RESOURCES *for the* FUTURE

EDF ENVIRONMENTAL DEFENSE FUND®
Finding the ways that work

Regional Just Transitions in the UK: Insights from 40 Years of Policy Experience

James Rising, Marion Dumas, Sophie Dicker, Daniel Propp, Molly Robertson, and Wesley Look

Report 21-14
December 2021

About the Authors

James Rising is a researcher in climate change policy at the University of Delaware. He studies the economic risks of climate change, integrating natural science and modeling to develop future scenarios. Previously, Rising was a senior researcher at the Grantham Research Institute on Climate Change and the Environment at the London School of Economics and has held research fellow positions at the University of Chicago and the University of California, Berkeley.

Marion Dumas is an assistant professor at the Grantham Research Institute for Climate Change and the Environment at the London School of Economics. Her research focuses on the role and efficacy of different policies and institutions in driving a low-carbon transition. Two cross-cutting themes are justice and innovation. Dumas holds a PhD from Columbia University and previously held a research position at the Santa Fe Institute.

Sophie Dicker is a policy analyst focused on climate change adaptation and resilience and strategies for delivering a just transition to a low carbon economy at the Grantham Research Institute on Climate Change and the Environment at the London School of Economics. She has a range of experience in the UK Parliament, having worked for the Shadow Minister for Climate Justice and Green Jobs, the Shadow Minister for Scotland, and the Shadow Foreign and Commonwealth Office.

Daniel Propp was a research intern for Resources for the Future from May 2020 to May 2021. He holds a BA from Dartmouth College and an MPA in energy policy from the Columbia University School of International and Public Affairs.

Molly Robertson is a research analyst at Resources for the Future. She graduated from the University of Michigan's Ford School of Public Policy in 2019 with a master's degree in public policy.

Wesley Look is a senior research associate at Resources for the Future. Previously, Look served as Advisor on Energy and Environment to the US Senate Finance Committee and ranking member Senator Ron Wyden (D-OR). Look advised Senator Wyden on a range of clean energy and climate policies, including the senator's energy policy portfolio on the Senate Energy Committee. From 2007 to 2010, Look advised US cities on climate and energy policy as Program Officer with the International Council for Local Environmental Initiatives (ICLEI).

About the Project

This report is part of a series of papers prepared by Resources for the Future (RFF), Environmental Defense Fund (EDF), and other partners that examine policies and programs to promote fairness for workers and communities in a transition to a low–greenhouse gas emissions economy, often referred to as a just transition. The series looks at existing public policies and programs, grouped thematically as "tools in the toolbox" for policymakers seeking effective strategies to address challenges associated with transition. We focus on policies and programs that can support workers and communities in regions where coal, oil, or natural gas production or consumption has been a leading employer and driver of prosperity.

About RFF

Resources for the Future (RFF) is an independent, nonprofit research institution in Washington, DC. Its mission is to improve environmental, energy, and natural resource decisions through impartial economic research and policy engagement. RFF is committed to being the most widely trusted source of research insights and policy solutions leading to a healthy environment and a thriving economy.

The views expressed here are those of the individual authors and may differ from those of other RFF experts, its officers, or its directors.

About EDF

Environmental Defense Fund (EDF) is one of the world's leading environmental nonprofit organizations. EDF's mission is to preserve the natural systems on which all life depends. Guided by science and economics, EDF finds practical and lasting solutions to the most serious environmental problems.

Sharing Our Work

Contents

1. Introduction **1**
1.1. Scope of This Report 3
1.2. Assessment Approach 3
1.2.1. Policy Design 4
1.2.2. Construction and Infrastructure Outcomes 5
1.2.3. Regional Aggregate Outcomes 5
1.2.4. Implicit Outcomes 6

2. Institutional Context **7**
2.1. UK Political Economy 7
2.2. Climate Policy Architecture 9

3. History of Coal Phaseout and Coalfields Transition Policies **12**
3.1. The Phaseout of Coal 12
3.2. Coal Policy Timeline 14
3.3. Types of Policy Response 17
3.4. Support for Workers 18
3.5. Support for Industry 19
3.5.1. Coalfields Funds 20
3.5.2. Regional Growth Fund 21
3.6. Support for Regions and Communities 22
3.6.1. National Coalfields Programme 24
3.6.2. Coalfields Regeneration Trust 25
3.6.3. Single Regeneration Budget 25
3.6.4. EU Cohesion Policy 26

4. Policy Outcomes and Lessons **28**
4.1. Outcomes 28
4.2. Timing of Support 30
4.3. Scale of Programs 31
4.4. Lessons from UK Transition Policies 33
4.4.1. Support for Workers 33
4.4.2. Support for Enterprises 33

4.4.3. Support for Regions 34
4.5. Comprehensive Planning 35

5. Energy Transition Today **37**
5.1. Current Policies to Support Workers – A Sampling 38
5.1.1. Skills Development Scotland 38
5.2. Current Policies to Facilitate Integrated Planning – A Sampling 39
5.2.1. City Region and Growth Deals 39
5.2.2. Scotland: Just Transition Commission 41
5.2.3. Wales: Well-Being of Future Generations 42
5.2.4. Wales: Prosperity for All 42
5.3. Preliminary Assessment of New Approaches 43
5.3.1. Support for Workers 43
5.3.2. Integrated Planning Strategies 44

6. Conclusion **45**

7. References **47**

1. Introduction

The industrial economy is expected to experience vast changes over the next 20 years as clean energy technologies displace fossil fuels. These transformations will create opportunities and challenges, with many workers needing new jobs and many communities requiring new engines of growth. Such changes are an inherent part of a dynamic economy, but the risks that emerge from the transition to a low-carbon economy are distinctive. Unlike other economic transformations, a rapid clean energy transition will likely be the result a vast collective choice facilitated by sweeping new policies. Although it will produce great benefits globally by arresting and reversing growth in greenhouse gas emissions, without some measures to offset the effects on local labor markets and economies, this transition will also impose hardships on people and regions connected to fossil fuel–dependent industries.

Consequently, policies need to engender a "Just Transition," with participatory decision-making processes and equitable sharing of the benefits and costs of transition. The concept of a Just Transition has multiple dimensions. In the broadest sense, it encompasses two criteria. First, the benefits and costs of a sustainable transition of a country's economy are fairly distributed. For example, low-income consumers should not be made to face exorbitant costs from the need to transition to alternative fuels or forms of transportation. Second, an environmentally sustainable transition should promote inclusive growth by "contributing to the goals of decent work for all, social inclusion and the eradication of poverty" (ILO 2015). For a Just Transition, three groups need to be considered: consumers, workers in particular industries, and members of communities in the affected regions.

Green and Gambhir (2020) identify three types of policies to support those three groups. First are compensation policies that compensate for financial loss, such as redundancy benefits for workers, revenue replacement grants for local governments, and tax incentives to corporations. Second are structural adjustment policies, such as training support for workers, R&D subsidies for corporations, and infrastructure investment for communities. Finally, comprehensive adaptive support policies promote an integrated approach to helping people and places adapt to new conditions by coordinating decarbonization planning, seeking reemployment of workers in cleaner industries, and developing new sources of local revenue and public goods provision.

Box 1. Just Transition

The BlueGreen Alliance (2015) explains Just Transition this way:

> A transition to the clean energy economy requires the resources, policies, and priorities needed to retool our nation, create family-sustaining jobs, strengthen and grow no- and low-carbon sectors—including energy efficiency, renewable energy and commercial carbon capture and sequestration (CCS) applications—and ensure our communities are healthy and safe. ... The wealth of this nation, and indeed the global economy, has been built on the contributions of millions of workers in carbon-intensive industries. These workers should not be cast aside. Workers should not be forced to choose between a better environment and family supporting wages.

Past economic transitions have posed challenges similar to those presented by today's energy transition: new technologies that reshape industries always create winners and losers; liberalization and trade can undercut wages and eliminate jobs; regions that boom by specializing under one economics regime go bust under another. As workers, industries, and communities struggled, governments were prompted to intervene to provide transitional assistance. In the United Kingdom in particular, the transition away from coal is a case in point. Coal mining reached a peak employment of 1.1 million miners in 1913, then fell to a complete closure of major mines in 2015. This coal-sector transition was compounded by an economy-wide deindustrialization of the UK economy as other heavy industries, such as iron and steel manufacturing and shipbuilding, also declined.

The United Kingdom has tried a dizzying array of policies, at multiple levels of government, to address economic transitions. Although some policies provide lessons for future transitions, many lessons are the result of past failures. The response of the UK Government to momentous change in the coal sector was mostly reactive. Targeted policies to support economic transition were enacted only after the coalfields and industrial areas were beset by social and economic problems. The response was fragmented, creating an inconsistent set of regeneration policies. Funding was small, given the scale of national economic policy and the economic forces that were exacerbating inequality. Most of the coalfield regions remain poor, and regional inequality is among the highest in Europe (Martin et al. 2016) .

Box 2. Regeneration

In many cases, the UK policy goal for economic transitions—including the energy transition—is regional regeneration, which the Government of Scotland defines as "the process of reversing the economic, physical and social decline of places." The concept of regeneration is applied both to former coal regions and to other pockets of poverty and postindustrial "wastelands." Regeneration comprises closing poverty gaps, remediating land, raising the local employment rate, and reinvigorating the economy. The UK concept of regeneration builds on Indices of Deprivation (Box 3) but is very similar to revitalization as discussed in the United States (Fitzgerald and Leigh 2002).

In some respects, the United Kingdom has played a leading role in climate change policy. Since 2001, it has imposed a climate change levy on top of the costs imposed by the European Union's Emissions Trading Scheme, thereby driving fossil fuels out of its national energy mix. The Climate Change Act of 2008 included the first legally binding mitigation target set by a country, and an amendment in 2019 committing the United Kingdom to net-zero by 2050 made it the first major economy to have such a goal. The Climate Change Act of 2008 also established the Climate Change Committee, a powerful independent statutory body that advises government, issues strategic reports, serves as a custodian of UK climate policy, and monitors progress toward the long-term objectives set in the act (Fitzgerald and Leigh 2002).

Internationally, the United Kingdom launched the Powering Past Coal Alliance in partnership with Canada in 2017 to support national and subnational governments, businesses, and organizations in the transition from unabated coal power generation to clean energy. The alliance has more than 100 members, all seeking to phase out the use of coal globally.

Those policies and initiatives, intended to help ensure a sustainable future for the world, have led to a shift in the UK economy, leaving many businesses, workers, and communities behind. In this report, we focus on workers and communities. We review both historical policies for the coalfields and distill lessons for future Just Transition policy from regional regeneration in the United Kingdom. However, the central lessons are to not rely on regional regeneration alone to redress shocks and to anticipate and prepare for disruptive transitions. We also review recent policy developments that suggest the way forward, toward an integrated, whole-government project focused on inclusive clean energy growth.

The remainder of this section describes our scope and our approach to assessing policy outcomes. Section 2 provides brief background on the UK institutional structure and climate policy. Section 3 reviews historical coal transitions in the broader context of regional regeneration policies in the United Kingdom. This discussion highlights the changing ideologies in government over the past 50 years, from a reliance on market-based mechanisms to an emphasis on localization. Section 4 assesses those policies and their outcomes. Section 5 discusses the recent evolution toward integrated policy approaches to fossil fuel transitions in the UK. Finally, Section 6 brings this experience together to offer recommendations for future policymaking.

1.1. Scope of This Report

This report examines policies that aim to support workers and regions dependent on the fossil fuel economy, as well as relevant policies for other industries and economic transitions. We include policies that provide social support, economic management, and stakeholder engagement.

Our coverage is far from complete, however. A comprehensive discussion of the role of the social welfare safety net is beyond the scope of this report. In many cases, we examine just one exemplative policy from a class. For example, government institutions for training workers are represented here by Skills Development Scotland, but there are similar skills centers and programs throughout the United Kingdom. Until recently, Further Education colleges were a focal point for skills development, and they continue to receive considerable government funding. In many cases, the policies we cover have provided funding for a long list of region-specific initiatives, which we do not discuss in detail.

Other dimensions also crucial to Just Transition lie beyond the scope of this report; in particular, fiscal reform to ensure that the cost of financing and incentivizing the transition does not disproportionately fall on lower-income groups and that everyone can afford to switch to low-carbon lifestyles.

1.2. Assessment Approach

The policies in this report can offer starting points for new policy design. Planning for future transitions should be based on the best available practices, drawn from policies that have succeeded and are appropriate to each context. Administrative structures, funding arrangements, engagement processes, and auditing processes are all components of a successful policy: they support the policy's ability to produce beneficial outcomes, on which the policies should be evaluated.

Most of the policies we consider were not intended to deliver a Just Transition, and neither the level of justice nor the extent of transition have been criteria for their evaluation. However, several are specifically targeted at poor regions and groups. In some cases, that poverty is a historical consequence of a past transition from coal. The outcomes that such policies have been evaluated on—their ability to produce features of a successful economic revitalization—are directly applicable to policy evaluation seeking to identify successful Just Transition practices.

Two major challenges arise. First, since the intended outcomes, particularly jobs, new infrastructure, and economic growth, are the result of many drivers in a diverse economy, it is difficult to attribute benefits to the policies. Even where policies can identify direct benefits, such as the new jobs at a funded plant, the true benefits of a policy include indirect effects, such as the regional growth that accompanies new plants. Second, the full effects of policies can take decades to emerge. Even where immediate changes are observed, policies should be evaluated on the longevity of these benefits. Many of the recent policies considered here, however, have not been in place long enough for thorough analysis or observation of their full ramifications.

An important concept in the evaluation of regional development support is "additionality": "the extent to which something happens as a result of an intervention that would not have occurred in the absence of the intervention" (English Partnerships 2008). In the United Kingdom, the evaluation of additionality is guided by the Additionality Guide, which highlights that additionality may emerge in terms of the scale, timing, area or group specifics, and quality of outcomes. Additionality is then evaluated with respect to a baseline reference case, which comprises both external and endogenous trends in the economy.

Many of the policies we consider have been the subject of National Audit Office reports, academic and institute analyses, or statutory evaluation processes designed into the policies. The following outcomes and metrics have been used across the policies considered here.

1.2.1. Policy Design

- Beneficiaries: Is the policy selective and successful in its targeting, to support those most in need?
- Completion of the policy: Were all allocated funds used and did the policy continue to function through the end of its intended duration?

1.2.2. Construction and Infrastructure Outcomes

- Acres remediated: Mining and industrial sites often make areas unsuitable for housing or for other forms of commerce. Remediation either returns the land to something approaching its original condition or decontaminates it and prepares it for other infrastructure.
- Homes and other real estate: Homes and commercial floorspace are a good proxy for the successful return of land to productive use.

1.2.3. Regional Aggregate Outcomes

- Jobs created: This includes both direct jobs created, if supported industries have expanded, and indirect jobs, if a region is generally made more prosperous. Identifying both direct and indirect jobs created can be challenging in a dynamic economy.
- Incomes and growth rates: Regions that have lost their economic engine can slide into a prolonged recession. Regional economic growth rates provide a high-level measure of the success of policies. The goal for many policies is to ensure convergence with UK-wide incomes.
- Joblessness: Total levels of joblessness may be a better metric for capturing the direct and indirect job creation.
- Deprivation: An important benchmark for economic growth is the Indices of Deprivation.

Box 3. Deprivation

The UK Government uses Indices of Deprivation to gauge relative standards of living across the country. "Deprivation" builds on the idea of multidimensional poverty (Alkire and Foster 2011) by acknowledging that factors beyond income affect individuals' level of need.

