

Leeds analysis by CPP - 17.01.2022

Overview – Leeds’ story for a just transition

Leeds is an economically successful city – it has higher earnings, output per head and skills levels than many other comparable UK cities. Leeds also benefits from a world class university, large financial services sector and a vibrant cultural and creative sector. But alongside these strengths, Leeds also has substantial pockets of high deprivation with many communities not having access to the opportunities the city has to offer. These areas of deprivation are particularly around the city centre - an area where high Green House Gas (GHG) emitting jobs are heavily concentrated. We calculate that approximately 7% (or 31,000) of all jobs held by employees in Leeds are working in high emitting industries - with both the manufacturing and transport sectors accounting for around 11,000 jobs each. Greening transport in the city will therefore be an important but not sufficient response to the strengths and vulnerabilities we identify.

The city’s strengths mean it is well-placed to lead in the creation of new innovations and capital investment to combat climate change and the high skilled segments of its population are well-equipped to capitalise on the opportunities to come. But these developments must take all of the city’s residents with them, especially those living in highly deprived neighbourhoods and working in industries that are either in decline or where jobs will need to substantially adapt to survive decarbonisation. A concerted approach needs to be taken to ensuring the costs and challenges of the transition do not fall disproportionately on the citizens least able to bear them, which will be driven by the local authority with the strong support of stakeholders across business, civil society, and anchor institutions. This is the fundamental challenge for Leeds, but one which it is in a strong position to address.

About this note

As part of the implementation advice received by Leeds as a member of the Inclusive Growth Network (IGN), this note outlines the findings of an initial exploration into the risks and opportunities facing Leeds as the city strives towards its goal of becoming net zero by 2030.

The first section of the document details risks, with an initial focus on employment in high emitting industries – this is the type of employment most at risk of changing or ceasing to exist due to net zero efforts. It then explores the city’s economic resilience more broadly, profiling the key economic and demographic characteristics of Leeds in relation to other UK cities as well as the rest of the Yorkshire and Humber region. Finally, the risks section outlines sources of pollution within Leeds beyond the jobs that people are currently doing – such as domestic, transport and commercial emissions – to provide a holistic view of the climate-related challenges facing the city.

The second section explores Leeds’ strengths and opportunities. The discursive section provides a snapshot of institutions and developments across the city and outlines key challenges for making the most of these assets as Leeds seeks to become an inclusive net zero city.

Key takeaways

Employment in at risk industries

- There are approximately 31,000 jobs held by employees in Leeds in high emitting industries. The broad manufacturing and transport sectors account for approximately 11,000 jobs each.

- There is a substantial geographical concentration of this employment. Out of 482 Lower Super Output Areas (LSOA) in Leeds, 20 account for 2/3rds of all high emitting employment.
- The areas with higher employment in high emitting industries tend to be, on average, more deprived.
- Greening transport will not be enough. A fair transition to net zero will need to consider how to support both those working across a number of sectors including manufacturing and energy as well as transport to ensure no-one is left behind.
- Failure to support these individuals could lead to greater deprivation in already deprived neighbourhoods if their jobs cease to exist or they are unable to adapt to new job roles, thereby risking an intensification of existing economic inequalities in the city.

Economic resilience

- Leeds' economic profile is strong relative to other UK cities and the rest of Yorkshire and the Humber region. Earnings, employment rate, qualification and GVA per head are comparatively high.
- However, there is substantial socioeconomic diversity across the city. Analysis of deprivation data shows that some neighbourhoods – particularly those concentrated in the centre of the city – experience significant levels of deprivation.
- Leeds is an economically successful city – ensuring that economic opportunity is evenly shared throughout the city is a critical ongoing challenge for the local authority and partners.

Overall emissions within Leeds

- When looking at CO2 emissions in Leeds, there is a higher level of pollution per capita than in other UK cities. This is mainly driven by road transport emissions which is significantly higher than in other cities, while Leeds also has somewhat higher household emissions.
- A key challenge here will be how to reduce reliance on petrol cars without incurring significant economic costs on those who can least bear it.

