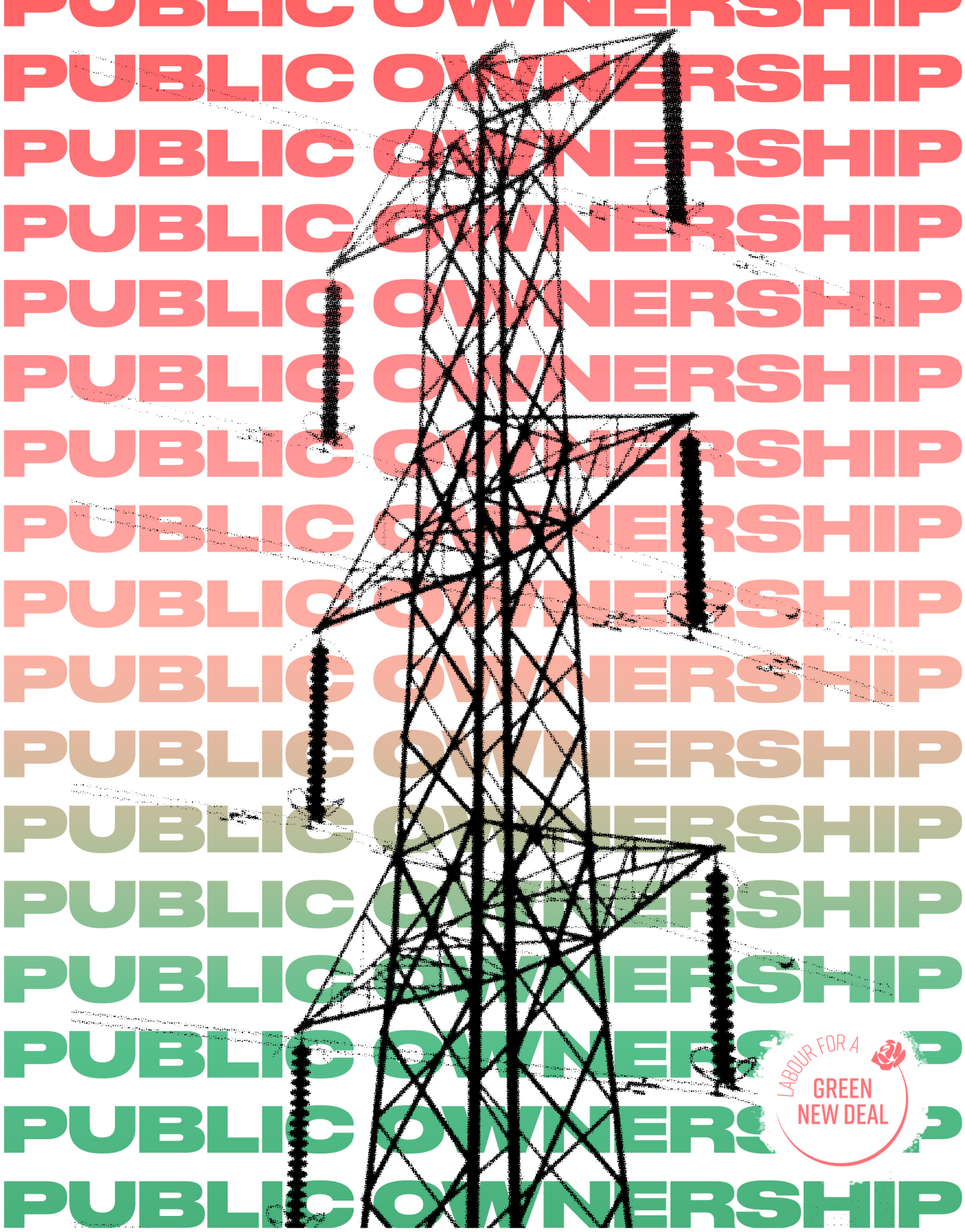

ENERGY: A WHOLE SYSTEM APPROACH

ENERGY: A WHOLE SYSTEM APPROACH

Will Byrd, Alex Stephenson

As the world recklessly hurtles towards 2 degrees warming and beyond, the inability of political leaders to decarbonise energy systems is a failure of almost unparalleled proportions. In 2018, the IPCC released a special report highlighting that to limit warming to 1.5 degrees, a carbon budget of 420 GtCO2 remained. Since then, emissions have continued to climb. With current emissions at roughly 42 GtCO2 per year, we have a carbon budget of 294 GtCO2 remaining. A continued failure to decarbonise will result in this carbon budget being exhausted in just 7 years. It is a fact that more severe emissions reductions will be required the longer political leaders procrastinate. To understand why this is happening, it is important to assess where power and decision making really lie in society. We have seen skyrocketing bills, whilst production costs remain relatively stable, and year on year increases in carbon emissions. The power clearly lies with capital - specifically fossil fuel capitalists.

However, although climate change is an anthropogenic problem, arising from the activity of human beings, we must understand who is responsible for these emissions. At the global level, the richest 1% of people are responsible for more than twice the volume of carbon emissions than the poorest half of humanity. Furthermore, the majority of historic emissions, including through colonial and neo-colonial exploitation, have come from the Global North. It is clear that the UK has a responsibility to decarbonise as quickly as possible. During this transition, Global South resource sovereignty must be respected to prevent the reproduction of neo-colonial exploitative relationships that characterise the capitalist fossil fuel economy. Therefore, decarbonisation in the UK must be planned, occurring in concert with intense energy efficiency and energy reduction programmes - i.e., large-scale retrofitting and greatly expanded public transport - to reduce the need for resources for renewable energy technologies. To understand the catastrophic potential of an unplanned energy transition under capitalism, we need look no further than recent events relating to national and global energy markets.