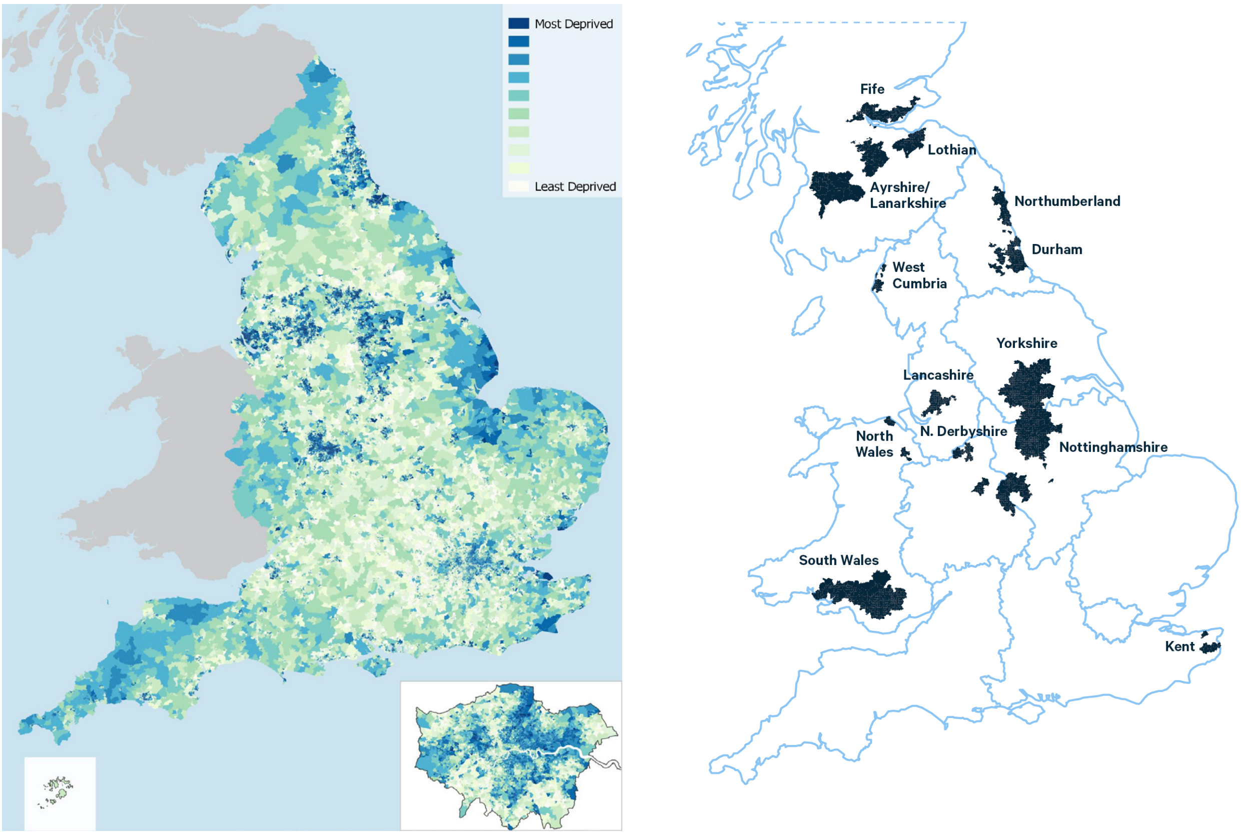
Since 2000, the Ministry of Housing, Communities, and Local Government has periodically ranked every locality in England for its level of deprivation. The resolution of the data is at the level of a neighborhood, called a lower-layer super output area (LSOA); there are 32,844 LSOAs in England. At present, the Indices of Deprivation do not apply to Scotland, Wales, or Northern Ireland.

The rankings draw on 39 indicators organized into seven categories (weighted): income (22.5 percent), employment (22.5 percent), education (13.5 percent), health (13.5 percent), crime (9.3 percent), barriers to housing and services (9.3 percent), and living environment (9.3 percent). The results is a relative rather than absolute score for each area: the rankings can indicate which of two localities faces a higher level of deprivation but do not reliably measure whether one has become more or less deprived over time, nor is the 100th-most deprived area necessarily twice as deprived as the 200th-most deprived.

The Indices of Deprivation are used to allocate means-tested welfare and support programs and to evaluate grant and loan applications. The data also serve as the evidence base for national and local development strategies. The indices are publicly available so that nonprofits and social enterprises can use them to target support as well .

Because England's coalfield communities are commonly among its most deprived localities (Figure 1), several policies for coal communities rely on the Indices of Deprivation to assess need. For instance, some programs run by the Coalfields Regeneration Trust in England specify that support is available only to communities that fall within a certain decile of the index.

Figure 1. Correspondence between Deprivation and England's Coalfields



Source: (Left) Ministry of Housing, Communities & Local Government. (2020). The English Indices of Deprivation 2019 (IoD2019). (Right) Beatty, C., Fothergill, S., & Gore, A. (2019). The State of the Coalfields 2019: Economic and social conditions in the former coalfields of England, Scotland and Wales. Sheffield Hallam Universiuty.

1.2.4. Implicit Outcomes

- Private funding leveraged: Private funding, an input to policy projects, is also an important outcome, since it reveals a lower bound on the value of the policy. Figure 7 (Section 4.2) shows the wide range of private funding multipliers for some policies.
- Cost-effectiveness, or value-for-money: The price tag for revitalizing regions is incredibly uncertain, with some light-touch policies bringing about huge job growth and some decade-long approaches costing a huge amount and producing few results.

Many of the policies that we discuss were not narrowly focused on any of the above metrics but instead had broader social goals, such as crime reduction, community cohesion, and improved health outcomes. Tension exists between the evaluation of policies using clear metrics and the comprehensive consideration of these policies within their varied contexts.

2. Institutional Context

The United Kingdom is a unitary state made of four nations: England, Scotland, Wales, and Northern Ireland. Following the devolution acts of 1998 (Kerslake 2018), Scotland, Wales, and Northern Ireland gained executive and legislative powers over a range of policy areas, while English affairs continue to be decided by the UK-wide Westminster Parliament. Devolved policy areas differ for each nation (Kerslake 2018), but all nations' policy responsibilities include some areas that are core to a Just Transition: health, education, training and skills, environmental policy, and local governance and economic development. The UK Government and Parliament remain responsible for "reserved" policy matters, including macroeconomic policy, industrial strategy, and energy policy.

The UK Government drafts bills and develops policies; Parliament reviews, amends, and votes on bills, and monitors and oversees policy implementation. In the UK-wide government, the most important ministry for Just Transition is the Department for Business, Energy and Industrial Strategy, which is a merger of the former Department of Energy and Climate Change and the Department for Business, Industry and Skills. Other relevant ministries are the Departments of Education; Housing, Communities and Local Government; and to a lesser extent, Environment, Food and Rural Affairs.

Aside from the devolved authorities, there is no intermediate level of government between the central governments and local authorities (county and district councils). Economic development policies are generally most successful when they address issues endemic to an entire region, rather than just one city (Pike et al. 2015). But with governing authorities restricted to narrow jurisdictions, the structure forces awkward cooperation and balancing of authority.

Until Brexit, UK policy was developed within the EU framework, whereby EU institutions set many environmental and health standards, distributed funds for regional development, regulated subsidies for businesses, and funded collaborative research and development in strategic areas.

2.1. UK Political Economy

To understand the logic and the outcomes of individual policies, it is important to understand how the UK political economy is organized and its basic approach to transitions that affect local labor markets, communities, and regional economies. Critical elements include public finance, the approach to local economic development, and the welfare state.

One characteristic of the UK political economy is its high level of centralization. Indeed, the public finance system is one of the most centralized among OECD countries. Most tax revenues (95 percent) are collected by the central UK Government and are then redistributed. The devolved administrations are funded through a combination of local taxation and block grants from the UK Government. However, only local authorities have the power to raise revenue through a property tax. They also retain (but do not set) 50 percent of business rates collected in their jurisdiction. The rest of their funding comes from government grants. Overall, they are responsible for spending only 20 percent of the total public budget (of which less than half is raised by the local authority), mostly in the areas of housing, environment, education, and public safety (European Committee of the Regions). This means that the central government controls budgets for areas such as skills, regeneration, housing, employment, and business support, which in other countries are often organized at a more local or regional level (Martin et al. 2016).

Another characteristic of the United Kingdom is its liberal market economy. Like the United States, it relies primarily on market forces to organize economic activity, rather than joint decisionmaking between the state and social actors, as in coordinated market economies like Germany. This reliance on markets has important consequences for a Just Transition, in particular because the United Kingdom has a high level of regional economic imbalance. In fact, it is one of the most regionally unequal economies in the European Union.[1] This pattern is longstanding but has been exacerbated over the past four decades with deindustrialization and the growth of the service sector (financial services in particular). The institutional organization described above is thought by some to be a fundamental obstacle to rectifying the regional imbalance.

Box 4. For Future Research: How Does Policy Context Affect Outcomes

A fuller understanding of the potential and limits of place-based regional policies, and their role in Just Transitions to low-carbon economies, requires a meta-analysis of cross-country policy evaluations, with a synthesis of how policy design and context interact to affect outcomes.

We have highlighted the potentially determining role of national-level economic institutions—those relating to education, access to finance, and regional flows of public funds. Understanding which national-level institutions may restrict a region's capacity to adapt is an important future research agenda for Just Transitions. Indeed, these national-level structures may powerfully constrain what transition assistance policies can achieve. In that case, understanding their effect can help us formulate more realistic aims for transition assistance policies, and realistic baselines against which to measure the success of targeted policies. More ambitiously, a Just Transition agenda calls for the reform of national-level institutions and policies that prevent inclusive green growth for transitioning regions.

Many of the local economic development policies described in this report can be understood as attempts to fix spatial imbalances and compensate for the absence of an intermediate level of governance without fundamentally reforming the system. One current approach is to develop strategic plans in concert with large metropolitan combined authorities (e.g., the Greater Manchester Combined Authority) and then devolve new policy responsibilities to these authorities, which are meant to push forward the strategic plan. These "devolution deals" are thus bespoke agreements between government and large combined authorities in an attempt to energize a bottom-up process of initiatives for local development coordinated with top-down funding and national objectives (such as the net-zero transition and the digital transition).

1 The UK has a 0.45 coefficient of variation in GDP per capita per NUTS2 regions in 2011, versus 0.23 in Germany and 0.19 in France.

As a liberal market economy, the United Kingdom has an unregulated labor market: wages are set by the market, not by collective bargaining agreements with unions, and employment is weakly protected. Workers' main resource to adapt to economic change is therefore what is offered by the welfare state. The UK welfare system is a means-tested, flat-rate benefit system at the subsistence level, aimed at poverty prevention. In this sense, although based on worker contributions, it is not a social insurance program (Bonoli 2013). Universal Credit is the core element of the United Kingdom's current welfare system for people of working age who are unemployed, on low income, or suffering from a disability. Introduced in 2013, it aims to streamline a range of previously available benefits and increase incentives to return to work. Universal Credit is administered by the Department for Work and Pensions and managed at the local level by job centers, although claimants are expected in most circumstances to make and manage their claims online.

The main approach to unemployment is to create incentives for individuals to reenter the labor market; a lower priority is given to investment in human capital and training (Bonoli 2013). And indeed, the data show higher spending on public employment services (which assist in job searches) than on training. Furthermore, the UK system shows a high level of the "activation" paradigm, aimed at creating strong incentives for returning to work. For example, claimants of Universal Credit must agree to a commitment with a designated work coach, which often includes writing a CV, looking for and applying for jobs, attending training courses, and accepting job offers even at a lower salary. If the agreed responsibilities are not met, sanctions to stop or reduce Universal Credit payment amounts are imposed.

The National Health Service is another pillar of the welfare system. It provides free health care at the point of use and therefore protects against any changes in health care access related to employment status, unlike in the United States.

Overall, the baseline unemployment and active labor market policies of the United Kingdom are not well fit for a Just Transition, given the low emphasis on training, the absence of wage insurance, and the cuts in social spending since the turn to austerity—the agenda for balancing budgets through sharp reductions in public spending—following the 2008 financial crisis. In these respects, the United Kingdom compares more closely with the United States than with many European countries.

2.2. Climate Policy Architecture

Passed into law in 2008, the United Kingdom's Climate Change Act was one of the first comprehensive climate laws to be adopted globally. It provides a whole-economy governance framework to guide action. Central features include a statutory long-term emissions target; statutory five-year carbon budgets[2]; frequent adaptation planning; an independent advisory body, the Committee on Climate Change; and mandatory progress monitoring and accountability.

2 Once a carbon budget has been adopted, the act mandates the responsible secretary of state to bring forward proposals and policies to meet the legislated target.

Targets set out in the act are United Kingdom-wide, and much of the implementation is assigned to the UK Government and Parliament, but there is also an explicit and significant role for the devolved administrations of Scotland, Wales, and Northern Ireland. (Similar provisions for councils, cities, and the English regions, however, are lacking.) Devolved administrations have powers to set climate targets and develop climate strategies. For example, Scotland and Wales subsequently passed their own laws and policies: the Climate Change (Scotland) Act 2009, replaced later by the Climate Change (Emission Reduction Targets) (Scotland) Act 2019, and the Wales and Welsh Assembly Government (2010) and Environment (Wales) Act 2016.

The Climate Change Act coordinates progress on many issues, including institutional and political change (Fankhauser et al. 2018). According to an evaluation in 2018, it has "transformed the way in which the political debate on climate change is conducted. The Act has created a routine of target setting, parliamentary scrutiny and reporting" (Fankhauser et al. 2018). Notably, in 2019, the statutory long-term emissions target was amended, committing the United Kingdom to achieving net-zero emissions by 2050 and improving on the previous 80 percent reduction target.

As highlighted by Fankhauser et al. (2018), rather than starting from a tax-based (social cost) approach or regulation (social protections) approach, the act is target oriented, giving a significant role for the state but also allowing for a role for markets.[3] It is specific to climate change rather than embedded in a wider environmental context, and it requires a further package of policies to underpin sustainable development.

Monitoring and evaluation mechanisms built into the act include a mandate for the independent Committee on Climate Change to produce annual progress reports, detailing whether the government is on track to achieving its carbon budgets. Parliament debates these reports, and the government has a statutory obligation to respond. For each budgetary period, the UK Government must report to Parliament on policies and proposals to meet the carbon budgets. The Committee on Climate Change also analyzes policy performance over a budget period, with deadlines set out in the act. It advises the devolved administrations as well.

Perhaps the act's most significant achievement, beyond building and maintaining consensus on climate change, has been driving the transition to a low-carbon economy through the transformation of the power sector over the past 12 years. This has helped the United Kingdom to meet its first two carbon budgets and to decouple greenhouse gas emissions from growth (Fankhauser et al. 2018). The independent reporting process carried out by the Committee on Climate Change has also established a robust empirical base that is widely accepted (Fankhauser et al. 2018).

However, the Climate Change Act has shortcomings, and a range of suggestions have been made to amend it and improve its implementation, including a statutory response time for carbon plans, clearer criteria for assessing compliance, and improved communications with the public (Fankhauser et al. 2018). Notably, increased political

3 See additional details at **https://www.instituteforgovernment.org.uk/sites/default/files/climate_change_act.pdf.**

will and buy-in across government departments is needed to ensure that the policy outcomes of the act are achieved. For example, the United Kingdom is not currently on track to meet its fourth and fifth carbon budgets[4] (Stark et al. 2019).

4 These budgets were also set under the original 80 percent goal by 2050, and are thus too weak in themselves to meet net-zero.

3. History of Coal Phaseout and Coalfields Transition Policies

The United Kingdom is at once at the forefront of climate policy ambition and still reckoning with the mistakes of its 20th-century coal phaseout. In this section, we begin by explaining the history of coal's decline in the UK, followed by a discussion of the successive policy paradigms that have shaped the response to regional transitions over the years—in particular, the regions affected by deindustrialization and coal mine closures. In the latter half of this section we organize the UK policies designed to assist in this transition according to the stakeholder communities highlighted by Green and Gambhir (2020): workers, industry, and regions and communities.