Strengths and opportunities

- We have not sought to create an exhaustive list but hope the institutions and developments outlined below will be a useful starting point in thinking about how some of the city's existing assets can best support inclusive green growth:
 - o ***The University of Leeds as a global leader in climate change:*** As well as being a world class university, it opened the multi-disciplinary Priestley International Centre for Climate in 2016 and in 2019 opened a campus-based "innovation hub" that supports high-growth start-ups to connect with expertise across the university. Ensuring new research on climate change translates into real world economic outcomes - particularly for the people of Leeds - will be a critical ongoing challenge. As there is increasing pressure on UK universities to enable civic capacity within their cities and to demonstrate local impact via their research, the local authority is in a strong position to mobilise the university as a key anchor institution in the drive towards an inclusive net zero transition.
 - o ***Establishing a green finance hub:*** The strength of Leeds' financial services sector has encouraged the Government to establish two new institutions – the UK Infrastructure Bank and the UK Centre for Greening Finance and Investment. Key next steps are to explore how the development of a green financial services hub can support the

creation of good green jobs within Leeds – particularly for families on low incomes across the city – and does not exacerbate economic inequalities.

- ***A green and inclusive cultural and creative sector:*** As an internationally renowned hub for the cultural and creative industries (including fashion), Leeds is in a good position to catalyse on the culture sector's role in the local economy and in driving the city's collective identity as a centre of innovation. Key next steps are to set out a clear and mutually agreed plan to decarbonise, with initiatives such as Sustainable Arts in Leeds (SAIL) already going some way to convene this and demonstrate that the city is leading by example.
- ***The presence of several renewable energy sites:*** Leeds has a comparatively large number of renewable energy sites (9 operational and 1 under construction). Key next steps will be understanding the extent to which these sites already employ (or will employ) people from Leeds, as well as the types of people and skills required.
- ***Proximity to a green industrial cluster:*** For Leeds, the nearest cluster is the Humber Industrial Decarbonisation Roadmap. Given the development of multiple renewable energy sites across Leeds and given its world class university, key next steps will be exploring whether there are ways of working together and sharing learnings between Leeds and the Humber LEP on how to derive the most economic benefit from decarbonisation.

Part 1: Understanding risks for Leeds

Concentration of employment in energy intensive industries

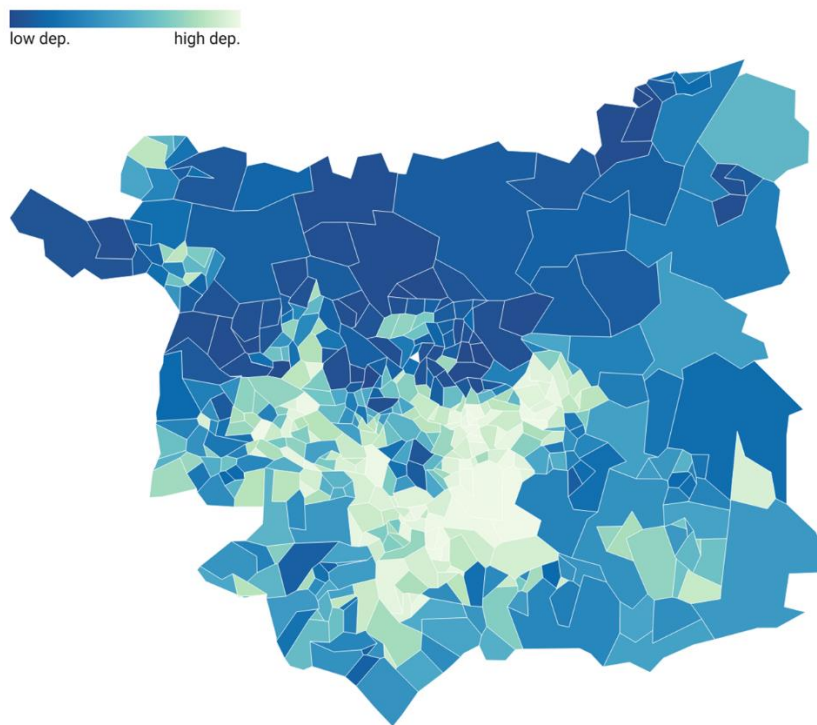
We initially focussed on understanding the type of employment in Leeds and explored the extent to which it is concentrated in high emitting industries. To do this we use industry GHG emissions intensity at the UK level and combine this with the Business Register and Employment Survey for local authorities and lower super output areas.¹