Understanding where our energy comes from, and who makes decisions about this, has never been more important. The cost of living crisis has highlighted the key role that the energy system plays in our economy, and the impact its volatility can have on society. This has exposed a deeply dysfunctional system, where we see energy system actors benefitting from the crisis at the expense of the general public. In May 2022, during the initial stages of drafting this report, we saw BP report their highest quarterly profits for a decade, whilst Shell revealed that their first quarter profits had nearly tripled since last year. As the year has progressed, the situation has become even more extreme. As of August, Shell have reported record profits of nearly £10 billion between April and June, with £6.5 billion of this being transferred to shareholders. BP are not far behind, tripling their profits to nearly £7 billion in the second quarter of the year, with £3.8 billion of this being transferred to shareholders.

Labour for a Green New Deal see this, not just as a failing of particular actors, but as a natural consequence of leaving energy security to the vagaries of the market. Yet, as this report will

demonstrate, the impact of market forces on the public is only part of the story. From subsidising fossil fuel extraction, to setting the prices of energy extraction, transmission, and supply, the state guarantees a level of profit for the private sector. Losses are socialised and profits are privatised, leaving the working class to pick up the bill. This is clearly a systemic problem, rooted in the capitalist logic of perpetual accumulation and expansion. Only radical socialist solutions will be sufficient.

In August 2022, Institute for Government estimated that if the new government wanted to offset almost 90% of bill increases this financial year and next year, the cost of this bailout would be just over £90 billion, representing a direct transfer of wealth to energy suppliers. However, this was assuming the average annualised bills for a typical household would reach £4,300 from January 2023. They are now projected to rise to over £7,700 from April 2023, making the £90 billion a vast underestimate. It is clear that the costs associated with a privatised energy system are vast, which has been most clearly highlighted by Treasury estimates that UK gas producers and electricity generators may make excess profits totalling as much as £170 billion over the next two years. The public recognise the nature of this rigged system, with recent polling showing that 66%, including 62% of Conservative 2019 voters, think that energy should be run in the public sector. It has become increasingly clear that the resistance to nationalisation from the political class is based in ideology, rather than supposed pragmatism.

This report assesses the viability and benefits of different socialist models of ownership of the energy system. Whereas previous policy papers tend to consider the sections of the energy system in isolation - i.e., looking at extraction, transmission, or supply - this paper takes a comprehensive view of the entire energy system. This allows for a whole system analysis, uncovering where value is being extracted and where environmental damage becomes baked in, and explaining why interventions in later stages of the system in isolation won't be sufficient.

The paper will consider energy extraction, transmission and distribution, and supply and assess it, broadly speaking, against the following 3 criteria:

- **Economic**: How does the current ownership and funding model impact the economy and inequality, and would public ownership ensure that these impacts are positive?
- **Environmental**: Does this industry or business have a key role in decarbonisation and the meeting of Paris Agreement obligations, are there any negative influencing factors, and would public ownership ensure that these influencing factors are positive?
- **Social**: Does this industry or business have a key role in guaranteeing provision of energy as a basic right, are there any factors that prevent this, and would public ownership ensure that this occurs?

Based on the current crisis being rooted in unequal class power, the proposed interventions aim to rebalance this power across the whole system, significantly reducing the possibility that interventions in one part of the system will just displace exploitation to another. This paper concludes that without transformation of ownership of the energy system following socialist principles, the status quo will not deliver climate justice or a safe future.

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This paper conceptualises the energy system as:

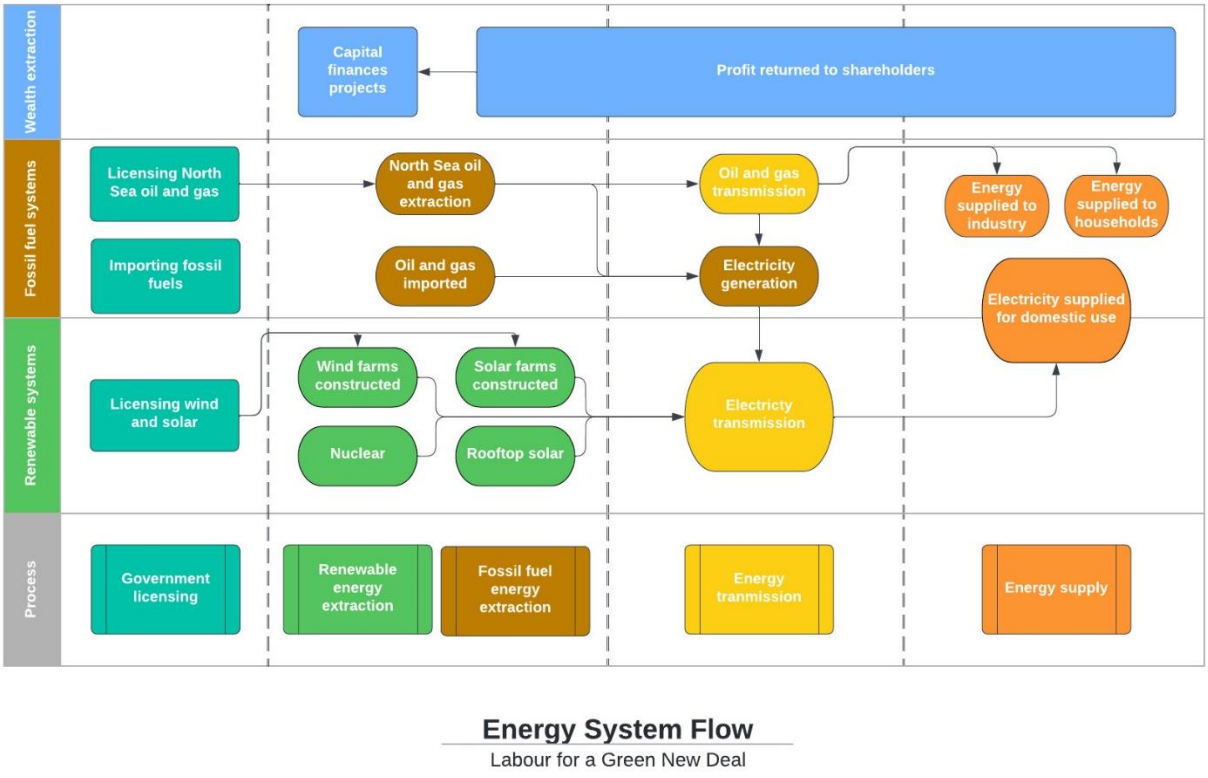

Figure 1: A simplified representation of the UK energy system, highlighting key elements of extraction, transmission, and supply

Introduction

Why public ownership?

This paper takes the view that the Labour Party - a democratic socialist party - has an obligation to ensure that the UK energy system prioritises equity, worker and citizen control, direct democracy, international resource sovereignty, and environmental and ecological health. All options must be considered when assessing how to meet these obligations. As is demonstrated throughout the paper, guaranteeing public ownership of the energy system prioritises these obligations, whilst simultaneously:

1. Ensuring rapid decarbonisation and electrification of the energy system at the scale required by the climate crisis
2. Maximising energy grid stability, source diversification, and security at both the household and the system level
3. Ensuring universal access to energy, minimising average household energy costs, and eliminating regional inequalities
4. Maximising long-term decent employment creation and retraining
5. Empowering citizens and communities to participate in the energy transition

How public ownership?

As Christine Berry and Joe Guinan highlight in *People Get Ready!*, post-war nationalisation often created highly centralised public corporations, concentrating economic and political power in London, which were served by technocratic boards that made decisions insulated from popular democratic control. This paper puts forward a proposal that would challenge this orthodoxy, instead proposing a publicly owned energy system that operates on the principles of accountability, transparency, and democracy, and avoids the remote, unresponsive, and unaccountable bureaucracies associated with post-war nationalisation.

Instead, the guiding principle for public ownership must be that decisions are made as close as possible to those that are impacted. This decentralisation would ensure that these new models of public ownership enable maximum worker and citizen democratic control, building local working class power. Where this is not appropriate - i.e., setting national standards, distributing costs, or operating industries and assets that are concentrated in one place - decisions would be made through a democratically accountable national service.

The proposed nested structure reflects the institutional infrastructure described in the Labour Party report *Bringing Energy Home*. A publicly owned energy system would consist of a National Energy Agency (NEA), 14 Regional Energy Agencies (REAs) established using the regional electricity Distribution Network Operators, Municipal Energy Agencies (MEAs) which map onto local authority levels of government, and Local Energy Communities (LECs) (see *Figure 2*). This system combines decentralisation and local participation with central authorities that guarantee high standards, a fair allocation of costs, and regional and national planning. These central

authorities are particularly important for ensuring that decentralisation doesn't reinforce regional inequalities. In their absence, there is a risk of creating energy islands, where communities with the financial and physical resources to decarbonise leave behind those who cannot. In this sense, guaranteeing that costs are allocated fairly ensures that the energy transition is just, coordinated, and eliminates existing regional inequalities. The Appendix describes how this publicly owned energy system would be established and lays out the functions and responsibilities of the independent public authorities (NEA, REAs, MEAs, and LECs).

The operational management of these new public authorities would be in the hands of both management and the workforce. Governance of these institutions would provide democratic oversight and accountability, enable maximal public and worker participation, and deliver environmental, technical, and economic effectiveness and efficiency. To ensure this, the boards of these public authorities would include members appointed by elected representatives, elected by workers, and elected by citizens, where at least 50% of members are women. All meetings would be public, live, and online, accompanying complete transparency of documentation. Democratic governance would be furthered by engaging the public over strategic direction and planning through online processes and regular meetings.