3.1. The Phaseout of Coal

Coal in the United Kingdom was phased out in several stages. The 1960s saw a large wave of closures, with employment halving, from 607,000 to 290,000. In the early 1980s, coal mining directly employed more than a quarter of a million people in 211 mines in 17 coalfields[5] in Wales, Scotland, and England. In many coalfields, coal mining was the primary industry. Together, these regions accounted for about 8 percent of Great Britain's population (Beatty and Fothergill 1996). Between 1984 and 1997, 141 mines closed, eliminating 170,000 jobs, as the Conservative government pursued a policy of withdrawing public support to unprofitable heavy industries, in particular steel and coal, by privatizing them and closing unprofitable sites. The power sector was also privatized and allowed to pursue gas power generation, which had become cheaper than coal. The drastic and abrupt policy of closure and workforce reduction was, according to historians, directed against the powerful coal miners' unions, which Prime Minister Margaret Thatcher wanted to weaken (Moore 2016). This transition was based on bitter conflict, marked by the coal strikes of 1984–1985.

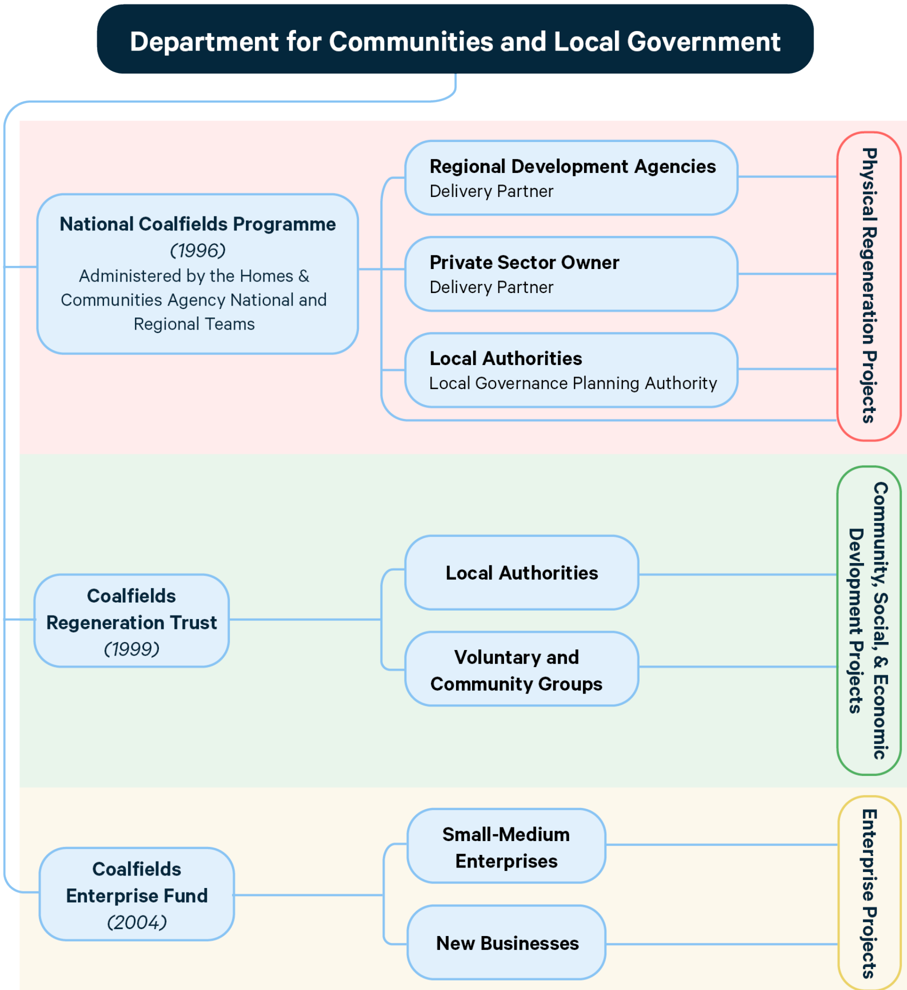
By 1997, jobs in the industry had dropped by 90 percent. The communities in and around coalfields saw a dramatic increase in joblessness, outmigration, and poverty. In many cases, the miners themselves did not experience the worst outcomes, as they had relatively strong prospects for finding jobs elsewhere or got long-term disability payments (Beatty et al. 2007). But the coal regions entered a long-term decline and developed a culture of low employment (Beatty and Fothergill 1996). Mines fell into disrepair, posing a threat to local ecosystems and public health. For 15 years, no specific policy was put in place to support these regions, although most of them qualified for funds from the European Union's cohesion policy (Section 3.6.4).

In 1998, at the initiative of the association of coal mining local authorities, the Coalfields Task Force Report was published. It recommended a package of three policies: the National Coalfields Programme (Section 3.6.1), the Coalfields Regeneration Trust

5 A coalfield is a set of contiguous districts in which at least 10 percent of the males in employment worked as a coal miner in 1981.

(Section 3.6.2), and the Coalfields Enterprise Fund. Figure 2 depicts their institutional organization.

Figure 2. Organizational Structure of the National Coalfields Programme, Coalfields Regeneration Trust, and Coalfields Enterprise Fund



Source: National Audit Office (2009).

The coalfields also benefited from more broadly targeted regional policies that have helped alleviate poverty, joblessness, and dereliction but generally have not been sufficient to restore the economic health of these regions (Figure 3; Beatty et al. 2007).

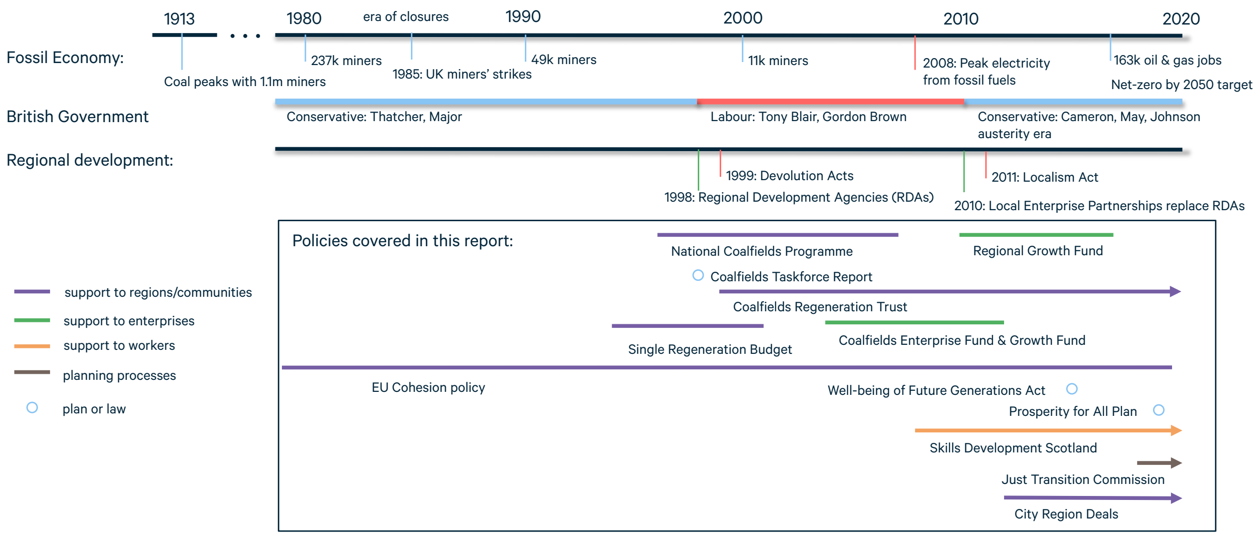
Figure 3. Former Coalfield Areas

Source: Beatty et al. (2019).

3.2. Coal Policy Timeline

The timeline in Figure 4 places the economic and policy history of UK coal mining against the evolution of the fossil economy and the changes in governments and serves as an introduction to a more detailed description of the policies.

Figure 4. Timeline of Transition Policies



The policies named in Figure 4 are only a subset of all relevant policies. We chose them to represent, over time, the types of policies we deem relevant to Just Transition (Section 3.3) so that we can learn from the successive policy paradigms.

We identify four main phases of policy paradigms.

1980s: Narrow compensation for miners, market approach to regional development

The decade of the 1980s was marked by economic policy changes that fundamentally restructured the UK economy. The monetarist policies of the Thatcher government led to the growth of the financial services sector (in the South) alongside the decline of manufacturing and coal production (in the North) (Kitson and Michie 2014). This was accompanied by a large and persistent rise in unemployment and poverty. At the same time, Thatcher's 1979 government greatly reduced regional assistance programs (business assistance to address regional imbalances), the main regional policy of the previous 50 years, and urban aid. The paradigm of this period was that economic growth and market-based solutions would solve social problems via a trickle-down process. Therefore, interventions in deprived regions were mostly economic, designed to promote market activity through private sector engagement, rather than social. Furthermore, the private sector was seen as an essential stakeholder for the delivery of policies; both local authorities and the third sector (nongovernmental organizations) were sidelined. For example, urban development corporations, set up to work on development projects, had board members appointed by central government and were composed of businesses and local authorities. They lacked democratic process and community involvement and focused on flagship projects, hard infrastructure targets, and property-led regeneration. With their narrow focus and lack of comprehensive urban planning, these corporations created "islands of renewal in seas of decay" (Imrie and Thomas 1993).

The 1980s was also the period of confrontational, forced closure of coal mines and other heavy industrial plants. At the time, most mines were publicly owned by British Coal Corporation (BCC, privatized in 1994). It and the government pursued a policy of providing narrowly targeted support for workers. In particular, if it expected a particular mine to close, the BCC would offer workers an option of early retirement or shifting to another mine. This eased to some extent the transition for directly affected workers.[6] However, these closures were a major shock on the local labor market, causing a dramatic drop in participation in the labor force and an increase in outmigration. Indeed, about 10 percent of working-age males were moved into disability benefits, other long-term government schemes, or early retirement (Beatty and Fothergill 1996). This high level of incapacity pay has remained surprisingly stable, suggesting that rapid deindustrialization with no transition plan casts a long shadow (Beaty and Fothergill 1996).

1990–1997: Early Regeneration Programs

As poverty rates and regional disparities increased and voices rose to criticize the policies of the 1980s (Perchard 2013), regeneration policies were developed in the early 1990s to tackle regional deprivation. The regeneration paradigm reflected shifts in thinking about poverty globally in light of the failures of the Washington Consensus and the closer association between the United Kingdom and Europe following the Maastricht Treaty (Palley 2005).[7] The most noteworthy policies were the City Challenge (started in 1991) and the Single Regeneration Budget (SRB, started in 1994; Section 3.6.3). Both emphasized the creation of partnerships of the private, public, and third sectors and promoted community engagement. Both also used competitive bidding, which was meant to identify new opportunities rather than focus only on needs. Importantly, the SRB promoted a more regional approach rather than highly localized and spatially defined interventions. This was facilitated by the creation of the government offices of the regions (representing central government in the regions) and regional development agencies.

During this period local authorities in the coalfields organized to advocate for the neglected regions, and in response, the Coalfields Task Force was established in 1997 to scope the situation and draft recommendations.

1997–2010: Regeneration and Area-Based Policies to Combat Social Exclusion

The New Labour government saw poverty and regional disparity as deeply structural, emerging from long-term exclusion from labor markets and multiple, spatially concentrated disadvantages. The new agenda was signaled by the creation of the Social Exclusion Unit in the Cabinet Office (CREW 2012). Local, regional, and regeneration policies—the so-called area-based policies—were considered critical to the broader strategy of combating poverty by tackling social and employment

6 Personal communication, S. Fothergill, Sheffield Hallam University, 09/16/2020.

7 The Washington Consensus (1989) recommended free-market policies for developing countries. The Maastricht Treaty (1992) set forth the basis for the European Union.

exclusion. This coincided with the move to devolve the powers of the centralized UK Government; the governments of Scotland, Wales, and North Ireland developed their own approaches. The result was diversity in policy experiments and governance structures.

The coalfields policies followed the 1998 recommendations of the Coalfields Task Force and were in line with this new agenda: they stressed the need to go beyond physical remediation and infrastructure and focus on the social issues affecting these regions.

2010–2020: Austerity and the Localist Approach

This period saw stark austerity policies and an attempt to have local authorities and local actors be responsible for creating local growth. The localist approach, in which government plays a strategic and supportive role but does not define or administer the regeneration agenda, appeared most strongly in England, with several noteworthy developments. First, the regional development agencies, which coordinated funding for economic development, and the government offices of the region were replaced by 38 local enterprise partnerships (LEPs) between civic and business leaders with a growth agenda and 24 enterprise zones. LEPs illustrate the extent to which the central government backed away from taking responsibility for regional development: no legal framework was created to delineate the partnerships' goals, powers, or administration, and until recently they had no dedicated public funding. Second, devolution deals and city-region deals were created, in which local actors articulate a long-term growth strategy and negotiate commitments from the UK Government to support implementation and the extent of devolved powers.

Also in this decade, the notion of Just Transitions was articulated by the International Labour Organization (ILO 2015). In the United Kingdom, new policies, plans, and commissions are starting to define a proactive approach to prepare local economies and workers for decarbonization and the opportunities presented by green growth policies.

3.3. Types of Policy Response

Green and Gambhir (2020) identify different approaches to managing just transitions, ranging from narrowly targeted and reactive responses to transition problems to broad-spectrum, proactive approaches. The range of policies applied to the coal transition is much narrower, due to the lack of anticipatory policies to help workers, industries, or communities prepare for the transition. However, workers did benefit from a baseline of support available through the basic infrastructure of the welfare state. As the challenges faced by workers became regional challenges, and as the solution to regional challenges were sought through industry support, new approaches were introduced. At least a decade after the crises of mine closing, these new policies aimed to support enterprise development, coalfield communities, and regional economies.

As can be seen in Table 2, the funding available for these policies differs radically, from the small-scale funding available through the Coalfields Funds (£2.3 million per year) to the Single Regeneration Budget, which brought together £713 million per year from a suite of preceding programs. Although their scale differs, each policy has played an important role in the government's attempts to regenerate the coalfields, and each provides lessons for future policy.

Table 1. Financial and Regional Scale of Major Policies

Policy	Years	Region	Annual funds (millions)
Single Regeneration Budget	1994–2001	Deprived areas	£713
National Coalfields Programme	1996–2017	107 sites	£37[a]
Coalfields Funds (Enterprise and Growth)	2004–2014	Eligible coalfield wards	£2.3[b]
Regional Growth Fund	2010–2017	Assisted areas	£425
City Region Deals (England, waves 1-2)	2012–present	28 large cities	£127[c]
City Region Deals (Scotland)	2014–present	6 regions	£104[d]
City Region Deals (Wales)	2016–present	2 regions	£62[e]

Notes:
a. £387 was allocated at the inception of the National Coalfields Programme, for 1996–2006. The program was later extended to 2017 without additional funding, but we report annual funds only through 2006.
b. The Coalfields Enterprise Fund existed from 2004 to 2014, with total public funding of £20 million, and the Coalfields Growth Fund existed from 2009 to 2014 with £5 million in public funds.
c. Wave 1 deals were allocated £2.3 billion over 30 years; wave 2 deals have been allocated up to £1.5 billion.
d. Scottish deals have spans of 10 to 20 years. We have taken the average over 20 years, including both Scottish and UK government commitments. Only deals for Glasgow, Aberdeen, Inverness and Highland, and Edinburgh and South East Scotland are included. Data from Audit Scotland (2020).
e. Includes the Welsh and UK government contributions to the Cardiff and Swansea Bay deals, over the 20-year commitment specified for the Cardiff deal. Data from Ward (2020).

3.4. Support for Workers

Workers are the most directly affected group in the transition away from fossil fuels. However, in the historical transition away from coal, the government's policies were focused on privatization and accelerating the closure of uncompetitive mines; they showed little support for workers. The main tool for supporting workers, aside from the welfare state, was the British Coal Enterprise (BCE), a subsidiary of the state-owned British Coal Company, tasked with replacing the jobs lost in the coalfields. Here we review what happened to workers at the time of the historical transition; in Section 5.1, we describe current support for workers in the low-carbon transition.

The BCE was set up in 1984 to help create jobs by supporting small and medium-sized enterprises (SMEs) and to assist miners in job search and training. Its main activities were to operate a loan scheme for small businesses and to provide job search support for miners, with some retraining programs. When a pit was scheduled to close, BCE would set up "job shops" on the site. Fothergill and Guy (1994) estimated that the BCE managed to replace about one in 14 jobs lost in the coalfields.