We define high emitting industries as those with a GHG emissions intensity that is greater than the total emissions intensity for the UK as a whole. Using this definition, we estimate that around 7% of all jobs held by employees in Leeds is in high emitting sectors (around 31,000 jobs). In terms of overall high emitting jobs held by employees, the broad manufacturing and transport sectors account for approximately 11,000 jobs each. Air transport has the highest GHG emissions intensity of any industry at a UK level and accounts for about 0.6% of jobs held by employees in the city (2,500 jobs).

¹ We use the 2 digit codes from the Business Register and Employment Survey 2020 and combine this with UK emissions intensity by industry. BRES is accessible via Nomis. The emissions data can be found here: <https://www.ons.gov.uk/economy/environmentalaccounts/datasets/ukenvironmentalaccountsatmosphericmissionsgreenhousegasemissionsintensitybyeconomicsectorunitedkingdom>

14058, whereas in the top 20 high emitting areas it is 9249 (lower scores mean higher deprivation). The same is true for subdomains of deprivation – looking at education and skills for instance the Leeds LSOA average is 15,431 whereas for the 20 high emitting LSOAs its 10,561. The map of education and skills deprivation below shows how concentrated it is within the centre of Leeds.

Skills deprivation in Leeds by LSOA (using IMD 2019)



Map data: © Crown copyright and database right 2021 • Created with Datawrapper

Source: CPP analysis

Updated risks rankings for Leeds

Earlier this year CPP published work which ranked local authorities on the risk of experiencing a bad transition to net zero.² We have updated all the data for this and rerun the analysis with a focus on where Leeds sits in relation to 1) other large UK cities and 2) Yorkshire and the Humber region.

Before revealing where Leeds ranks its worth looking at the raw data for Leeds. Leeds compares quite favourably on several key measures of economic vulnerability/strength. Earnings, employment rate, qualification levels, GVA per head and economic diversity are things it does better in. Demographically, Leeds has a slightly older population than average and is more populous.

Leeds does badly compared to other cities on the emissions jobs index (nb. this is the sum of the share of jobs for each industry multiplied by the UK GHG intensity for each industry). But it is important to note that this is driven by the 2,500 jobs in air transport - without this, Leeds would be in line with the city average. Many other UK cities have airports nearby but not within the city boundary so to some extent Leeds comparatively poor performance on this metric is an artificial construct – other cities

² The rationale and methodology for the rankings and analysis can be found here: CPP (2021) *Leaving no place behind in the race to net zero*: <https://www.progressive-policy.net/publications/leaving-no-place-behind-in-the-race-to-net-zero>

have simply exported the problem to other areas. Nevertheless, having an airport within Leeds presents a challenge as the city seeks to decarbonise industries and employment.

City comparison table

	Median earnings	Employment rate	% level 4+	% level 2+	Median age	Population size	GVA per head	Emissions jobs	Econ diversity
UK city average (exc. Leeds)	£448.08	70.76	43.53	74.98	33.07	514,678	£29,141.14	11.39	3.14
Leeds	£485.10	76.90	46.70	79.90	35.11	798,786	£34,265.75	16.66	3.29

When compared with the rest of Yorkshire and the Humber, Leeds does better on all measures. And particularly so when it comes to earnings, skills and GVA per head.