National Energy Agency:

- Set up on the National Grid and Ofgem
- **Responsible for:**

1. Setting decarbonisation targets
2. Owning, investing in, and operating transmission networks
3. Strategic decision making
4. Distributing costs
5. Setting standards
6. Regulating the energy system
7. Overseeing the operation of nationalised energy companies with assets concentrated in one place (e.g., fossil fuel extraction, offshore wind farms, legacy nuclear reactors)
8. Coordinating skills and workforce planning with trade unions

Regional Energy Agency:

- Set up on the 14 regional electricity Distribution Network Operators
- **Responsible for:**

1. Owning, investing in, and operating distribution networks
2. Decarbonising heat and electricity through investing in renewable energy capacity
3. Supplying energy directly to households
4. Shaping regional industrial strategies by using procurement and planning powers
5. Developing skills Institutions and coordinating just transition pathways with the NEA and trade unions

Municipal Energy Agency:

- Will map onto local authority levels of government, from Parish to City
- Local authorities will have to demonstrate competencies to be established
- **Responsible for:**

1. Will have to request responsibilities to be devolved from their respective REA (including 1-5)

- A network of MEAs will be established to promote peer-to-peer skill-sharing and collaboration

Local Energy Community:

- Communities at the level of a street, housing estate, or small village, will be able to establish cooperatives or community benefit societies
- Communities will have to demonstrate competencies to be established

Responsible for:

1. Generation, distribution, and supply of energy at the micro level

- A network of LECs will be established to promote peer-to-peer skill-sharing and collaboration

Figure 2: The proposed institutional structure of a publicly owned energy system

Energy extraction

Fossil fuels

As of January 2015, the North Sea was the most active offshore drilling region in the world, with 173 active drilling rigs. The scale of the oil and gas industry is one that rarely features in discussions of the UK economy or energy sector, yet in 2020, despite the drop in oil prices during the pandemic, the North Sea oil and gas fields were still producing 1.61 million barrels a day. This scale of production, combined with the record rise in the prices of oil and gas, has enabled global energy companies like BP and Shell to make huge profits at the expense of the general public. In 2021, the International Energy Agency announced that to reach net zero by 2050, no new investments in oil, gas, and coal must occur. However, the UK has 5.7 billion barrels of oil and gas in already operating oil and gas fields, enough to exceed Paris Agreement obligations. Much of this needs to be kept in the ground, clearly challenging the profit maximising logic of capitalism.

Privatised oil and gas companies are the single biggest barrier to rapid decarbonisation. This paper discusses two strategies for overcoming this. Firstly, public ownership of the privatised oil and gas companies is proposed, providing the state with the most effective means of deep decarbonisation of the energy system, by directly preventing the extraction of UK fossil fuel reserves that are at odds with climate science. Additionally, this would enable oil and gas to be provided nearer to the cost of production, substantially tackling the cost of living crisis. Finally, public ownership would ensure that communities and workers are supported by the state through the energy transition.

Whilst *Labour for a Green New Deal* consider full public ownership to be the preferred solution, the urgency of the climate crisis and inevitable capitalist hostility to a Labour government, coupled with the long-term redundancy of these privatised oil and gas companies, necessitates the consideration of a second approach. This would be based upon aggressive taxation, regulation, and the public ownership of strategically important assets, to phase out the existence of the fossil fuel industry.

In both cases, the massive influence that privatised fossil fuel companies exert on the public consciousness must be considered. For decades, a complex climate denial propaganda network, funded by fossil fuel capitalists, intentionally obscured the link between burning fossil fuels and the global climate crisis. As the impacts of the climate crisis have become more immediate in the Global North, marketing has become more subtle and has pivoted towards claims that these same fossil fuel companies are driving the energy transition. Just two days after the Labour Party proposed a windfall tax on North Sea oil and gas profits, BP started running greenwashing propaganda that championed their investments in green energy, adding to more than £800,000 that they have spent on social media advertising in the UK in 2022 alone. However, analysis shows that these claims do not align with business plans, which rely on increased exploration and extraction.

Through public ownership, this marketing would be prevented, opening the space for public information campaigns to educate the public on the realities of the climate crisis and the possibilities of a just transition. In the absence of full public ownership, there must be strict regulation that prevents these privatised fossil fuel companies from lobbying governments, spreading greenwashed propaganda, and enjoying partnerships with public institutions.

Related to this complex climate denial propaganda network, it is important to counter the arguments made by the fossil fuel industry that we can continue to burn fossil fuels and rely on carbon capture and storage (CCS). This depends on technologies becoming available that currently do not exist. At best CCS is unproven, with trials often unmitigated failures. In July 2021, it was reported that the biggest CCS project in the world had failed to meet a five-year target, with it likely to have only captured 30% of what it was supposed to. It is clear that the fossil fuel industry is using this technology as a means to extend the life of fossil fuel infrastructure far beyond what is possible under Paris Agreement obligations. Given existing industry and technology, the UK is able to decarbonise the vast majority of its energy supply. If the UK focuses on rapidly decarbonising its energy system and at some point in the future CCS becomes viable, then this opens up space for countries in the Global South, who are least responsible for historic cumulative emissions, to make use of this technology.

The arguments for the public ownership of fossil fuel companies

There are multiple economic arguments for taking fossil fuel companies into public ownership. It is important to consider the impact of exposure to volatile global markets. The UK energy crisis has not been brought about by an increase in the cost of producing energy, but by how much energy sells for on international markets. Privatised companies are compelled by their shareholders to maximise profits, and because of this, oil and gas are sold at the highest possible price. In contrast, fossil fuel companies run in the public interest would be able to provide oil and gas nearer to the cost of production, insulating citizens from price shocks.

Understanding how these profits are used is essential to assess whether these privatised companies are taking the threat of climate disaster seriously. Currently, profits are either returned to shareholders as dividends or invested in further exploration and extraction of oil and gas - BP only invests up to 2.3% of annual capital expenditure on clean energy. Furthermore, since 2010, BP and Shell have spent £147.2 billion on stock buybacks and dividends, with shareholder pay-outs that cover 98.3% of pre-tax income for BP. An industry run for public benefit would instead use surpluses to reduce energy prices and invest in the energy transition, ensuring a more equitable distribution of wealth.