Overall, qualitative evidence suggests that the BCE did not meet the needs of ex-miners and that their assistance was instead taken up by others in the coalfield communities with higher educational backgrounds. In 2004, Murray et al. (2005) interviewed just over 40 men who had worked in seven of the South Yorkshire coal fields and whose families had been involved in mining for generations. The interviews, focused on workers' experience with reemployment and retraining, revealed the obstacles that laid-off workers faced. First, 60 percent received no retraining or help with job search and applications. Among workers who received career advice and retraining opportunities, most reported a negative experience. Career advisers seldom asked workers what jobs they would like to retrain for but instead seemed to think that ex-coal miners, especially pit workers, were too uneducated and unadaptable to be retrained. Workers had to be on benefit schemes for six months before being allowed access to retraining. By that time, they usually had developed a pessimistic outlook and low confidence. Although they clearly had vocational skills in various trades, as well as management skills due to the intense teamwork required in coal mining, they were not encouraged to identify transferable skills. More than 50 percent considered self-employment as tradesmen but were not offered any mentoring to start their own business, as the BCE deemed many people incapable of succeeding in a self-employment project. The retraining opportunities offered to managers were more appealing than those proposed to pit workers. Many participants reported that they saw the BCE and other reemployment agencies as "playing the numbers game."

By the 2000s, former coal workers had become very pessimistic. They saw no real options for the future. In fact, they viewed many jobs as involving insufficient "graft" (British slang for hard work) that they could be proud of, and no policy had been put in place to attract new heavy industry. Instead, a very large number went on disability benefits, which excluded them permanently from being able to participate in programs to reenter the job market (Fieldhouse and Hollywood 1999).

This experience shows that support has to be a process that empowers workers, giving them real options in line with their personal goals and values, access to training for skills in demand, and backed by a serious industrial policy that creates new jobs.

3.5. Support for Industry

Private companies are essential partners in any Just Transition because of the need to reorient the economic activities of the region and create new sources of employment in the private sector. Broadly, support for industry in the service of regional regeneration falls into three categories. First, existing industries can get tax incentives and other government support to reduce their costs and make them more profitable in their current markets, and thereby retain jobs. This approach can be expensive—in Spain, it cost an estimated €250,000 per job saved (Caldecott et al. 2017)—because the incentives need to be maintained every year and do not address the underlying drivers behind the transition. Second, existing companies can get support for research and development, retraining, or other internal support for structural adjustment. This can lessen the burden of change on communities but requires commitment by companies to both the region and the transition. Third, financing support can be made available to new companies starting in the region. Like all new ventures, this approach carries considerable risk and requires a careful and adaptive selection of companies to help fund.

A review of business interventions developed by Scottish Enterprise, a regional development agency, between 2001 and 2006 found that the cost of additional jobs generated varied across both intervention types and particular interventions (McPherson and McDonald 2010). Interventions to support business innovation cost £7,000 to £143,000 per job created. The cost per job of supporting start-ups was much lower, £5,000 to £18,000. The wide variation suggests that the regional context and business specifics are significant factors.

We review two regionally targeted approaches to industry support in the United Kingdom: the Coalfields Funds and the Regional Growth Fund.

3.5.1. Coalfields Funds

The 1998 Coalfields Task Force found a dearth of SMEs in coalfield communities. The report showed that coal mining towns had traditionally relied on one or several large corporations (typically coal companies and heavy industry) to provide jobs; with the decline of coals, these communities lacked other businesses, as well as an investment ecosystem to foster new ones. The Coalfields Task Force saw a need for a fund that could support the growth of businesses and encourage entrepreneurship in these regions. The Coalfields Enterprise Fund (CEF, 2004–2014) and later the Coalfields Growth Fund (2009–2014) were created to address that need.

Both funds were venture capital initiatives targeted at early-stage ventures in coal regions. They provided funding in return for an ownership share in the new businesses. The Coalfields Funds also provided indirect benefits by advising applicants on business plans, suggesting other funders, and connecting them with legal and recruitment experts. Any business intending to open considerable operations within the coalfields could apply. The combined government funding for the two programs was only £25 million, but all investments were matched with private funds. This drove the funds to be highly selective, and by 2009, the CEF had invested only £8 million. One benefit of this selectivity was high returns per investment. As of 2009, the CEF had supported 26 companies and generated 482 direct jobs, with an average cost to the state per job of £16,500 (National Audit Office 2009). For comparison, the regional development agencies, the England-wide institutional structure for regional regeneration until 2010, generated 178,000 additional jobs between 2002 and 2007 at a cost of £60,000 per job. The CEF has also been effective in attracting private investment, with investments matched at an average rate of 355 percent.

However, a need remained for small loans (less than £100k) . One of the CEF's goals was to engender an entrepreneurial culture in the coalfield regions and help shift their economies away from dependence on a few large firms. This goal remains out of reach despite a 35 percent increase in businesses per capita in coalfield regions (Coalfield Regeneration Review Board 2010), where private enterprise per capita is 35 percent lower than the UK average and growth in this metric is also lower than the UK average (Beatty et al. 2019). This reflects the small scale of the Coal Funds and the large scale of the regional economic challenge. Lack of measurable objectives or evaluation of the region's specific capital needs has also undermined the programs (Chadwick et al. 2013; National Audit Office 2009).

3.5.2. Regional Growth Fund

The Regional Growth Fund (RGF), formally outlined in the 2010 report "Local Growth: Realising Every Place's Potential," was a main component of the shift toward localism (UK Department for Business, Innovation and Skills 2010). The report identified two emerging problems. First, economic growth was occurring primarily in urban centers, leaving a dearth of jobs, revenue, and investment in more sparsely populated areas. Second, the UK Government's ongoing austerity measures had caused the loss of many public sector jobs, impairing regions that had historically depended on the public sector for income and employment.

The report called for the UK Government to use its financial resources to foster businesses in places where investment had previously been lacking, essentially "rebalancing" economic growth. As part of the European Union, however, the government was restricted from supporting industry withi "state aid" that could give the United Kingdom an unfair economic advantage, with the exception of designated areas of underdevelopment.

Box 5. Assisted Areas and State Aid

It is unlawful for any EU member state (including the United Kingdom, prior to January 1, 2021) to provide companies with a competitive advantage in the European market through state aid, defined as "an advantage in any form whatsoever conferred on a selective basis to undertakings by national public authorities" (European Commission 2019). In other words, national governments cannot selectively give a leg up to companies or organizations. The prohibition is designed to maintain an even playing field for companies in the European market and prevent member states from giving their companies competitive advantages (Government of Scotland 2020).

Enforcement of the rule falls to the European Commission, which has investigative authority over member states' governments. All economic aid measures being considered must obtain prior approval. A measure that is implemented and then found to be in violation is subject to fund recovery (EC 2019).

The state aid rules contain an important exemption, however. "Regional aid" guidelines states to support small to medium-sized enterprises (SMEs) in "less economically advantaged places that would benefit from additional support for development" (UK Department for Business, Innovation and Skills 2014). In the United Kingdom, such areas are known as "assisted areas" (Figure 5) and are eligible to receive regional aid in compliance with EC rules. The Regional Growth Fund, Regional Selective Assistance, Welsh Government Business Finance, and Selective Financial Assistance programs take advantage of this designation to assist SMEs in regions where businesses are struggling to grow (UK Department for Business, Innovation and Skills 2014). Three designations of assisted areas determine the extent of aid. Coalfield communities face some of the highest barriers to SME growth in the country and thus are prominently represented among the assisted areas.

The RGF provided no-interest loans to initiatives in these areas to boost the economy and, in particular, to create and safeguard jobs. Bids are evaluated based on project location, need, job creation, value for money, and state aid compliance. The support of local enterprise partnerships as been central to the development of successful bids to the RGF (Cox et al. 2014).

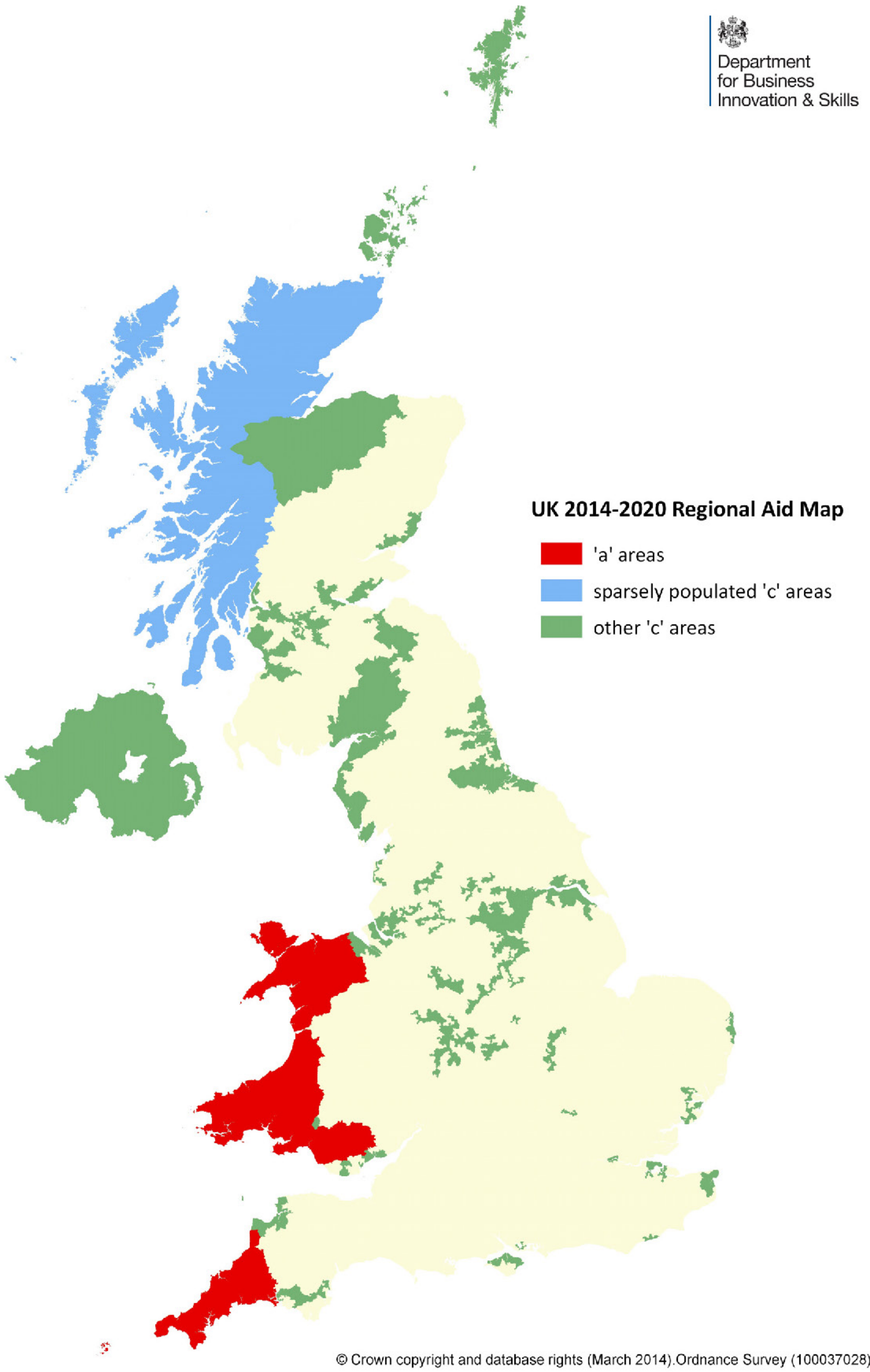
The RGF has been the most successful of the policies reviewed here at bringing in private funds. By 2014, when £2.6 billion had been committed, it was matched with £14.4 billion in private funds. It also has one of the lowest costs per job, having created or safeguarded 141,000 jobs by 2015 for £1.5 billion, an average cost of £11,000 per job (UK Government 2015).

However, this represents a very select group of projects, with demonstrated private sector buy-in and high-value propositions, said to be possible only through the support of the RGF. Total RGF investment was below desired levels because of the lack of available funds, with the result that some regions did not receive the full available support (UK Government 2015).

3.6. Support for Regions and Communities

Coal was once a core economic driver, with at least 10 percent of the male working population in coalfield regions employed in coal mining (Beatty et al. 2019). The loss of coal jobs undermined the economic foundation for a wide range of sectors, including suppliers, transportation, food services, and housing. Studying economic transitions in the United States, Acemoglu et al. (2016) find that the total effect on employment is 5.9 times the initial loss of jobs—consequences that emerge both along the supply chain

Figure 5. UK Assisted Areas



Source: Beatty et al. (2019).

network and geographically. Unlike workers in the directly affected industries, these unemployed individuals often have no way to protest the transition, and they receive no compensatory severance pay.

The resulting regional deprivation requires regional solutions. New transportation links, remediated land, and other supporting infrastructure may be needed to make the regions attractive to new economic activity. These investments provide public goods that support all economic activity. Although support for individual industries also contributes to regional regeneration, regionwide planning initiatives are also needed to discover a new economic engine to replace the one that was lost.

Four policies aimed at regenerating regions—the National Coalfields Programme, the Coalfields Regeneration Trust, the Single Regeneration Budget, and the EU Cohesion Policy—can be classified as structural adjustment assistance, but the scales at which they operate are quite different.

3.6.1. National Coalfields Programme

The National Coalfields Programme (NCP), one of the three programs targeted at the coalfields, started at the end of the 1990s, more than a decade and a half after the beginning of pit closures (the others were the Coalfields Regeneration Trust, Section 3.6.2, and the Coalfields Enterprise Fund, Section 3.5.1). The UK Government committed a total of £1.1 billion for the three programs, with the goal of reversing rampant unemployment and low attractiveness of the coalfield areas.

The objective of the NCP was to remediate abandoned and contaminated coal mining sites and develop them into housing and commercial space. It eventually addressed 107 sites across seven regions of the United Kingdom. Projects were funded by public-private partnerships, with a total public investment of £880 million and private investment exceeding £1 billion (Industrial Communities Alliance 2020). The NCP remediated some of the most highly contaminated sites in Europe, including many with poor economic potential, and with a limited public budget. The financial approach was to bring all sites under public ownership so that sites with higher economic potential could subsidize those with lower potential. The NCP would fund the remediation and partner with private investors and local developers to find a new purpose for the site. Subsequent land sales and loan and equipment payments gave the program revenue to reinvest in other sites.

The NCP eventually succeeded in remediating all abandoned coal sites. The program took 20 years—double the time originally envisioned. Many sites were redeveloped as warehouses, and the number of jobs in warehousing in former coalfield areas is now about equal to the number of coal jobs in the early 1980s (Beatty et al. 2019). One success case is the Sheffield advanced manufacturing park, a technological hub that has attracted other companies and encouraged investment in skills and innovation, thus diversifying the economy. However, the program as a whole was poorly monitored. For example, there are no records of who was recruited into new jobs, and remediation costs and redevelopment costs were lumped together. Thus it is difficult to estimate how cost-effective the program has been, and the extent to which it benefited people in the coalfields.

3.6.2. Coalfields Regeneration Trust

The Coalfields Regeneration Trust (CRT) was set up as a charity in England, Scotland, and Wales, endowed with a governmental fund, to provide social support to communities. It was mandated to provide grants to social enterprises, community service organizations, workforce development programs, and youth engagement programs in regions affected by the decline of coal. This organization was intended to be community-based, highly embedded, and responsive to community needs.

The CRT is small, with a total current full-time workforce of 40 people. In Scotland and Wales, it is funded year to year, receiving £2.5 million from each government. In England, it previously received £29.55 million every three years but is now required to be self-financing. It has established four small subsidiaries, which generate a yearly revenue of about £4 million. Over the 20 years since its founding, the CRT has received roughly £300 million in public funding in England, Scotland, and Wales, which it has disbursed in small grants (ranging from £10,000 to £300,000, with an average of £20,000) to social enterprises, community organizations, local training agencies, community-based renewable energy infrastructure, and other initiatives.

