevised_.pdf. 23 February 2022.