In addition to arguments structured around wealth extraction, it is worth examining why decarbonisation under market conditions will produce a ‘too little too late’ response. Tackling climate change requires a coordinated global response involving a huge range of actors - multinational corporations, various levels of government, and citizens. It is highly uncertain whether this coordinated action will materialise, resulting in the market being unable to direct sufficient resources towards renewable technology at the scale and pace required. Currently, the

biggest fossil fuel companies are betting against this coordinated action, with a dozen on track to commit $84 million a day on oil and gas projects that cannot come to fruition if global heating is to be limited to even 2.7 degrees. The extent of financial exposure to stranded fossil fuel assets is creating an incentive to rely on carbon capture and storage, an unproven technology that diverts investments from renewables whilst encouraging further fossil fuel exploration and extraction. Environmentally, these conditions of high economic uncertainty, created by distorted market pricing mechanisms, have further accelerated climate change. As we pass 'tipping points', the impacts of climate change become baked in and the rate of crisis accelerates. Privatised fossil fuel companies won't voluntarily decarbonise because it's the right thing to do. It's clear that leaving the energy transition up to the market is guaranteeing climate breakdown.

Continued state inaction will lead to a huge range of economic consequences. One worth considering is the systemic risk posed by stranded assets. The assets of fossil fuel companies are mainly comprised of proven fossil fuel reserves. To retain market value, fossil fuel companies must continue turning these assets into products, whilst expanding their reserves to increase production and accumulate capital. In a capitalist economy, failure to grow in this way threatens their survival. However, limiting global warming to 1.5 degrees will require leaving the vast majority of known oil, gas, and coal reserves in the ground. Moreover, nearly half of existing fossil fuel production sites will need to be shut down early to meet this target. Conservative global estimates of potential stranded fossil fuel assets amount to at least $1 trillion. A sudden, disruptive energy transition - a likely best case scenario if we leave it up to market forces - would quickly render these assets worthless, with likely repercussions across the economy as pensions, savings, and investments drop in value. Whilst it is necessary for these assets to become stranded, the extent to which this impacts the general public and risks financial contagion can and must be aggressively controlled. Public ownership would mitigate these risks by ensuring that a transition occurs in a coordinated and managed way.

Unplanned decarbonisation under market conditions would cause further disruption to society through the unmanaged decline of the fossil fuel sector. Many communities are highly dependent on the 260,000 UK jobs in the fossil fuel industry, and to ensure that they are supported through the energy transition in a just and resilient way, coordination is required to diversify their economies and build community wealth. Public ownership is essential for all workers from the fossil fuel industry to receive good, well paid, green unionised jobs on equal terms and conditions. Leaving this to the market will likely result in huge layoffs, devastated communities, and degraded environments.

The arguments for the taxation and regulation of fossil fuel companies

The size of privatised fossil fuel companies and the scale of transformation required in the UK energy sector requires specific considerations of the potential barriers to nationalisation. A socialist Labour government would find itself faced with the hostile interests of the capitalist class, against which political efforts must be tactically and precisely exercised. Such a large nationalisation programme would inevitably be fiercely resisted by vested interests, and so any proposed intervention must be weighed against alternative proposals.

The immediate social, economic, and environmental challenges we face are huge, from decarbonising housing, transport, and industry, to retrofitting homes and eliminating poverty, and so the demands on a socialist Labour government in its first term would be extensive. Similarly, the demands on state capacity - hollowed out by decades of neoliberal assault - would be considerable, and although a key focus of a socialist Labour government would be on rebuilding and strengthening this capacity, initially it must be utilised wisely. Irrespective of ownership, the state can force decarbonisation through regulatory and fiscal measures. For this reason, one of the major benefits of full nationalisation is not necessarily the transfer of new political powers, but the ability to guarantee change is achieved through it being performed by the state, protecting communities and workers in the process. This potential certainty needs to be weighed against the political capital required for the state to assume ownership. Therefore, an alternative approach to full public ownership is a programme based upon aggressive taxation, regulation, and the public ownership of strategically important assets, to phase out the existence of the fossil fuel industry.

The UK continues to provide extensive and generous subsidy to the fossil fuel industry, in both the form of direct subsidy - such as the recent tax breaks for fossil fuel companies investing in domestic production and the continued freezing of consumptive fossil fuel taxes - and indirect subsidy - such as the decision not to hold fossil fuel companies accountable for the negative economic, health, and social impacts of their products (e.g., Public Health England estimates that between 28 and 37 thousand deaths a year are caused by air pollution, whilst DEFRA reports that the economic impact of air pollution is estimated at £9-19 billion a year). A progressive taxation programme would recognise the inherent unfairness in these costs being borne by the public, basing itself on a polluter pays principle. The true cost of carbon would accelerate decarbonisation in the UK as fossil fuels become increasingly unviable when compared to government-owned renewable energy sources. Furthermore, the government must implement a permanent windfall tax scheme, which would see excessive profits in the sector curbed. This should be at least 56%, bringing the effective tax rate on privatised oil and gas company profits to 75%. Whilst this would help to radically rebalance power in the UK economy, it would simply bring our tax system in line with social democratic states such as Norway. To ensure that the new tax system is progressive, the revenues should be ring-fenced, enabling wealth to be redistributed to working class households, substantially tackling the cost of living crisis, and invested into publicly owned renewable infrastructure. Additionally, revenues must support communities and workers through the energy transition in a just and resilient way, ensuring that privatised fossil fuel companies pay for this process.