Although the CRT has a small budget, its program portfolio shows that it is versatile and nimble, responding to needs on the ground with highly tailored programs. Surveys of CRT funding recipients indicate that 97 percent of respondents considered the CRT's collaboration to have been crucial to their enterprise. In addition,the CRT helped many obtain additional funding from other sources. Stakeholders overwhelmingly consider it responsive and supportive. In contrast with the BCE (Section 3.4), its particular strengths are its flexibility to address the particular needs of local stakeholders, its provision of practical advice in line with the objectives of grant seekers, and its ability to move quickly to fill a gap in funding from other sources and keep an initiative going. It is seen by many as the most efficient grant-distributing organization, with good understanding of the field and of the sectors that need support (IWA 2011).

Auditors and observers have criticized the NCP, CRT, and CEF for not developing a joint strategy and coordinated approach, with consequent disconnects between NCP development plans and the training offered by the CRT. In many cases, sites were sold to new employers with no program in place to inform the local community and recruit ex-miners. As a result, some sites have very low occupancy rates, and at others, a majority of jobs went to people outside the coalfield areas (National Audit Office 2009).

3.6.3. Single Regeneration Budget

The Single Regeneration Budget (SRB) was one of the most extensive area-based initiatives in England. From 1993 to 2002, it broadly targeted projects that would make places more attractive for people to live and for businesses to invest in.

The SRB distributed a total of £5.7 billion to 1,028 projects over six rounds, in amounts from £500,000 to £100 million, usually for projects at neighborhood scale (Rhodes et al. 2007). The coalfields' share was on the order of 12 to 14 percent, or £600 million to £800 million. Total spending on these projects is estimated at £26 billion, with additional funding coming from local authorities, learning and skills councils, the private sector, and the European Union.

Competitive bidding became an important aspect of public policy in the mid-1990s. Instead of allocating funds based on need, competitive bidding was meant to reward innovative projects and push local actors to take responsibility to identify their own priorities. SRB recipients had to be local partnerships involving public, private, and third-sector actors. The goal was to coordinate different sectors, leverage private finance, achieve economies of scale, and build local capacity for more coordinated economic governance. However, the selection process was very centralized and opaque to local actors (Gibbons et al. 2020).

One objective was to increase local employment. End-of-program estimates were that SRB projects created at least 600,000 jobs, helped 400,000 people find jobs, and supported the start of 87,000 new businesses (Rhodes et al. 2003). That number of jobs created is in line with the more econometrically rigorous evaluation by Gibbons et al. (2020), who estimate that the 18 percent of funds dedicated to developing commercial floor space increased workplace employment by about 200,000, at a cost of about £40,000 per job. However, Gibbons et al. (2020) note that no information was collected on whether these jobs benefited residents. In fact, the projects made no difference to local employment rates—that is, the jobs did not go to the residents of the targeted area.

The SRB and other area-based initiatives may have been more successful in improving social outcomes than economic ones. Indeed, even if area-based regeneration projects do not succeed in reversing broader economic dynamics, they can do a lot to lessen the effects of poverty by ameliorating the experience of living in a deprived area—by improving housing, community safety, the physical environment, and educational opportunities (Crisp et al. 2015). End-of-program estimates suggest that as a result of SRB projects, more than 5 million pupils benefited, more than 300,000 homes were built or renovated, 34,000 acres of land were recovered for open space or development, and more than 100,000 community groups received support.

From the point of view of governance, the SRB required strong accountability from the local partners to the central government, but very little to the local community: it held few public meetings and published few accounts. It therefore does not shine as an example of successful decentralization (Hall 2000).

3.6.4. EU Cohesion Policy

The EU Cohesion Policy, a large policy framework aimed at regional economic development, has its roots in the 1970s. The policy consists of five European structural and investment funds, of which two, the European Regional Development Fund and the European Social Fund, are the most relevant in the UK context. One third of the EU budget is dedicated to this policy. The budgets are allocated for a long period—seven years. The most recent funding period was 2014–2020, with a total budget of €639 billion.

The policy is spatially targeted: the beneficiaries are regions that are either “less developed regions,” with a GDP per capita less than 75 percent of the EU average, or “transition regions,” with GDP per capita between 75 and 90 percent of the EU average. The United Kingdom had 11 transition regions and two less developed regions (Cornwall and the Isles of Scilly, and West Wales and the Valleys), out of 31 regions. Through this formula, the United Kingdom received €10.8 billion in 2014–2020, and Wales (including the Welsh coalfields) received the most funding of any UK region.

The funds are administered through a combination of top-down and bottom-up processes. The European Commission has set out general strategic objectives and guidelines, with top priorities including innovation and research, the digital agenda, support for SMEs, and the low-carbon economy. National governments then distribute the funds to the targeted regions. In England, they are distributed to local enterprise partnerships, which draft a strategy for how the funds are to be used, taking into account the EU priorities (with a great deal of flexibility). These strategic plans are then negotiated with both the national government and the European Commission. The commission also publishes guidelines for monitoring and evaluation of both individual projects and the combined results within larger programs.

Given its scale, ambition, and duration, the EU Cohesion Policy is one of the best-studied regional programs in the world, with more than 50 academic papers analyzing its effects. Evaluation is at the center of the policy design, each programming period undergoing significant reform in light of lessons learned. At the EU level there is general consensus that the net effect is to boost regional growth at least in the short term, but the effects are highly dependent on national and regional contexts (Rodríguez-Pose and Garcilazo 2015). In the United Kingdom, regions with higher proportions of EU structural funds experienced higher growth rates over 1994–2013 (Rodríguez-Pose and Garcilazo 2015). Detailed data on the use of funds has allowed researchers to study the effect of policy design on outcomes. Rodríguez-Pose and Garcilazo (2015) found that regional programs that concentrated funds in a small number of areas were far less successful, and those that neglected regional weaknesses (by focusing on comparative advantage instead) were also less successful. Ferrara et al. (2017) evaluated the causal relationship between funding and outcomes in targeted regions. They found that innovation funds clearly boosted growth in innovation (measured as patent applications per million inhabitants) and catching up with the mean level in noneligible regions. The effects of transport funds on road accessibility were also positive but much more heterogeneous.

4. Policy Outcomes and Lessons

We have reviewed several regional policies that were either fully or partially targeted at the former coalfields. It is now instructive to evaluate how the coalfields have developed since those policies were put in place.

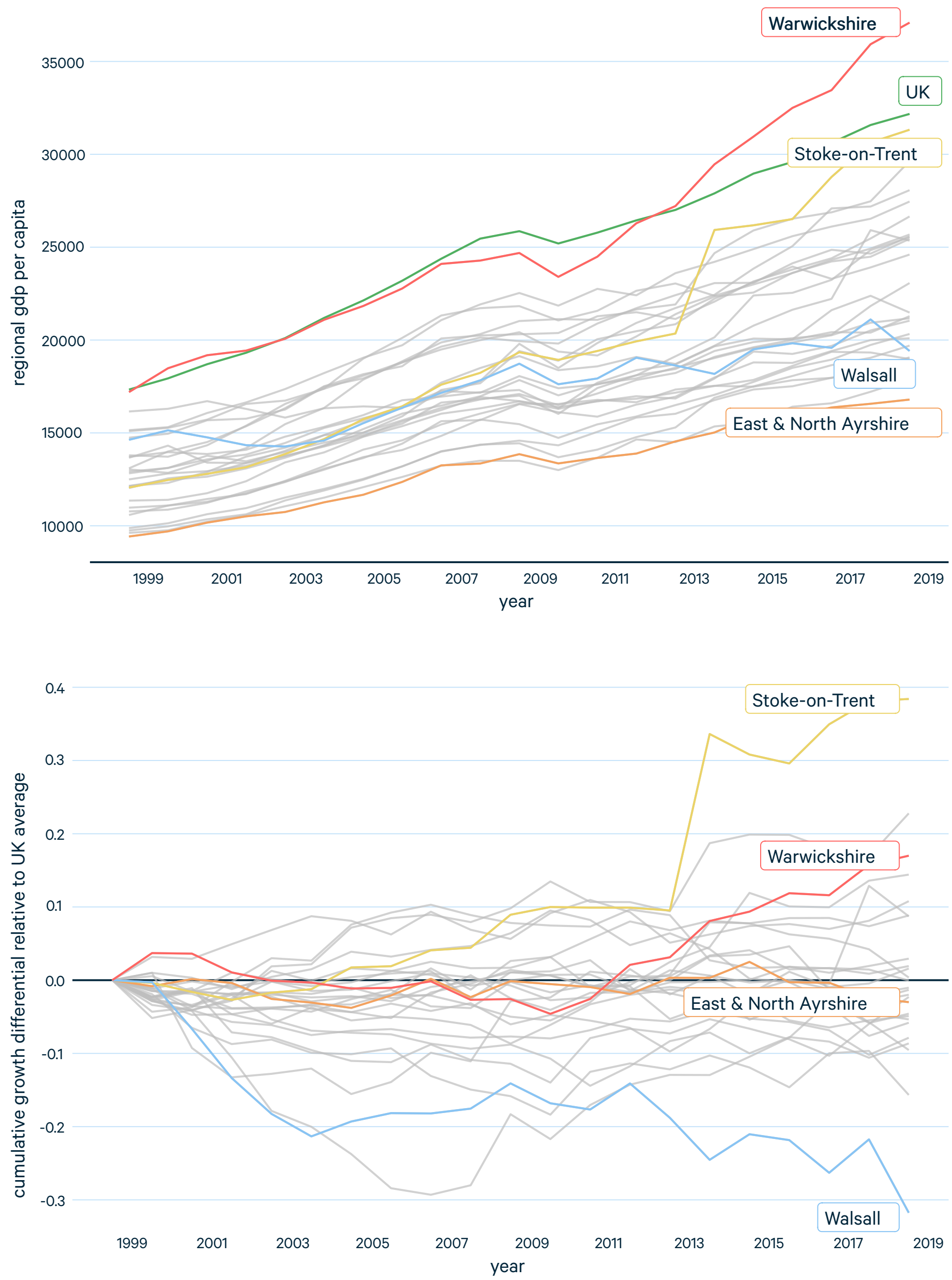
4.1. Outcomes

Figure 6 gives an overview of the varied economic fates of the coalfields since 1998. As we see in the upper panel, all coalfields except for Warwickshire started off poorer than the UK average and are today still poorer than the UK average. Thus, transition support policies have not succeeded in helping these regions converge with the national average. The lower panel provides a more nuanced view, showing that some coalfield regions have fared better than others. It depicts the cumulative difference in the growth rate of each coalfield relative to the national average. Lines above 0 indicate that a region has grown faster than the national average. Stoke-on-Trent, for example, grew 1 percent faster than the national average, putting it on a path to convergence with the average. About half of the regions are characterized by lines hovering around 0, indicating that they have grown at the same rate as the nation as a whole and therefore maintain the same relative disadvantage now as in 1998; East and North Ayrshire, a very poor region, is an example. Lines below 0 indicate growth slower than the national average, as is the case for Walsall.

Since many regeneration initiatives focused on stimulating local economic activities, we start by assessing changes in the local economies of the coalfields. The number of jobs in the coalfields stands at 55 per 100 residents of working age (falling as low as 42 in South Wales), compared with 73 for the United Kingdom on average. Warehousing has been a growth sector, now employing almost as many people as coal mining did in the early 1980s. However, the stock of businesses in the coalfields (relative to the population), as well as the business formation rate, is on average only two-thirds of the national average. Furthermore, levels of qualification are low because of selective outmigration. Even though school performance in the coalfields is in line with national averages, many coalfield residents commute out of the coalfields to work. It is estimated that the real rate of unemployment is 7.5 percent, compared with 5.7 percent on average (Beatty and Fothergill 2019).

These economic difficulties bring enduring social hardships. Average life expectancy in the coalfields is a year less than the national average, and the incidence of self-reported ill health is about 12 percent more than the national average. The proportion of working-age adults receiving disability benefits is about 50 percent more than the national average. According to Indices of Deprivation, 42 percent of neighborhoods in the coalfields fall into the 30 percent most-deprived places in England. Compounding this difficult situation, funding for the social sector and local authorities has dramatically declined since 2010 because of the government's austerity policies. Incomplete evidence suggests that the cuts have been regressive (falling more heavily on more-deprived areas), and many voluntary organizations have entirely lost their

Figure 6. Regional Trends in Economic Activity in Former Coalfield Regions



Notes: The upper panel shows regional GDP per capita (in 2018£); the lower panel shows the cumulative differential in growth rate relative to the UK average.
Source: Office for National Statistics, **https://www.ons.gov.uk/economy/grossdomesticproductgdp/bulletins/regionaleconomicactivitybygrossdomesticproductuk/1998to2018.**

government funding. Charities and nonprofits in the coalfields are much more likely than the average to report a shortfall in funding. Welfare reform (cuts in benefits) has also had a slightly regressive effect, with expected cuts of funding of as much as £800 per working-age adult per year in many districts, including former coalfields (Beatty and Fothergill 2018).

4.2. Timing of Support

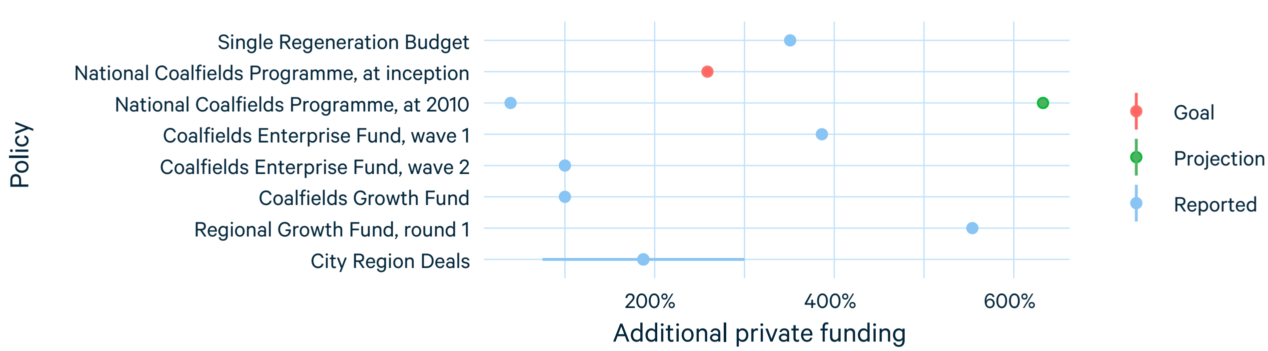
Overall, the transition policies directed at the coalfields came very late—about 15 years after pit closures. The funds were modest and were distributed through a plethora of programs, in a fairly fragmented approach. Communities have had to repeatedly bid for a variety of projects, making it difficult to build a coherent long-term strategy.

With the exception of the EU Cohesion Policy, the policies reviewed in Section 3 did not prescribe evaluation. The data on program implementation were unavailable or difficult to access, and data gathering to track outcomes was insufficient. Given the complexity of the policies and the problems they address, it is essential to learn from each policy experiment. An evaluation plan must therefore be an inherent part of policy design moving forward.

Given the lack of direct policy evaluation, the ability of these policies to attract private funds can be used as an indication of their perceived promise or success.