Yorkshire and the Humber comparison table

	Median earnings	Employment rate	% level 4+	% level 2+	Median age	Population size	GVA per head	Emissions jobs	Econ diversity
YH local authority average (exc Leeds)	433.3	74.3	35.5	75.9	43.5	236,378	22164.7	21.4	3.1
Leeds	485.1	76.9	46.7	79.9	35.1	798,786	34265.7	16.7	3.3

Transforming the data into rankings is helpful for quickly comparing vulnerability/strengths across places (lower ranks mean greater risk). Bristol and Cardiff are the closest to Leeds in terms of the economic strengths and as mentioned Leeds does badly on emissions and jobs (compared with other similar cities) because of air transport jobs within the city.

City risk rankings

Area	Area code	Emissions jobs	Median earnings	Employment rate	% level 4+	% level 2+	Median age	Population size	GVA per head	Econ diversity
Bristol, City of	E06000023	309	246	151	292	284	344	343	292	329
Leeds	E08000035	161	207	226	246	207	327	353	297	350
Cardiff	W06000015	246	169	159	269	207	337	335	286	228
Glasgow City	S12000049	298	187	48	290	128	317	352	301	331

Manchester	E08000003	159	101	42	261	107	351	350	324	307
Nottingham	E06000018	266	30	137	184	135	353	327	280	263
Sheffield	E08000019	253	97	48	254	187	323	351	155	291
Liverpool	E08000012	268	173	115	205	37	329	344	240	258
Newcastle upon Tyne	E08000021	240	57	98	222	104	346	310	273	245
Birmingham	E08000025	299	117	5	130	104	341	354	196	317
Coventry	E08000026	279	160	56	159	100	347	336	225	154
Bradford	E08000032	251	129	84	86	18	306	348	79	321
Leicester	E06000016	297	9	23	108	6	350	333	219	286

The rankings also show how well Leeds performs relative to other Yorkshire and the Humber local authorities. North Lincolnshire, Selby, Richmondshire and Ryedale are particularly vulnerable with employment more concentrated in high emissions industries and doing comparatively badly on most other economic and demographic measures.

Yorkshire and the Humber risk rankings

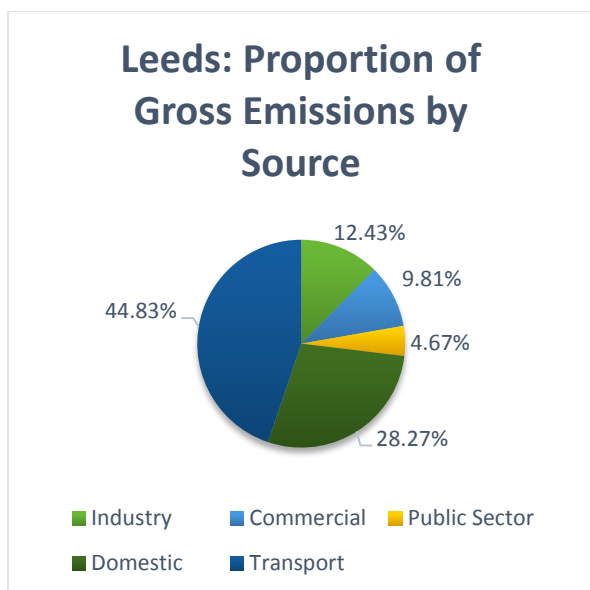
Area	Areacode	Emissions jobs	Median earnings	Employment rate	% level 4+	% level 2+	Median age	Population size	GVA per head	Econ diversity
Leeds	E08000035	161	207	226	246	207	327	353	297	350
York	E06000014	334	139	233	253	281	292	261	265	330
Harrogate	E07000165	177	179	255	177	254	63	224	244	336
Sheffield	E08000019	253	97	48	254	187	323	351	155	291
East Riding of Yorkshire	E06000011	54	109	164	191	246	32	330	123	308
Wakefield	E08000036	176	38	235	34	55	226	332	173	341