Alongside an aggressive taxation programme, a Labour government would need to implement targeted and comprehensive regulation that ensures the energy sector is decarbonised by 2030. Currently, private companies are permitted to extract resources based on government granted licences. Much of the known oil and gas reserves will need to be kept in the ground if we are to stay well within 1.5 degrees of warming, requiring the government to rescind some of the licences of privatised oil and gas companies. This regulatory approach would mandate these companies to reduce and halt production much sooner than would happen if left to market forces, a step that is absolutely necessary if we are to limit the most severe consequences of climate change. This

would provoke potential conflicts that the government would need to pre-empt, including threats of offshoring operations. Therefore, it is essential that a just transition framework for good, well paid, green unionised green jobs is produced in advance, ensuring that the cost of the energy transition is not borne by workers and their communities, but by the privatised fossil fuel companies themselves.

Recognising the responsibility the state has to meet the energy demands of the future necessitates public ownership of strategically important assets. As it currently stands, investments in green technologies, such as hydrogen energy and carbon capture and storage, are often undertaken in their early, unprofitable stages using public money - e.g., UK Government grants - in public academic institutions. However, these technologies are then sold to the private sector at severely depressed prices, enabling them to be produced and sold for massive profits. Often, these are bought by privatised fossil fuel companies who use them to greenwash their reputation. Ensuring that decarbonisation happens on an equitable and global scale means that these novel and potentially crucial technologies cannot be left to the market to distribute. Instead, the government should pursue a targeted programme of public ownership, whereby assets owned by privatised fossil fuel companies which are deemed crucial to decarbonisation are transferred to public ownership, enabling these technologies to be shared freely internationally. Additionally, there will be a need for the publicly owned energy system to draw on non-renewables whilst renewable energy capacities are being built up. In response to this, public ownership of strategically selected non-renewable generators based on regional needs would be necessary.

Finally, with the UK Government's commitment to ban the sale of internal combustion engines (ICEs) by 2035, we need to give serious thought as to how we will build and distribute a charging network for electric vehicles. Over time, the national network of fuel stations will need to transition to electric vehicle charging. The targeted public ownership of these facilities is an idea that is likely to meet limited resistance from the oil and gas industry, because as ICEs are phased out, the majority of vehicle refuelling - recharging - will happen at home, as opposed to in transit, making these fuel stations much less valuable.

Renewable energy

In 2019, energy supply accounted for 21% of UK emissions. In order to decarbonise the energy sector, the UK government will have to massively expand the provision of zero carbon energy generation, particularly utilising offshore wind farms and large solar farms. However, there are barriers to private sector rollout at the pace necessitated by the climate crisis. In contrast to oil and gas reserves, it is difficult to enclose the wind and the sun, meaning that renewable investments are often less profitable than fossil fuels. Generally, private companies are compelled by the pressures of capitalist competition to seek investments where the expected profitability is highest. This results in the doubling down of investments in oil and gas, with BP and Shell using their record profits to invest three times and ten times more in fossil fuel production than renewables in the first half of 2022, respectively.

Currently, to incentivise and de-risk private investment, offshore wind farms are financed through agreements known as contract for differences (CfD). A CfD guarantees that the state will buy energy at a fixed price from renewable energy developers, ensuring that they receive a certain level of profit, ostensibly incentivising investment. Onshore wind farms receive renewables obligation contracts, where they are paid the wholesale price plus a subsidy. Under these agreements, to overcome the structural barrier of low profitability, the state guarantees returns for investors by paying above market rates, especially when energy prices fall. Instead, the state should use its capacity to develop renewable energy capacity at scale, faster than the private sector, and financed through cheaper government debt. Additionally, dividend payments to shareholders would be eliminated, enabling surpluses to be returned to citizens through reduced energy prices and invested in publicly owned renewable energy capacity, driving the energy transition.

Currently, 44.2% of existing and 38% of pending UK offshore wind generation capacity is publicly owned by foreign states. In contrast, just 0.03% is owned by UK public entities. The rest is mainly controlled by private equity funds and multinationals. This privatisation of the riches of the wind and the sun means that wealth is being extracted from the UK commons. A similar situation occurred with the privatisation of oil and gas in the North Sea, where natural resources were used to enrich private actors, rather than for building shared social wealth. Over the next two years alone, the UK is missing out on up to £122 billion of direct income because of the privatisation of power plants. Full public ownership is required so that enclosure and looting of the commons cannot happen again.

To ensure that the energy sector is decarbonised by 2030, there is a need for a publicly-owned power generation company. However, it is not enough for this to be established in recognition of a failing energy market, only to compete with the private sector, especially when there are known structural barriers that will impede a rapid transition. The UK economy is characterised by systemic slowdown, with profitability stagnant and historically weak. In this context, arguments are made for state intervention to mobilise private investment, but public money should not be used to rescue a failing energy market. Instead, a publicly-owned power generation company should drive a democratically planned transition, supplanting the private energy market and responding to the needs of citizens, whilst liberating society from the desires of shareholders. If the UK already had a public energy champion, a significant portion of the excess profits taken by privatised electricity generators due to soaring wholesale prices would instead be coming to the government, equivalent to up to £4,400 per household. These revenues could be invested in publicly owned renewable energy capacity and returned to citizens through reduced energy prices.