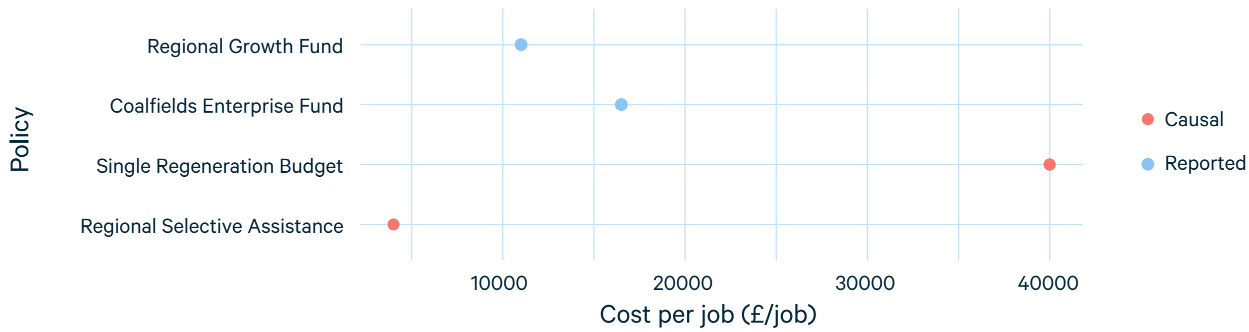
Results are summarized in Figure 7. Some policies drew very high levels of private funds, with the Single Regeneration Budget, Coalfields Enterprise Fund, and Regional Growth Fund all securing additional private funding that exceeded 300 percent of their public funds. These policies were aimed at regions and communities and at industries. We also include the City Region deals program (Section 5.1.2), which secures private funds equal to about 200 percent of its public funding.

Figure 7. Additional Private Funding for Selected Policies



Another metric for policy evaluation is the cost per job created. In Figure 8 “reported” refers to the cost per job created as stated in end-of-project reports. These are not causal estimates. We can thus expect that they are underestimates of the real cost per job truly created by the policy. We were able to include two causal estimates, one for the SRB (Gibbons et al. 2020) and one for the Regional Selective Assistance (Criscuolo et al. 2019), a program not reviewed here that was a place-based local development fund active following coal mine closures. The figure indicates that some policies apparently created jobs at a reasonable cost. However, caution is warranted: Gibbons et al. (2020) find that the jobs created by the SRB went not to local residents but to workers outside the targeted zone who commuted in. Generally, insufficient data were collected to evaluate whether transition policies truly helped the intended beneficiaries.

Figure 8. Cost per Job Created for Selected Transition Policies



4.3. Scale of Programs

Many regional policies display the following pattern: they increase jobs created or local GDP yet fail to fully reverse the decline or put the local economy on a path to catch up with the national economy. In the coalfields, regeneration has supported the development of new businesses, which have absorbed a significant part of the available workforce. Nevertheless, as was shown in Figure 6 (Section 4.1), most of these regions continue to lag. For the EU Cohesion Policy, most studies find a positive effect on growth, yet this effect is sometimes short-term or insufficient to meet the objective of regional convergence.

This pattern may be due to an insufficient scale of funding (Table 2, Section 3.3). The Ruhr region in Germany is a good example of a more ambitious and more successful policy, where €38 billion was spent over a period of 14 years to diversify and increase the attractiveness of the region. For example, 22 new universities were opened to attract companies seeking a skilled labor force and opportunities to build networks with universities and suppliers (Oei et al. 2020).

Hence, the scale of investments matters and has to be adequate given the extent of the disparities. Regional funding in the United Kingdom seems insufficient to address the scale of spatial disparities (although this is difficult to fully assess because of the fragmentation of policies and the myriad small funds).

Another way to explain the pattern of micro-success and macro-failure is that the effects of the basic economic institutions of a country may overpower the benefits of regional policies. Let us briefly consider the potential effect of public finance, education, and financial institutions as examples.

Most of central government spending is "spatially blind"—that is, it does not specifically target localities based on need (as do regional policies). Yet this spending ultimately flows to localities (individual universities, companies, schools, hospitals) and is therefore not spatially neutral. In fact, it could be "counterregional" in the sense of exacerbating regional disparities and dwarfing the effect of regional policy funds. For example, procurement policy for the defense industry is very geographically concentrated in the United Kingdom (as in the United States) and plays in important role in the local economy (Crump and Archer 1993). The implication for Just Transition policies is that the regional flows of all public funds should be evaluated in light of the transition challenge, to check for opportunities to redress historical patterns of regional inequality in public funding.

The institutions governing the provision of education are also a building block in a region's capacity to adapt. To what extent are quality schools and universities distributed across regions? In the United States, where 44 percent of public school funding comes from local sources (and 34 percent from local property taxes), access to education is extremely unequal and perpetuates inequality (Chetty and Friedman 2011). When regions suffer from a downturn or structural change, their capacity to fund schools diminishes, along with their capacity to invest in the human capital that can allow them to transition. It is hard to imagine how a regional policy can reverse the consequences flowing from the spatial inequalities built into one of the most fundamental institutions of the economy.

Although the United Kingdom's schooling system is centrally funded, higher education is marked by the famous "golden triangle" of well-endowed and well-funded universities in Cambridge, Oxford, and London. Redirecting funds to universities in other regions is a major component of the "leveling up" agenda of the government (rebalancing the economy of the rest of England relative to that of the wealthy South-East). In Germany, universities and research institutes (the Max Planck network for basic research and the Fraunhofer network for applied and engineering research) are extensively distributed across the federation and well connected with local industry. Here the implication for Just Transitions is to consider opportunities to significantly improve equality of educational resources across members of society, as a building block for more targeted policies.

Access to finance is also shaped by national-level institutions and has enabling or constraining effects on local growth (Klagge and Martin 2005). In the United Kingdom, financial organizations are heavily concentrated in the South-East and provide lending to industry and in particular small businesses. SMEs outside the South-East have difficulty raising capital. Financial policies directly affect the incentives of banks to lend to small businesses, which in turn affects a region's response to downturns (Hackney 2018). In the United States, supplementary lending by the Small Business Administration can support regional transitions. Similarly, KfW in Germany helps ensure more regional evenness in the allocation of funding to SMEs. When these institutions are lacking, as in the United Kingdom, policymakers try to fill the gap with loan funds, but this seems less effective than building an institution that can provide reliable, professional, long-term service.

Those examples show that the capacity of regions to adapt to structural change is shaped by national-level economic institutions and policies whose effect may far outweigh regional policies.

4.4. Lessons from UK Transition Policies

The policy analyses and the evaluation literature allow us to extract some best practices and recommendations for the types of policies reviewed in this report. To strengthen our confidence in such recommendations, future policies must allow for ex post evaluation by having clear objectives, detailed metrics, and open data.

4.4.1. Support for Workers

- Training provisions need to empower people rather than seek to slot them in positions based on a priori conceptions of their potential, as did the training programs for ex-coal miners in the mid-1980s and 1990s (Murray et al. 2005).
- Reliance on welfare policies (early retirement, unemployment, and disability payments) does not give workers the tools they need to develop new economic activity.

4.4.2. Support for Enterprises

- Supporting businesses through loans or cash in exchange for equity has been successful in the case of the Coalfields Funds, which cost-effectively generated jobs and allowed new businesses to become self-sustaining.
- Tax incentives to attract businesses can be very costly, since they do not address the root causes of the regional challenges (Caldecott et al. 2017).
- In some regions, the pool of worthy projects for enterprise funds is small because entrepreneurial culture is weak. This can be remedied by complementary investment in skills and enterprise grants sustained over a long period.
- Businesses in proximate industries are more likely to be a good fit for the region and remain because they can draw on the region's existing skill set and networks of suppliers. Enlarging businesses' local networks by supporting partnerships with universities and research centers can help form a cluster that strengthens local industry (Oei et al. 2020).

4.4.3. Support for Regions

- As illustrated by the EU Cohesion Policy, public funding for regional economic development should address all the binding constraints of a region (weaknesses such as transport infrastructure, R&D, human resources, business investment, tourism, and entrepreneurial culture). In contrast, concentrated investment and investment in areas of strength do not generate the same level of returns (Di Cataldo and Monastiriotis 2018).
- Transport links increase flexibility in how a community adapts, but not all communities enjoy strong links—as illustrated by the diversity of economic outcomes across the different coalfields (Gore et al. 2007).
- Supporting community cohesion and the development of soft skills in the community, as does the Coalfields Regeneration Trust, helps people win grants and speak the language of bureaucrats and employers.
- Specific policies are needed to address the problems of those suffering from acute deprivation. Local economic development policies, even when effective at stimulating local growth, do not automatically lead to a reduction in poverty, partly because poverty reduction involves a different set of policy actors with different interests and expertise.
- Typical regional growth funds (e.g., EU Cohesion Policy) do not show decreasing returns. This means there is scope for increasing funding for local economic development policy to reverse very high levels of regional inequality.
- To promote local growth, programs need to define targeted objectives, have a long horizon, and combine bottom-up and top-down planning. One-off programs (a common policy design in the United Kingdom) are hard to coordinate with and to evaluate.
- Local economic growth requires coordination between many stakeholders (to align infrastructure needs, business support, skill development). Policies should build processes for coordination at multiple scales, experimentation at multiple scales, and on-going stakeholder engagement (Crescenzi and Giua 2016).
- Building pre- and post-evaluation plans into policies is crucial for informing policy design. Having clear targets and metrics, as well as reporting responsibilities and accessible records, allows policies to be evaluated and funding to be directed to the greatest-value projects.
- Metrics should be useful. The deprivation index and maps of transition regions (in this case, coalfields) have helped target effort. The number of jobs directly created by a policy can be compared with changes in the total joblessness rate. When acres are remediated and returned to productive use, the resulting growth in industrial space and its new uses can be tracked. The ability of public policy to attract matching private funds is also a marker of success, as determined by the market.

4.5. Comprehensive Planning

One insight from the decline of coal economy in the United Kingdom is that mining job losses have ripple effects on the rest of the labor market. Miners themselves were often able to find employment until retirement, obtain early retirement, or receive severance payments. However, without a corresponding expansion of other work, women in manufacturing and workers in other sectors, supporting industries, and the wider community saw losses of work and income (Aragón et al. 2018). These losses can last generations as weaknesses in earnings, qualifications, and occupational mix reproduce themselves over time (Beatty and Fothergill 2020).

The United Kingdom has painfully learned from experience that narrow compensation policies, such as severance pay and disability benefits, foster a culture of joblessness that contributes to an area's long-term deprivation. These policies do not prepare the workers for new jobs or help create new jobs, so their opportunity cost to the economy is considerable. Thus, Just Transition policies should actively support the growth of new industries and qualifications instead of merely compensating redundant workers.

The UK coal transition has also shown that renewal of infrastructure is a vital but insufficient ingredient for adaptation to disruption. Coalfields have been reclaimed, albeit slowly, and are now used for housing, warehousing, business floorspace, or wildlife refuges. Transport infrastructure is also critical, and often underestimated, for giving people access to labor markets and options for adaptation. Indeed, the less connected coalfields have generally fared worse over the subsequent decades (Gore et al. 2007). Nonetheless, infrastructure alone will not revitalize a region. The structural sources of poverty need to be considered comprehensively. This is more likely to happen if affected areas organize and advocate for themselves, as did the UK coalfields by forming the Coalfield Communities Campaign (now the Industrial Communities Campaign). These advocates played an essential role in verifying that central policies responded to their needs.

Despite the eventual development of more comprehensive regeneration policies, many coalfields have continued to struggle. This experience shows that it is very difficult for a regional economy to catch up, once it has fallen behind. Regeneration policies are fighting against a dynamic process in which young people, jobs, and entrepreneurial culture have started gravitating elsewhere and social networks, as well as human capital and health, have weakened. Thus, advance planning in regions exposed to transition risk is extremely important.

Advance planning is particularly important for protecting workers' rights. As jobs are lost in a labor market, the bargaining rights of workers weaken, and so do wages and workplace conditions. To avoid this, industrial policy can be leveraged to stimulate the creation of new jobs before old jobs are lost, and labor standards, such as a right to access skills qualifications (which does not exist in the United Kingdom) would help empower workers.

Long-term planning can make a significant difference in the outcomes of Just Transition interventions. Coal regions in the United Kingdom and elsewhere have taken generations to transition, and the most effective policies (e.g., EU Cohesion Policy) have operated on long time horizons (Caldecott et al. 2017). Transitions involve restructuring the drivers of an economy, including rebalancing the complex network of supporting industries and trade relationships. Workers need to train and to find ways to redirect their years of experience. As a result, proactive policymaking—preparing for transitions long before any jobs are lost—is essential. With this additional time, communities can be engaged to understand their choices and plan a shared future, rather than being powerless in an abrupt, uncontrolled change.

Having learned the lessons the hard way, UK policymakers and stakeholders are now developing new policies and initiatives for future transitions. Section 5 describes these policies and the associated advance planning.

5. Energy Transition Today

The United Kingdom is undergoing technological, economic, geopolitical, and lifestyle transitions at a time when it must also transition away from a carbon-intensive economy. The UK Climate Change Act (Section 2.3) is the centerpiece of the policy and planning process for reaching net-zero, with regular reports that cover sectoral impacts, costs, and near-term and long-term goals.

The transition to a net-zero carbon economy will cause multiple types of occupational shifts, some of which will create new clusters of job loss, which is what concerns us here. Over coming decades, job losses are expected in the North Sea from a reduction in the oil and gas sector, which employs 30,600 workers and is estimated to indirectly support about 260,000 workers (OGUK 2019). Fluctuations in the price of oil and gas over recent years have already affected the North Sea industry, which has relatively high costs of production compared with other oil- and gas-producing areas. Other clusters of job loss could arise from shifts away from livestock farming and internal combustion engine manufacturing.

These shifts are relatively small compared with the scale of net-zero employment shifts in other countries. Yet, in the United Kingdom as elsewhere, they play out in the context of other job transitions and need to be considered conjointly with those other trends. First, adjustment to a post-Covid, post-Brexit context will have long-term economic costs (Bourquin et al. 2020). Second, automation is slowly but deeply transforming occupational profiles and occupational demand. PWC (2018) anticipates that automation could affect up to 30 percent of UK jobs by the early 2030s, jobs mostly held by those already more exposed to economic insecurity (e.g., people with lower qualifications and in low-skilled positions). Meanwhile, skill-shortage vacancies—openings that employers have difficulty filling because applicants lack relevant skills, qualifications, or experience—accounted for 22 percent of all vacancies in the United Kingdom in 2019–2020,[8] with a large proportion involving STEM skills (Prospects and HECSU 2020). This indicates there is still progress to be made in expanding the availability of skills needed by the economy for the digital and net-zero transition.

The history of policymaking to address challenges in the former coal regions—beginning with market-based solutions, then addressing region-wide issues, and finally witnessing the rise of localism policies—offers important lessons for the broader Just Transition. We can learn from past failures and develop new planning processes that engage with all relevant stakeholders and thereby have a better chance of ensuring equity and success.

The new, proactive planning processes fall under the “comprehensive adaptive support” classification from Green and Gambhir (2020)—approaches that have the “greatest potential for just, equitable and smooth transition outcomes, but are

8 Although these were reported across 163 professional occupations, sectors with the highest skills shortages for graduates included nursing, programmers and software development professionals, and human resources and industrial relations officers.

costlier and more complex to implement." The complexity comes from the demands to integrate the needs of many actors, plan comprehensively for the future, and develop clear statutory goals while maintaining adaptive flexibility.

In this section, we look at three partial models for more integrated approaches. Although these policies do not achieve all of the aspects needed to ensure a Just Transition, each highlights a particular aspect. Unlike most of the policies reviewed thus far, which tend to be more fragmented and piecemeal, these new policies attempt to plan for a Just Transition by providing a long-term pathway and encouraging coordination among actors.

5.1. Current Policies to Support Workers – A Sampling

5.1.1. Skills Development Scotland

The proactive and accessible services of Skills Development Scotland (SDS) stand in contrast to the poor performance of retraining programs in past coal transitions. SDS is a centralized public agency for employment and workforce development, created in April 2008 by merging existing skills- and employment-related programs. It is organized as a limited liability company whose board members are appointed by Scottish ministers to represent a variety of backgrounds in the public and private sectors. SDS receives overall guidance from ministers but otherwise operates independently from the Scottish Government with a budget of about £230 million per year, or around £42 per year per capita (Government of Scotland 2021).

SDS's structure is worth highlighting as relevant to Just Transitions. First, SDS offers a wide range of services to support individuals facing redundancy. It also has several programs that facilitate access to employment: Scottish Apprenticeships, for training in industry-specific skills, and programs to support those with a more uncertain path to employment (e.g., Employability Fund, Introduction to Work Place Skills, National Third Sector Fund). Finally, Skills Planning aims to anticipate skills demand, adjust training programs, and offer career guidance.