Craven	E0700 0163	158	2	323	259	292	14	11	243	268
Hambleton	E0700 0164	31	110	314	189	281	21	53	227	179
Bradford	E0800 0032	251	129	84	86	18	306	348	79	321
Calderdale	E0800 0033	203	129	173	122	134	188	262	161	173
Rotherham	E0800 0018	99	36	137	92	187	211	290	80	241
Kirklees	E0800 0034	208	99	60	80	68	253	342	67	281
Doncaster	E0800 0017	147	146	60	17	31	229	312	89	342
Kingston upon Hull, City of	E0600 0010	231	14	84	6	4	315	284	189	305
Barnsley	E0800 0016	128	83	96	30	93	193	276	40	322
Ryedale	E0700 0167	13	78	44	272	272	18	8	201	161
Richmondshire	E0700 0166	28	17	337	58	199	128	6	41	217
North East Lincolnshire	E0600 0012	121	104	53	11	22	179	219	108	272
Selby	E0700 0169	18	199	248	42	12	127	52	205	83
North Lincolnshire	E0600 0013	8	52	118	73	64	129	228	218	76
Scarborough	E0700 0168	204	39	38	63	142	20	104	96	87

Beyond employment: other sources of pollution in Leeds

In addition to exploring employment in Leeds, we have looked at all sources of emissions in Leeds by analysing the ONS' UK local authority and regional carbon dioxide emissions national statistics: 2005-2019.³ One thing that stands out is how critical tackling transport emissions will be to Leeds on its route to net zero. Emissions from transport activity account for the largest share of overall emissions in Leeds compared to other sources (45% of total).

³ <https://www.gov.uk/government/statistics/uk-local-authority-and-regional-carbon-dioxide-emissions-national-statistics-2005-to-2019>



Source: CPP analysis

Comparable cities

Leeds has the highest total emissions per capita of all of the cities in our analysis. We can see that this is driven in large part by the high level of per capita emissions in transport. Domestic emissions per capita are also higher.

Area	Total Emissions Per Capita	Industry Per Capita	Commercial Per Capita	Public Sector Per Capita	Domestic Per Capita	Transport Per Capita
Leeds	4.89	0.61	0.48	0.23	1.39	2.20
Cardiff	4.43	0.60	0.55	0.27	1.20	1.82
Newcastle upon Tyne	4.06	0.33	0.57	0.43	1.29	1.43
Glasgow City	3.81	0.47	0.57	0.33	1.20	1.22
Sheffield	3.79	0.67	0.42	0.23	1.31	1.20
Bradford	3.79	0.71	0.33	0.18	1.41	1.18
Manchester	3.65	0.31	0.65	0.31	1.08	1.30
Liverpool	3.61	0.38	0.46	0.33	1.21	1.22
Birmingham	3.58	0.48	0.38	0.24	1.23	1.25
Leicester	3.44	0.82	0.35	0.24	1.17	0.86
Coventry	3.40	0.53	0.30	0.23	1.14	1.21
Nottingham	3.32	0.30	0.46	0.36	1.16	1.04
Bristol, City of	3.18	0.28	0.44	0.22	1.18	1.07

Source: CPP analysis

By comparison to the rest of the Yorkshire and Humber region, Leeds has lower carbon emissions per capita, although several places still do better than Leeds.