The democratic planning that a public energy champion enables is needed to ensure that the deployment of renewable energy capacity builds community wealth whilst eliminating regional inequalities. Large wind farms and solar farms will not be evenly distributed throughout the UK, meaning that a nationally owned company is required to fairly distribute the wealth created by this infrastructure. The surpluses produced by this infrastructure could be used to drive investment by REAs and MEAs in locally owned renewable energy capacity. Additionally, this could accelerate

the development of new publicly owned technologies where the private sector is unwilling to take the risk. Under public ownership, these technologies would be able to be shared freely internationally. Where possible, the onshoring of supply chains could occur to stimulate local economies, and where global supply chains are required, ethical standards must be bolstered in concert with respecting Global South resource sovereignty. This huge investment in the renewable energy industry would bring energy security to the UK, creating an opportunity for real industrial strategy, whilst diversifying economies, creating good, well paid, green unionised jobs, and building community wealth in deindustrialised regions.

Energy transmission and distribution

Once energy has been extracted in the form of gas and electricity, it is transported over long distances at high pressure or voltage across the UK by transmission networks. Distribution networks are then involved in the more localised transport of this gas and electricity to and from end users. These networks were originally developed and owned by public authorities. However, they were privatised under the Thatcher government, with the gas network sold off in 1986 and the electricity network soon after in 1990. This has created a network of national and regional monopolies, where there is no possibility of competition. These monopoly positions have been abused by these privatised companies, creating the most profitable sectors in the UK, where profit margins for gas and electricity distribution are 40.5% and 42.5%, respectively. These costs are largely hidden from the public, with energy supply companies taking most of the blame. However, as of 2019, network costs represented over a quarter of gas and electricity bills. It is important to highlight this extreme profiteering as one of the underlying structural causes of the energy crisis.

These companies operate in an extremely advantageous regulatory climate, developed to ensure that these privatised network companies do not fail. This regulatory role is undertaken by Ofgem, ostensibly an independent regulator. Ofgem have failed to adequately manage the profit-seeking nature of these privatised network companies, leading to abuses of monopoly power. These abuses are passed onto citizens as increases in their energy bills. This failure highlights the massive power imbalance between these monopolies and citizens, where the regulatory functions have been captured to serve the interests of the privatised network companies. Publicly owned transmission and distribution networks would save the public the costs of this regulatory oversight, eliminating the incentive to game the system to generate high profit margins.

It is important to highlight just how much these privatised network companies are gaming the system to dispel any myths surrounding the supposed efficiency of private ownership. Moreover, a political ring fence exists which often excludes the financial side of businesses from the political spotlight. This must be broken down for us to understand how global finance, and the risks it brings, have become embedded in the everyday lives of citizens. The Gas Distribution Networks (GDNs) and electricity Distribution Network Operators (DNOs), owned by multinational conglomerates, sovereign wealth funds, high net worth individuals, and investment managers, are part of a global network of wealth extraction. Other than enjoying profit margins almost five times greater than the FTSE 100 average, these privatised network companies are extracting wealth through dividend payments. From 2007-2011 to 2017-2021, the major GDNs have

increased their pay-outs from £440 million to £2.45 billion. In the same period the major DNOs paid out £3.63 billion. This is double the amount of tax that they have paid in the last five years. Interest payments on debt owed to shareholders and parent companies is another means to extract wealth and to reduce taxable profits. Since 2017, for the major GDNs and DNOs, these interest payments have totalled £928.3 million and £841.9 million, respectively. These incredibly high dividend and internal debt payments are ways for these companies to extract wealth from citizens, resulting in excessive energy bill payments. Taking these privatised network companies into public ownership would ensure that instead of wealth being extracted to shareholders, wealth would be shared by providing energy to citizens at a cheaper price, and surpluses would be used to invest in publicly owned infrastructure, driving the energy transition. In a paper published by David Hall in 2019, it was estimated that taking the privatised transmission and distribution companies into public ownership would cost £27.9 billion.

Energy supply

The UK domestic energy supply market has historically been dominated by the 'Big Six' - British Gas (Centrica), EDF Energy UK, E.ON UK, Npower, Scottish Power, and SSE. This market concentration has been exacerbated by the energy crisis, with rapidly inflating gas prices causing smaller energy suppliers to fold, leaving millions of citizens in need of transfer to a new supplier. Not only does this cause major disruption for citizens, but the public are expected to bear the cost of collapse, adding up to £2.7 billion for 28 failed energy suppliers since July 2021. It is important to underline that problems with this system did not emerge during the crisis, they are built into the system. The irrational separation present in the UK energy system means that privatised companies are able to extract wealth at every opportunity, from generation to transmission and distribution, ending with domestic supply. This drives prices up even further for citizens.

As of 2019, Ofgem reported that 61% of citizens had switched supplier only once or never. The 'Big Six' have been abusing this lack of mobility between suppliers and the concentrated market structure to extract wealth from the public. According to available data, between 2010 and 2020, the 'Big Six' spent £42.7 billion on dividends and stock buybacks, exceeding what they paid in taxes. This is money that otherwise could have gone to reducing energy bills. Just like the privatised transmission and distribution companies, they use interest payments on debt owed to shareholders and parent companies to extract wealth. The effective interest rate that they have paid on this debt is 4.1% over the ten years before 2020, well above UK government average rates of 2.5%, with costs incurred totalling £10.22 billion.