Within SDS, the Partnership Action for Continuing Employment (PACE) serves as a consolidated package of redundancy services, including help understanding tax responsibilities, writing CVs and cover letters, coping with stress, and accessing unemployment benefits, plus career management workshops, information about training and funding sources, and help with numeracy and literacy. PACE is evaluated via a biennial survey that asks clients to assess the usefulness of its services. Data indicate that PACE is successful. As many as 40 percent of people facing redundancies use PACE. Of these, 25 percent underwent training and 80 percent had found employment within a year. Nearly half believe that the services influenced their employment outcome (PACE 2020).

SDS is also notable for its embeddedness within the Scottish economy. It maintains at least 30 "High Street" SDS centers in cities and towns, which serve as one-stop-shops for all career services, including direct access to one of the 18 PACE local teams throughout Scotland. SDS delivers its services in collaboration with other organizations (local governments, universities, Scottish Enterprises, Sector Skills Councils, Industry Advisory Boards, Community Planning Partnerships, the UK Commission for Employment and Skills) to avoid duplication and ensure a coordinated approach. Collaboration with industry is close as well. For example, new apprenticeships are provided based on the advice of the Scottish Apprenticeship Advisory Board, after approval by the Apprenticeship Approval Group, a separate employer-led group that meets monthly to discuss new apprenticeships (Hyslop 2009).

This socioeconomic embeddedness is also reflected by the regional specificity of SDS's services. For example, SDS regularly publishes regional skills assessments of demand, supply, and mismatches. This approach has enabled SDS to quickly work with local Growth deal partners (Section 5.1.2) to adapt government services to respond to Covid-19 labor market disruptions, in particular via the National Transition Training Fund, which aims to help people acquire skills for the net-zero transition during the pandemic. As another example, ahead of the closure of a factory, a task force typically forms to plan ahead: SDS works with unions, the city council, and Scottish Enterprises (an agency supporting businesses) to identify new business and employment opportunities to ease the transition.

5.2. Current Policies to Facilitate Integrated Planning – A Sampling

5.2.1. City Region and Growth Deals

The emergence of City Region and Growth Deals is rapidly reshaping the relationship between national and local governments. City Region deals are "bespoke packages of funding and decision-making powers negotiated between central government and local authorities and/or local enterprise partnerships and other local bodies" (Ward 2020). These additional powers include the ability to decide on the spending of public funds and support business and economic growth. The transition from regional development to the city-region focus reflects a movement in UK governance to site decisionmaking power at the local level (Wills 2016) while reducing the cost of local governance (Pugalis and Townsend 2012).

Box 6. Local Enterprise Partnerships

Local enterprise partnerships (LEPs) epitomize the policy reversal that occurred after the new Coalition government came into power. Prior to this shift, regional development agencies projected central government authority and facilitated implementation of programs and disbursement of funds in the regions. They were dissolved, and in their stead, the government invited local authorities and businesses to submit bids to form new bottom-up partnerships. To receive approval, the proposed local enterprise partnership had to gain support from businesses and local governments, represent a "natural economic geographic zone," and offer a vision for economic development.

LEPs are nonstatutory bodies: neither their role nor their structure is defined in legislation. Ideally, the boards consist of representatives from businesses, local governments, educational institutions, and social enterprises. Their role is to advocate for local economic interests while coordinating the vision and projects for local economic development: outlining regional investment priorities, coordinating proposals for accessing funds, providing unemployment services, weighing in on national planning policies and local business regulation.

Created after the 2008 financial crisis and the turn to austerity, LEPs were initially expected to be self-funded. Now, their operational expenses are largely government funded. LEPs are the central coordinating institution for several regional schemes: they channel EU structural funds, they can bid for the Regional Growth Fund and the Local Growth Fund (the successor to the SRB), and they are core parties in City Region deals.

In their early phase, with very limited resources, LEPs had no choice but to forge relationships and negotiate their role with existing actors. They had to take the lead in coordinating local actors and establishing links to the central government. Some LEPs pulled ahead and built capacity, taking advantage of the flexibility of this bottom-up process; others did not. A problematic aspect of LEPs is that they have no clear channel of accountability.

Across multiple funding rounds, regions were invited to submit proposals for their future economic transition. Selected bids engaged in negotiation with municipal, national, and UK-wide governments through a process that also involved private industry and civil society. Across the first two waves of funding in England and the first waves of funding in Scotland, Wales, and Northern Ireland, £7.5 billion has been committed from the UK-wide and national governments over the next 30 years.

The goals of the deals vary widely, with additional specific directions at the subcity level, but cover workers, industry, and regions. Growth deals have been used to support job training through the establishment of local skills building, workforce development, and apprenticeship programs. They have supported industries with local venture capital funds and broadband technology diffusion. They have included provisions for new housing development and low-carbon infrastructure development to regenerate economically depressed areas.

Assessing the City Region deals is a challenge (Jones et al. 2017). Accountability is unclear, with responsibility resting completely with neither the local nor the central government (House of Commons Committee of Public Accounts 2016). This lack of clear responsibility opens the door to conflicts between local and national authorities and creates potential for the national government to "slough off its various crises" onto the cities.

5.2.2. Scotland: Just Transition Commission

The Just Transition Commission (JTC), an initiative of the Scottish Government, aims to engage academia, government, labor unions, and firms to think through the challenges of transitioning to a low-carbon economy. The Scottish Parliament created the commission when it passed the Climate Change Bill in September 2018, a wide-ranging and ambitious policy that, among other things, sets a legally binding net-zero greenhouse gas emissions target for 2045. The bill also requires that the Scottish Government, in meeting this target, take Just Transition principles into account: the implementation plan for meeting the emissions targets must support sustainable jobs, support low-carbon infrastructure, incorporate worker-focused NGO recommendations, create fair and high-value work, and address inequality and poverty (Scottish Parliament 2019).

The JTC was tasked with advising the Scottish ministers on how to apply the International Labour Organization's Just Transition principles to its climate change planning. It was directed to operate for two years. During this time, it would gather evidence on Scotland's Just Transition and engage with stakeholders, including workers, community leaders, industry leaders, businesses, and NGOs. It was specifically asked to focus on how a Just Transition could support young people entering the labor market (JTC 2020).

The principles embodied by the JTC reinforce existing informal practices of stakeholder-based local planning in Scotland. Two recent examples are the Tullis Russell–Fife Taskforce and the Longannet Taskforce. The Tullis Russell–Fife Taskforce was instituted to prepare for the closure of a paper mill. Engaging with workers and local industry, the task force performed an extensive skills audit to determine how to match up workers and employers, allowing workers to market their skills in new sectors (Courier and Advertiser 2016). The Longannet Taskforce was created to plan for the closure of Scotland's last coal-fired power plant. The process took 3.5 years, highlighting the need for long-term planning,[9] but 99 percent of the plant's interested workers found new jobs. The Longannet Taskforce also held two supply-chain events for stakeholders to discuss plans, which may explain why very few of the 185 companies in the supply chain reported problems.

The recommendations of the JTC's first interim report were the result of a year-long collaborative process that involved a range of stakeholders.[10] In the process, the JTC has emerged as a new space where the energy industry, trade unions, and environmental organizations can interact (Mercier 2020). However, the scope of the JTC falls far short of its original proposal by the Just Transition Partnership: the commission was a short-term body with no statutory basis, rather than a long-term oversight organization with associated green investment funding.

9 Personal communication, Andrew Sim, Lead Officer, Local Development Plan, Fife Council.

10 Personal communication, Gregor Auld, Scottish Government, 30/09/2020.

5.2.3. Wales: Well-Being of Future Generations

The Well-Being of Future Generations Act of 2015 is a comprehensive legislative approach to strengthening action on sustainable development in Wales. A consultation process ("The Wales We Want" campaign) gathered input from almost 7,000 Welsh citizens and groups, and in response, ministers shifted the focus of the bill toward human well-being. It includes the establishment of the world's first statutory, independent Commissioner for Future Generations, whose role is to ensure that future generations are able to meet their needs.

The act outlines seven goals for sustainable development, including a sustainably growing economy that provides gainful employment to all who seek it, healthy ecosystems that are able to withstand economic growth and climate change, improved mental and physical well-being, greater equality, and more cohesive communities. The act has an unusually wide scope: it links many areas of social well-being and justice, including future generations, equality, employment, community cohesiveness, cultural identity, and global responsibility. It also imposes a clear statutory process by which the Welsh Government must anticipate and plan for future transitions, focusing on fairness and quality of life.

The act requires public bodies to pursue the economic, social, environmental, and cultural well-being of Wales in a way that accords with the sustainable development principle (Wales National Assembly 2015). All Welsh public bodies must set regular well-being objectives that promote the act's goals and evaluate new policies and resource uses for their effect on future generations' well-being. The Welsh National Assembly is required to publish an annual "Well-Being Report" assessing progress on well-being indicators, as well as an annual "Future Trends Report" predicting shifts in the economic, social, cultural, and environmental well-being of Wales. The Welsh auditor general may examine public bodies' compliance in pursuing sustainable development.

The Commissioner for Future Generations oversees planning, reporting, and coordination among the government bodies covered under the act (Wales National Assembly 2015). This includes a responsibility to advocate on behalf of future generations, assist government bodies with sustainable development, review public bodies' success in promoting sustainable development, and facilitate collaboration between public bodies to achieve sustainable development goals.

5.2.4. Wales: Prosperity for All

"Prosperity for All: A Low Carbon Wales," 2019, lays out the plans for Wales to meet its 2016–2020 carbon budget and 2020 interim emissions target, as well as to set it up for success in its 2021–2025 carbon budget (Welsh Government 2019). The plan presents a cross-sectoral strategy for transitioning to a low-carbon economy, with 76 policies and 24 program proposals. The policies are organized by sector and cover power, buildings, transport, industry, land use, agriculture, waste management, and fluorinated gases. Each sector's policies are paired with or incorporate measures to advance welfare and equity in the economic transition (Welsh Government 2019).

The plan was developed in accordance with the guidance of the Well-Being of Future Generations Act, with a focus on integration and problem prevention. In constructing the plan, ministers took a collaborative approach: working with the Commissioner for Future Generations, convening the Ministerial Task and Finish Group to make strategic decisions regarding cross-sectoral work, and soliciting public input. They also developed a well-being matrix tool to assess how the policies interact with the goals set out in the 2015 act (Welsh Government 2019).

The implementation of the plan falls to government ministries. Some policies, like power sector reforms and land use regulations, fall clearly under a specific purview; others lend themselves to cross-departmental collaboration. The Programme Board set up in advance of the plan's publication is charged with coordinating across governmental agencies (Welsh Government 2019).

Prosperity for All includes policies that support Just Transitions. One is the creation of a "climate just advisory group" to study how government policies affect vulnerable communities and communities that rely on carbon-intensive industries. The group will comprise representatives of heavy industries and citizen groups and advise the Welsh Government on delivering employment opportunities and tackling inequalities in the process of decarbonization. Other notable policies include three regional partnerships that will review decarbonization-related workforce skills gaps in their regions and provide retraining services; and the development of incentives to prevent price-sensitive businesses from offshoring their operations.

5.3. Preliminary Assessment of New Approaches

The lessons from past industrial and coal transitions have borne fruit. New approaches, particularly in Scotland and Wales, are more comprehensive and proactive. Here we offer interim assessments.

5.3.1. Support for Workers

Skills Development Scotland offers a clear improvement over the British Coal Enterprise: stakeholders are happy with its model. It offers all services related to skills development in a unified agency that is well coordinated with business associations, educational institutions, and policymakers. At the same time, it is locally embedded, with a presence in all towns. Its one-stop-shop experience for prospective users makes information on skills demand, training supply, and returns to training widely accessible.

The institutions have also become more proactive. Skill audits, used to plan for localized disruptions, aim to match workers who will soon need new jobs with opportunities in new sectors and industries. These efforts are considered effective when planning for a closure: few workers are left without a clear next step after a multistakeholder engagement processes with skill audits at their center.

5.3.2. Integrated Planning Strategies

The new policies aim at integrated planning for a Just Transition. A defining feature of integrated planning policies is that they seek to align all relevant policy domains in a coordinated way. For example, Prosperity for All (Wales) is a cross-sectoral plan with in-built processes to coordinate across multiple agencies. It features a Just Transition advisory group to systematically examine how proposed policies affect more vulnerable groups. Similarly, the Just Transition Commission (Scotland) engages with the finance industry and the Scottish Investment Bank to coordinate financial policy with the goals of a net-zero Just Transition.

A shared vision for the future is used to develop integrated policies. For example, the Well-Being for Future Generations Act (Wales) was developed after extensive citizen consultation to set broad objectives for the nation, linking future generations, equality, community cohesiveness, cultural identity, ecosystem health, and employment in the same governance structure. It guides reporting by public bodies and the development of subsequent policies. This act created an institutional framework that coordinated work among ministries in developing Prosperity for All.

Integrated policies should draw on existing experience and multistakeholder engagement processes, and involve underrepresented groups (as in the case of the Just Transition Commission and the Well-Being act). In particular, Scotland's Just Transition Commission emerged from government-community-industry planning processes going back many years, and the multilevel City Region deals being developed across the United Kingdom appear to take for granted a high level of local government-industry cooperation and negotiation.

Integrated policies need to develop through a polycentric policy process that strikes a balance between local specificity and national competence and responsibility. For example, the City Region deals are intentionally bespoke and unique, to allow them to be tailored to a particular region's strengths. However, this uniqueness makes it difficult to construct a common evaluation process and to draw clear lines of responsibility and accountability. Self-determination can even reinforce local disparities. A wider perspective is needed to specifically target inequality while marshalling external resources and achieving a level of systematization that supports inter-regional comparisons.

Planning for even small disruptions, such as the closing of a single plant, may require years of discussion and evaluation. The transition of the entire coal or oil sector needs a longer timetable. Some of the most successful coal transitions are based on planning processes that began 20 years in advance (Caldecott et al. 2017).

An important component of integrated policies is to prepare youth for the future economy. That challenge is made easier with advance planning and by coordinating with educational and skills development policy.

6. Conclusion

The United Kingdom has acquired considerable experience over the past four decades in confronting the aftermath of the decline of the coal industry. This experience has been accumulated through multiple generations of experiments with regional development, both successes and failures. Significant economic disparities remain, and no comprehensive policy has been implemented to address them.

The United Kingdom's targeted transitional assistance policies are necessary but insufficient to ensure a Just Transition to net-zero carbon economy, for two reasons. First, these policies ignore the procedural aspect of justice. Given the scale of the required transformation and the many choices we face in bringing it about, a Just Transition requires serious and ongoing social consultation via multistakeholder negotiation and citizen assemblies; it cannot be driven by experts with a playbook of best practices. Second, transitional policies supporting workers and regions will fail if they run counter to the macro policies and institutions of the economy. Labor market policies affecting the bargaining power of workers, industrial policies affecting long-term investments in new technologies, financial institutions affecting long-term investments in low-carbon infrastructure, educational policies affecting long-term investments in human capital: all have a critical role to play and condition the success of more regionally based policies.

Several lessons and practices emerge that are relevant to US policymakers. Section 4 has presented our insights in detail, but in concluding, we highlight three ideas.

First, compensatory policies are insufficient. The effects of energy transitions on local economies are far-reaching and long-lasting, and welfare policies that compensate the directly affected workers do not address the ripple effects of local structural change. Instead, comprehensive policies tailored to a region's needs are required to discover a new engine of growth and empower workers at different stages of their careers, including youth, to embrace new forms of economic activity.

Second, regeneration policies can be cost-effective but are often limited in their ability to turn around a region. Although the United Kingdom's historical policy playbook has been centered on regeneration, evidence indicates that these policies are usually reactive: they begin after a dynamic of joblessness and the outmigration of skills, entrepreneurship, and investments have already set in. These policies are also often fragmented. They are more successful when they are more comprehensive and more long-term, as is the case with the EU Cohesion Policy.