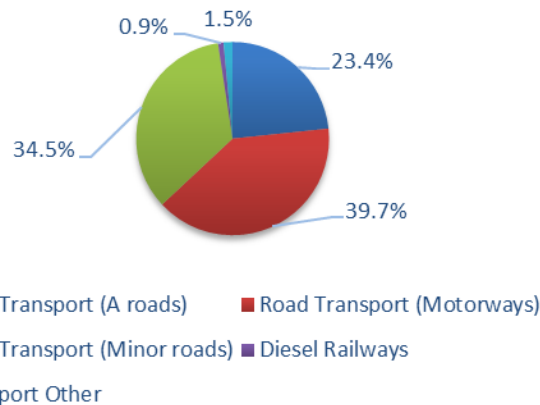
Yorkshire and the Humber

Area	Total Emissions Per Capita	Industry Per Capita	Commercial Per Capita	Public Sector Per Capita	Domestic Per Capita	Transport Per Capita
North Lincolnshire	39.99	34.20	0.63	0.17	1.50	2.78
Selby	8.65	3.21	0.44	0.10	1.57	3.57
Hambleton	8.44	1.69	0.49	0.19	1.75	4.49
East Riding of Yorkshire	8.01	2.82	0.57	0.18	1.62	2.40
Richmondshire	7.51	1.11	0.61	0.19	1.64	4.21
North East Lincolnshire	7.39	3.50	0.66	0.30	1.39	1.55
Ryedale	7.33	2.27	0.52	0.45	1.80	3.49
Harrogate	6.56	0.86	0.64	0.22	1.76	3.23
Doncaster	6.43	1.00	0.46	0.19	1.60	2.99
Craven	6.29	1.33	0.46	0.11	1.78	2.50
Rotherham	5.98	1.39	0.48	0.22	1.52	2.43
Wakefield	5.82	1.38	0.53	0.25	1.44	2.26
Barnsley	5.35	1.37	0.31	0.12	1.64	1.98
Leeds	4.89	0.61	0.48	0.23	1.39	2.20
Calderdale	4.81	0.86	0.30	0.12	1.56	1.98
Scarborough	4.45	0.92	0.51	0.18	1.68	1.37
Kirklees	4.29	0.80	0.30	0.15	1.48	1.58
Kingston upon Hull, City of	4.17	0.99	0.37	0.21	1.28	1.32
York	3.83	0.36	0.50	0.20	1.35	1.47
Sheffield	3.79	0.67	0.42	0.23	1.31	1.20
Bradford	3.79	0.71	0.33	0.18	1.41	1.18

Source: CPP analysis

Transport emissions is the principal driver of Leeds poor performance compared with other cities while household emissions are also comparatively high. Leeds has a high density of all forms of road transportation. So greening road transport must be a key priority for the city.

Leeds: Proportion of Total Transport Emissions by Transport Type



Source: CPP analysis

Part 2. Strengths and opportunities for net zero

Alongside looking at the risks facing Leeds, explore some of the institutional developments that provide opportunities for Leeds to drive for net zero in an inclusive way. We do not have all the answers, and this is not an exhaustive list, but hope the following is a useful starting point in thinking about various features of the city that could be particularly important. We include questions worth further exploration which focus on how these institutional developments might foster good local employment and inclusive economic growth.

World class university

The University of Leeds is a world-class institution which ranks within the top 100 of the QS World University Rankings, boasting several world-leading departments and institutes providing real-world solutions to tackling climate issues. As an institution it is the third largest employer in Leeds, contributing around £1.3bn annually to the UK economy.⁴ Recent estimates also indicate that every £1m of revenue generated by the University will produce a further economic impact of £1.31m in the UK, £0.97m of which stays locally within the Yorkshire and Humber region.⁵

Critical to translating the presence of the university into local economic opportunity is the strengthening of coordination for research on net zero, and the expansion of university-business engagement that supports the diffusion of new knowledge among local enterprises. The university is at the forefront of these objectives, making several advances in recent years to strengthen its institutional standing in the city's net zero objective. Firstly, the opening of the Priestley International Centre for Climate in 2016, the university's flagship climate institution which brings together researchers from across the University of Leeds to collaborate on delivering climate-oriented solutions, will increase capacity to produce world-leading multi-disciplinary climate research. Secondly, the recent opening of *Nexus* in 2019, a campus-based innovation hub that supports high-

⁴ Leeds University. (2015). Investing in Knowledge and Opportunity: Strategic Plan 2015-2020. Available at: https://www.leeds.ac.uk/download/76/strategic_plan_2015

⁵ Leeds University. (2015). Investing in Knowledge and Opportunity: Strategic Plan 2015-2020. Available at: https://www.leeds.ac.uk/download/76/strategic_plan_2015

growth start-ups to connect with expertise and facilities across the university, will be important in ensuring research outputs help to support the growth of existing businesses, the development of new enterprises in new sectors, and the wider decarbonisation mission in Leeds.⁶

While the importance of the university to the city and its green ambitions are clear, there are questions about how new research on climate change can translate into real world economic outcomes. For instance, what is the scale of the new business creation facilitated by Nexus and job opportunities this might present? What are the types of economic opportunities being driven by the universities research and business outreach? What might this offer to lower income families living and working in Leeds?