In addition to the clear economic arguments against privatised energy supply companies, it is important to highlight the ideological role that they play in maintaining the status quo. Using a whole system analysis uncovers how energy suppliers maintain the semblance of a free market, hidden behind which are monopoly privatised transmission and distribution companies. Therefore, it is logical for the proposed publicly owned Regional Energy Agencies and Municipal Energy Agencies to directly provide energy to citizens, eliminating the need for separate energy supply companies - themselves simple office-based operations. The existing energy supply companies should be brought into public ownership and their operations integrated into the REAs

and MEAs. Since 2019, the energy supply market has been dominated by the 'Big Five' - British Gas (Centrica), E.ON, EDF, Scottish Power, and Ovo. The TUC have reported a high-end estimate for taking the 'Big Five' into public ownership as £2.75-£2.85 billion. This is equivalent to the £2.7 billion that energy customers will be expected to pay to cover the costs of energy supplier failures since June 2021. In the absence of vast dividend and stock buyback payments, these REAs and MEAs would be able to provide energy to citizens at much lower prices.

Appendix

Independent public authorities with clear statutory responsibilities will be established to create the new publicly owned energy system. These will integrate energy companies brought into public ownership, themselves acquired through Acts of Parliament, known as compulsory purchase orders. Existing owners and shareholders will be compensated through bonds issued by the Treasury, making this process cost neutral, because bonds will be exchanged for profitable assets. Parliament will make deductions from the level of compensation offered based upon: pension fund deficits; asset stripping since privatisation; stranded assets (e.g., fossil fuel reserves that cannot be burnt whilst honouring our Paris Agreement obligations); the state of repair of assets; decommissioning costs; taxes that have historically been avoided; state subsidies given to the energy companies since privatisation; amongst other reasons. Existing debts will be carried over and refinanced so that the costs of debt are reduced.

A National Energy Agency (NEA) will be set up on the institutional base of the National Grid and Ofgem and will act as the strategic compass of the new publicly owned energy system, setting regional decarbonisation targets and overseeing the rollout of a national electric vehicle charging network. Some of the responsibilities of the NEA will be existing functions of electricity and gas transmission networks (owning, investing in, and operating transmission networks over long distances), whereas others (strategic long-term decision making, distributing costs, setting standards, and regulating the energy system) will build upon the current responsibilities of Ofgem. Based on the democratic governance of the NEA, this represents a clear democratisation compared to Ofgem, a technocratic institution largely insulated from democratic decision making. Because of their industries and assets being concentrated in one place, the NEA will own and oversee the operation of nationalised energy companies, encompassing fossil fuel extraction, offshore wind energy production, legacy nuclear reactors, and non-renewable energy generation. Since the privatisation of the energy system, there has been a failure to invest in staff training. To ensure that a transition to a decarbonised energy system is just, the NEA will coordinate national skills and workforce planning - in coordination with trade unions - so that all workers from the fossil fuel industry receive good, well paid, green unionised jobs on equal terms and conditions.

Regional Energy Agencies (REAs) will be set up on the institutional base of the 14 regional electricity Distribution Network Operators. Many of the responsibilities of the REAs will be existing functions of electricity and gas distribution networks - owning, investing in, and operating distribution networks. Additionally they will be responsible for decarbonising heat and electricity through investing in renewable energy capacity, developing electric vehicle charging networks, and supplying energy directly to households. Due to this role, they will play a considerable part in shaping regional industrial strategies, using their procurement and planning powers to create jobs and stimulate local economic activity, a pillar of community wealth building strategies. In concert with the NEA and trade unions, REAs will develop skills institutions and coordinate just transition pathways for workers in the fossil fuel industry.

Municipal Energy Agencies (MEAs) will map onto local authority levels of government, ranging from parish to city level. MEAs will have to request powers to be devolved from their respective

REAs, including ownership and operation of distribution and supply networks, enabling them to integrate networks with local generation and supply. This devolution of responsibilities will transition towards a more sustainable functioning of the grid, with MEAs supplying accurate data on energy supply and demand to REAs, who in turn will be able to balance the grid regionally. Unlike the NEA and REAs, MEAs will not be automatically set up, with local authorities having to demonstrate competencies, such as capacity and skills, access to capital, and democratic accountability. In contrast to the current privatised energy companies who have an incentive to keep data and practices secret, a network for MEAs will be established to promote peer-to-peer skill-sharing and collaboration.

Local Energy Communities (LECs) will be an innovative feature of a new publicly owned energy system, harnessing the enthusiasm of residents who want to decarbonise their energy supply. Communities at the level of a street, housing estate, or small village, will be able to establish cooperatives or community benefit societies to engage in generation, distribution, and supply of energy at the micro level. The genuine community ownership and control offered will be a means to build lasting support for publicly owned networks, creating community wealth, improving place, and addressing inequality. Like MEAs, LECs will not be automatically set up, with communities having to demonstrate competencies, such as capacity and skills, access to capital, community buy-in, and democratic accountability. To enhance the efficiency of experimentation and learning, a network of LECs will be established to promote peer-to-peer skill-sharing and collaboration.