Third, the recent participatory planning policies that attempt a more holistic approach to prepare for transitions show promise. The Just Transition Commission and the Well-Being of Future Generations Act are particularly innovative and could be emulated elsewhere. However, the Achilles' heel for many regional development policy initiatives in the United Kingdom is the scale of funding and continuity in the process.

Climate change policy will create new kinds of disruption, requiring new kinds of policies. Mitigation policy will simultaneously affect dozens of sectors and industries around the globe. Fossil fuels have been a foundation of economic growth for centuries, and decoupling growth from fuel consumption will bring a range of society-wide principles into question. It will also be politically precarious, since the immediate cause of disruption will be the intentional creation of the policies themselves. Without clear action to support the affected groups, a shared commitment to make the necessary societal changes to combat climate change will be unlikely.

To garner public support, Just Transition policies need to be seen as effective and attractive to the main political coalitions. In the United Kingdom, transition and regional development policies have been pursued by both Labour and Conservative governments, and different mixes of ideology have been explored through a long history of experimentation with coalfields remediation, regional revitalization, and collaborative decisionmaking. Unlike much of continental Europe, in the United Kingdom, industry engagement has long been at the heart of regional development policy.

Our review of past and current UK policies has begun to yield a vision for effective Just Transition policy. Such policy needs to be proactive, built on deep engagement, and feature layers of coordination and monitoring. It must address the needs of workers, firms, and communities, with different but integrated policies for each group. It must be part of a campaign to develop a shared vision for the future, while developing a sense of urgency for an economywide transition. It will require community engagement on a massive scale.

Finally, Just Transition policy needs to be based on learning from past mistakes. As regions across the globe struggle with the transition and develop new policies, their experiences need to be collected and evaluated. Given the long history of expensive and unsuccessful strategies, research is needed on what kinds of approaches are cost-effective. Such research will need to combine economics, political economy, sociology, and other fields to construct comprehensive understandings of how policies interact with communities and with each other. This report is part of a project that aims to contribute to this sharing of best practices, to ensure effective policies for the vast disruptions of the next generation.

7. References

Acemoglu, D., U. Akcigit, and W. Kerr. 2016. Networks and the Macroeconomy: An Empirical Exploration. *NBER Macroeconomics Annual* 30(1): 273–335.

Alkire, S., and J. Foster. 2011. Counting and Multidimensional Poverty Measurement. *Journal of Public Economics* 95(7–8): 476–87.

Aragón, F. M., J. Pablo Rud, and G. Toews. 2018. Resource Shocks, Employment, and Gender: Evidence from the Collapse of the UK Coal Industry. *Labour Economics* 52: 54–67.

Audit Scotland. 2020. Scotland's City Region and Growth Deals. Available at https://www.audit-scotland.gov.uk/report/scotlands-city-region-and-growth-deals

Beatty, C., and S. Fothergill. 1996. Labour Market Adjustment in Areas of Chronic Industrial Decline: The Case of the UK Coalfields. *Regional Studies* 30(7): 627–40.

Beatty, C., and S. Fothergill. 2018. Welfare Reform in the United Kingdom 2010–16: Expectations, Outcomes, and Local Impacts. *Social Policy & Administration* 52(5): 950–68.

Beatty, C., and S. Fothergill. 2019. *Local productivity: the real differences across UK cities and regions*. Sheffield Hallam University.

Beatty, C. and Fothergill, S., 2020. Recovery or stagnation?: Britain's older industrial towns since the recession. *Regional Studies*, 54(9), pp.1238-1249.

Beatty, C., S. Fothergill, and A. Gore. 2019. *The State of the Coalfields 2019: Economic and Social Conditions in the Former Coalfields of England, Scotland and Wales*. Sheffield Hallam University.

Beatty, C., S. Fothergill, and R. Powell. 2007. Twenty Years On: Has the Economy of the UK Coalfields Recovered? *Environment and Planning* A 39(7): 1654–75.

———. 2020. The Long Shadow of Job Loss: Britain's Older Industrial Towns in the 21st Century. *Frontiers in Sociology—Work, Employment and Organizations* 5: 54.

BlueGreen Alliance. 2015. COP21: Statement of Principles. https://www.bluegreenalliance.org/resources/cop21-statement-of-principles/.

Bonoli, G., 2013. *The origins of active social policy: Labour market and childcare policies in a comparative perspective*. Oxford University Press.

Bourquin, P., et al. 2020. IFS Green Budget 2020. https://www.ifs.org.uk/publications/15074 (March 5, 2021).

Caldecott, B., O. Sartor, and T. Spencer. 2017. Lessons from Previous 'Coal Transitions' High-Level Summary for Decision-Makers. IDDRI and Climate Strategies.

Criscuolo, C., Martin, R., Overman, H. G., & Van Reenen, J. (2019). Some causal effects of an industrial policy. *American Economic Review*, 109(1), 48-85.

Chadwick, M., P. Tyler, and C. Warnock. 2013. How to Raise the Bar on Impact Evaluation: Challenges for the Evaluation of Local Enterprise Partnerships and the Regional Growth Fund in Times of Austerity. *Local Economy* 28(7–8): 842–51.

Chetty, R., and J. N. Friedman. 2011. Does Local Tax Financing of Public Schools Perpetuate Inequality? *National Tax Association Proceedings*, 103rd Annual Conference on Taxation, 112–18.

Coalfield Regeneration Review Board. 2010. A Review of Coalfields Regeneration. Department for Communities and Local Government, https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/6295/1728082.pdf.

Courier and Advertiser (Angus and Dundee). 2016. How Will You Help Revive Fife's Manufacturing Sector and Increase the Job Prospects of Those Struggling to Find Work after High-Profile Closures? April 26.

Cox, E., A. Broadbridge, and L. Raikes. 2014. *Building Economic Resilience? An Analysis of Local Economic Partnerships' Plans*. Institute for Public Policy Research North, Newcastle Upon Tyne.

Crescenzi, R., and M. Giua. 2016. The EU Cohesion Policy in Context: Does a Bottom-Up Approach Work in All Regions? *Environment and Planning A: Economy and Space* 48(11): 2340–57.

CREW. 2012. Regeneration in the UK: An Analysis of the Evolution of Regeneration Policy. Regeneration Wales, Adfywio Cymru.

Crisp, R., S. Pearson, and T. Gore. 2015. Rethinking the Impact of Regeneration on Poverty: A (Partial) Defence of a 'Failed'Policy. *Journal of Poverty and Social Justice* 23(3): 167–87.

Crump, J. R., and J. C. Archer. 1993. Spatial and Temporal Variability in the Geography of American Defense Outlays. *Political Geography* 12(1): 38–63.

Di Cataldo, M., and V. Monastiriotis. 2018. Regional Needs, Regional Targeting and Regional Growth: An Assessment of EU Cohesion Policy in UK Regions. *Regional Studies* 54(1): 35–47.

English Partnerships. 2008. *Additionality Guide: A Standard Apaproach to Assessing the Additional Impact of Interventions.,* 3rd ed. National Regeneration Agency, London.

EC (European Commission). 2019. What Is State Aid? https://ec.europa.eu/competition/state_aid/overview/index_en.html (October 8, 2020).

European Committee of the Regions, p. 11United Kingdom Fiscal Powers, https://portal.cor.europa.eu/divisionpowers/Pages/UK-Fiscal-Powers.aspx

Fankhauser, S., A. Averchenkova, and J. Finnegan. 2018. 10 Years of the UK Climate Change Act. Policy Paper. London School of Economics and Political Science, Grantham Research Institute on Climate Change and the Environment, Centre for Climate Change Economics and Policy. http://www. lse. ac. uk/GranthamInstitute/publication/10-yearsclimate-change-act.

Ferrara, A. R., et al. 2017. Assessing the Impacts of Cohesion Policy on EU Regions: A Nonparametric Analysis on Interventions Promoting Research and Innovation and Transport Accessibility. *Papers in Regional Science* 96(4): 817–41.

Fieldhouse, E., and E. Hollywood. 1999. Life after Mining: Hidden Unemployment and Changing Patterns of Economic Activity amongst Miners in England and Wales, 1981–1991. *Work, Employment and Society* 13(3): 483–502.

Fitzgerald, J., and N. G. Leigh. 2002. *Economic Revitalization: Cases and Strategies for City and Suburb.* London: Sage.

Fothergill, S., and N. Guy. 1994. *An Evaluation of British Coal Enterprise*. Barnsley: Coalfield Communities Campaign.

Gibbons, S., H. Overman, and M. Sarvimäki. 2020. The Local Economic Impacts of Regeneration Projects: Evidence from UK's Single Regeneration Budget. *Journal of Urban Economics* 122(4): 103315.

Gore, T., et al. 2007. Coalfields and Neighbouring Cities: Economic Regeneration, Labour Markets and Governance. Report. Joseph Rowntree Foundation, York.

Government of Scotland 2021 (p41). Scottish Budget: 2021-2022. https://www.stf.org.uk/wp-content/uploads/scottish-budget-2021-22.pdf

———. 2020. State Aid: Guidance. https://www.gov.scot/publications/state-aid-guidance/pages/regional-aid-and-assisted-areas/ (October 8, 2020).

Green, F., and A. Gambhir. 2020. Transitional Assistance Policies for Just, Equitable and Smooth Low-Carbon Transitions: Who, What and How? *Climate Policy* 20(8): 902–21.

Hackney, J., 2018. Financial Crises and Filling the Small Business Credit Gap: The Role of Government-Guaranteed Loans. Available at SSRN 2876653.

Hall, S. 2000. The Way Forward for Regeneration? Lessons from the Single Regeneration Budget Challenge Fund. *Local Government Studies* 26(1): 1–14.

House of Commons Committee of Public Accounts. 2016. Cities and Local Growth. Parliament, London.

Hyslop, F. 2009. SDS Letter of Guidance. https://www.skillsdevelopmentscotland.co.uk/media/42279/sds-letter-of-guidance-2009-10-final.pdf.

Imrie, R., and H. Thomas. 1993. The Limits of Property-Led Regeneration. *Environment and Planning C: Government and Policy* 11(1): 87–102.

Industrial Communities Alliance. 2020. Levelling Up: The Infrastructure Needs of Older Industrial Britain. Report. Barnsley, UK.

Institute of Welsh Affairs (IWA). 2011. Punching above Its Weight: Review of the Coalfields Regeneration Trust in Wales. Cardiff.

International Labour Organization (ILO). 2015. Draft Policy Guidelines for a Just Transition towards Environmentally Sustainable Economies and Societies for All. Report for Discussion at the Meeting of Experts on Sustainable Development, Decent Work and Green Jobs, 5–9 October 2015, Geneva.Jones, P., M. Wynn, D. Hillier, and D. Comfort. 2017. A Commentary on the City Deals in the UK. *Journal of Public Affairs* 17(3): e1661.

Jones, P., Wynn, M., Hillier, D. and Comfort, D., 2017. A commentary on the City Deals in the UK. *Journal of Public Affairs* 17(3), p.e1661.

Just Transition Commission. 2020. Advice on a Green Recovery. Report for Government of Scotland. https://www.gov.scot/publications/transition-commission-advice-green-recovery/.

Kerslake. 2018. Lord Kerslake: Let's Reignite the Possibilities of Localism. Place: publisher? https://www.themj.co.uk/Lord-Kerslake-Lets-reignite-the-possibilities-of-localism/210003 (March 2, 2021).

Kitson, M., and J. Michie. 2014. The Deindustrial Revolution: The Rise and Fall of UK Manufacturing, 1870-2010. Cambridge: Centre for Business Research, University of Cambridge.

Klagge, B. and R. Martin 2005, p. 35 Decentralized versus Centralized Financial Systems: Is There a Case for Local Capital Markets? *Journal of Economic Geography*. 5(4): 387–421

Martin, R., A. Pike, P. Tyler, and B. Gardiner. 2016. Spatially Rebalancing the UK Economy: Towards a New Policy Model? *Regional Studies* 50(2): 342–57.

McPherson, A. H., and S. M. McDonald. 2010. Measuring the Outcomes and Impacts of Innovation Interventions: Assessing the Role of Additionality. *International Journal of Technology, Policy and Management* 10(1–2): 137–56.

Mercier, S. 2020. Four Case Studies on Just Transition: Lessons for Ireland. Research Series Paper (15), National Economic and Social Council, Dublin.

Moore, C. 2016. *Margaret Thatcher: At Her Zenith: In London, Washington and Moscow*. New York: Vintage.

Murray, R., J. Baldwin, K. Ridgway, and B. Winder. 2005. Socio-Economic Decline and Adaptation: South Yorkshire's Former Coalfields. *Local Economy* 20(4): 344–59.

National Audit Office. 2009. Regenerating the English Coalfields. Report by the Comptroller and Auditor General. London.

Oei, P.-Y., H. Brauers, and P. Herpich. 2020. Lessons from Germany's Hard Coal Mining Phase-Out: Policies and Transition from 1950 to 2018. Climate Policy 20(8): 963–79.

OGUK. 2019. Economic Report 2019. Available at https://www.ofgem.gov.uk/sites/default/files/docs/2020/02/oguk_evidence_economic_report_2019.pdf

Perchard, A. 2013. "Broken Men" and "Thatcher's Children": Memory and Legacy in Scotland's Coalfields. *International Labor and Working-Class History* 84: 78–98.

Pike, A., et al. 2015. Local Institutions and Local Economic Development: The Local Enterprise Partnerships in England, 2010–. *Cambridge Journal of Regions Economy, and Society* 8(2): 185–204.

Prospects and HECSU. 2020. Skill Shortages in the UK. Association of Graduate Careers Advisory Services, Sheffield, UK.

Pugalis, L., and A. R. Townsend. 2012. Rebalancing England: Sub-National Development (Once Again) at the Crossroads. *Urban Research & Practice* 5(1): 157–74.

PWC. 2018. Will Robots Really Steal Our Jobs? Report. London.

Rhodes, J., P. Tyler, and A. Brennan. 2003. New Developments in Area-Based Initiatives in England: The Experience of the Single Regeneration Budget. *Urban Studies* 40(8): 1399–426.

———. 2007. The Single Regeneration Budget: Final Evaluation. Cambridge: Department of Land Economy, University of Cambridge.

Rodríguez-Pose, A., and E. Garcilazo. 2015. Quality of Government and the Returns of Investment: Examining the Impact of Cohesion Expenditure in European Regions. *Regional Studies* 49(8): 1274–90.

Palley, T. I. 2005. From Keynesianism to Neoliberalism: Shifting Paradigms in Economics. In *Neoliberalism: A Critical Reader*, edited byA. Saad-Filiho and D. Johnston. London: Pluto Press.

Scottish Parliament 2019, p. 43 Meeting of the Parliament 15 January 2019. https://archive2021.parliament.scot/parliamentarybusiness/report.aspx?r=11885&mode=html

Stark, Chris, Mike Thompson, and Climate Change Committee. "Net Zero The UK's contribution to stopping global warming." (2019).

UK Department for Business, Innovation and Skills. 2010. Local Growth: Realising Every Place's Potential. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/32076/cm7961-local-growth-white-paper.pdf.

———. 2014. An Introduction to Assisted Areas. https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/365657/BIS-14-1152-An-introduction-to-assisted-areas.pdf.

UK Government. 2015. RGF Annual Monitoring Report 2014 – 15.

Van Reenen, J., Overman, H., Criscuolo, C., & Martin, R. 2012. The causal effects of an industrial policy.

Wales and Welsh Assembly Government. 2010. Climate Change Strategy for Wales Delivery Plan for Emission Reduction. Caerdydd: Llywodraeth Cynulliad Cymru.

Wales National Assembly. 2015. Well-being of Future Generations (Wales) Act 2015. Available at https://www.legislation.gov.uk/anaw/2015/2/contents/enacted

Ward, M. 2020. City Deals. House of Commons Library. London.

Welsh Government. 2019. Prosperity for All: A Low Carbon Wales. Available at https://gov.wales/sites/default/files/publications/2019-06/low-carbon-delivery-plan_1.pdf.

Wills, J. 2016. Emerging Geographies of English Localism: The Case of Neighbourhood Planning. *Political Geography* 53: 43–53.