The growth of the ‘civic universities’ movement – highlighting the role of universities in enabling local civic capacity – will be key to this. With the establishment of the Civic University Commission⁷, Chaired by Lord Kerslake, in recent years, UK universities are more than ever being encouraged to prove how they can play a central role in helping their host communities to thrive. This is linked to increased demand on universities from funding bodies to demonstrate local impact via their research. Given this, the local authority is in a strong position to leverage its role as the city’s convenor of place to work with the university as a key anchor institution in the drive towards an inclusive net zero transition.

Creating a green finance hub

Leeds is well placed to capitalise on its growing financial services sector and develop a green finance cluster within the city. Leeds already has the largest financial services sector in England outside of London employing 40,000 people, accounting for 38% of the city’s total output, which is forecast to generate over half of the city’s GVA growth over the next decade.⁸

The strength of the city’s financial services sector has encouraged the UK Government to establish two new institutions that it sees as fundamental to the development of the UK’s green finance sector in Leeds, both of which opened in 2021. The first is the UK Infrastructure Bank, whose core mission is to deliver finance for infrastructure to tackle climate change and support local growth across the UK, opening with an initial £22bn of available finance. The second is the UK Centre for Greening Finance and Investment, a research centre providing environmental and scientific intelligence that will support financiers to calculate the environmental impact of their investments.

Both institutions are in their formative stages presenting an opportunity for the local authority to shape and influence their development. There is an opportunity to position Leeds as the go-to location in the UK for financial institutions seeking to expand the amount of money they lend or invest in sustainable business and infrastructure. This may mean, for instance, seeking to encourage finance firms to move their bases into Leeds, and/or encouraging the finance sector to provide more capital for sustainable businesses and infrastructure within the city. Given the growth opportunities that green finance offers and the strength of the city’s existing financial services sector, Leeds is in a unique position to capitalise and make green finance central to its broader green growth ambitions.

There do however, remain questions about the types of economic opportunities a green finance sector will provide. Key questions to explore include: How can the development of the green financial services sector support the creation of good green jobs within Leeds? How can this help to support

⁶ See more here: <https://nexusleeds.co.uk/>

⁷ See more here: <https://upp-foundation.org/about-us/civic-university-network/>

⁸ Leeds City Council. (2022). Leeds economy. Available at: <https://www.leeds.gov.uk/leeds-economy>

families on low incomes across the city? And how might it benefit those who may lose their jobs in the transition to net zero as their industries adapt or become obsolete?

Leeds as a national cultural and creative industries hub

As an internationally renowned hub for the cultural and creative industries, including the fashion industry, Leeds is in a good position to catalyse on the culture sector's role in the local economy and in driving the city's collective identity as a centre of innovation. The city's growing cultural industries should be encouraged to be at the forefront of change through holding space for conversation, advocacy, education and inspiration around sustainability and collective responsibility to achieve the city's net zero goals inclusively.

The local authority may consider its role in harnessing the sector's ability to contribute creatively to wider city conversations with citizens and communities around climate change and how it and the city can positively respond. With one role of the local authority and local political leadership being to make net zero and sustainability meaningful to citizens, the presence of a thriving creative sector in Leeds with deep connections to communities is a strong asset in helping to engage more widely around these issues.

Additionally, the creative industries should be encouraged to act as an exemplar to other industries by foregrounding sustainability values and practices through innovative products, services and systems. The sector should set out a clear and mutually agreed plan to decarbonise, with initiatives such as Sustainable Arts in Leeds (SAIL) already going some way to lead this drive by developing a pathway to net zero roadmap.⁹ As well as helping to achieve the city's net zero goals and growing the green economy locally, all of this will be strategically important in continuing to develop Leeds' Place Narrative and identity both nationally and on the world stage. Mobilising the role of the city's fashion industry will be pivotal here due to its clear connections to the global supply chain. These local economic advantages may help Leeds to establish itself as a centre of leadership around sustainability and inclusive green growth.

Relevant renewable energy sites

One aspect of economic opportunity from the transition to net zero is the creation of new technologies to decarbonise the economy and the creation of jobs to build, manage and use such technology. While official statistics on this type of "green" employment are not yet available, there is evidence on the number and type of renewable energy sites by local authority.

The Renewable Energy Planning Database shows that Leeds has 10 renewable energy sites that are either operational (9) or under construction (1).¹⁰ Taken together, these sites should have energy capacity of 95.3 megawatts (MW). This is larger than other large cities such as Manchester (6 sites with 48.3 MW capacity) and Sheffield (6 sites with 75 MW capacity). However, Leeds' comparatively strong position on green energy capacity is driven by its only under construction site which will account for 49.9 MW of capacity.

Understanding the extent to which these sites already employ (or will employ) people from Leeds, as well as the types of people and skills are important next steps. In addition, Leeds city council can play a role in driving inclusive growth outcomes by ensuring planning permission for future sites is

⁹ <https://wearesail.org/>

¹⁰ <https://www.gov.uk/government/publications/renewable-energy-planning-database-monthly-extract>

contingent upon certain criteria related to inclusive growth – such as the provision of good jobs, particularly for those living in more deprived parts of Leeds.

Leeds renewable energy sites

Site name	Technology Type	Total capacity (MWelec)	Development Status
Buslingthorpe Power Station (Leeds North)	Biomass (dedicated)	2	Operational
Wothersome Grange Farm House AD - crops	Anaerobic Digestion	1	Operational
Knothrop WWTW AD	Anaerobic Digestion	2.4	Operational
Skelton Grange Landfill	Landfill Gas	5.2	Operational
Peckfield Quarry Landfill Scheme	Landfill Gas	3.9	Operational
Cross Green ERF	EfW Incineration	11.6	Operational
Hook Moor	Wind Onshore	10.3	Operational
Knothrop Sewage Treatment Works	Anaerobic Digestion	4	Operational
Haigh Hall Solar Farm (Resubmission)	Solar Photovoltaics	5	Operational
Land Adjacent to 4 Redcote Lane (Armley)	Battery	49.9	Under Construction

Source: CPP analysis of Renewable Energy Planning Database (REPD): September 2021

Access to nearest green industrial cluster

Another potential opportunity is being close to a green industrial cluster. The stated ambition behind green industrial clusters is to support certain geographical areas attract inward investment and drive demand for low carbon products and technologies by harnessing the power of markets, the public sector, universities and local communities.¹¹

For Leeds, the nearest cluster is the Humber Industrial Decarbonisation Roadmap. According to the Humber LEP which is helping to develop the roadmap, the Humber cluster is concentrated in locations around the Humber Estuary. It includes the UK's main centre for steel production; two oil refineries; two major chemicals clusters; and biofuel, cement, lime and glass manufacturers. It is part of the Energy Estuary, which includes the largest offshore wind farm under construction in the world; several existing and planned gas-fired power stations; and the UK's largest biomass power station. The UK's largest ports complex and the UK's largest Enterprise Zone underpin the area's potential for further industrial growth.¹²

While an ambitious project in its own right, there is a question about the extent to which this cluster impacts on and offers opportunities for Leeds. The one and a half hour car journey between Leeds and Humber may prohibit people who live in Leeds from seeking employment within the emerging green cluster while public transport takes significantly longer. Nevertheless, given the development of renewable energy sites across Leeds and given its world class university, there might be ways of

¹¹ On industrial clusters see:

https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/803086/industrial-clusters-mission-infographic-2019.pdf

¹² <https://www.humberlep.org/project/humber-industrial-decarbonisation-roadmap-hidr-phase-1/>

working and sharing learnings between Leeds and the Humber LEP on how to derive the most economic benefit from decarbonisation.