

Manchester Zero Carbon 2038

Draft Business Case for Action
February 2019

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Executive Summary

This document highlights the potential high-level socio-economic benefits to Manchester's residents, businesses and the public sector from citywide action to become a zero carbon city. It is being published in February 2019 as a draft document, alongside the draft Zero Carbon Manchester Framework 2020-38.

Its purpose is to set out a socio-economic case for ambitious action on climate change in Manchester, in addition to achieving Paris-aligned carbon reduction targets. The draft business case is based on already available research and further analysis undertaken by Manchester Climate Change Agency.

Additional work is required to further develop the business case for Manchester's rapid transition to become a zero carbon city. It is hoped that by publishing this document as a draft it will provide the basis for further analysis and research by researchers and partners looking to support Manchester's efforts.

What does a Zero Carbon Manchester Look Like?

New Jobs and Graduates

- 30,000 new entrants working in the environment and sustainability sector
- High annual pay for graduates with environmental degrees and 87% employment rate upon graduation
- Increase of STEM graduates and STEM skills development, allowing for the city to capitalise on the £6.7 billion the STEM graduates gap could cost to the UK annual economic growth

Retrofit and Insulation

- A third of households' heating spending saved and reinvested in the city economy as disposable income
- 60% of Manchester houses receiving energy efficiency improvements and £49 million to £141 million per year collectively saved to households
- 55,000 jobs created through a significant deep retrofitting programme across Greater Manchester
- 34,000 households led out of fuel poverty, saving £17 million per year to the NHS
- 16% reduction in household 6-month health service usage, after a year of an average energy efficiency retrofit intervention

Air Quality

- 116,000 electric vehicles (EVs) circulating in Manchester, saving households £674 annually in fuel and maintenance costs, amounting to a citywide saving of £78 million annually, with the potential of being reinvested in the local economy as disposable income
- Increased usage of public transport and bikes, reducing the cost to GM businesses as a result of traffic congestion (currently £1.3 billion per year)

- Lower rate of hospital admission for asthma (currently the highest cause of admission)
- No premature deaths due to air pollution (currently 1,000 per year across GM)
- More green spaces and less vehicles on the road, reducing the GM percentage of inactive adults (currently 50%, and costing the NHS £500,000 per week)
- Healthier Mancunians, due to less health and social problems as a result of air pollution, such as: lung cancer, cardiovascular disease in adults, worsening of heart conditions, slower cognitive ability in older people, negative impacts on mental and physical development in children, and societal problems including reduced and school absenteeism

Food and Wastage

- Significant food waste reduction, at the moment costing the average household between £470 to £700 a year, amounting to approximately £1 billion household expenditure across GM
- New businesses and jobs created thanks to innovative waste management models
- More efficient usage of still edible food waste, helping the current 10% of all Mancunians suffering from food poverty
- More nutritious, fresh, balanced and healthier diets thanks to the promotion of seasonal and locally produced food

Economic Growth

Low Carbon Economy, Overview

The Climate Change Committee expects the Low Carbon Economy to have a market size of between £210 billion and £600 billion in 2030, growing in 2050 to a size ranging from £510 billion to £1400 billion¹. Moreover, by 2030, the UK's clean economy has the potential to support 2 million jobs, grow at a 4x the rate of GDP growth and to generate up to £170bn of annual exports². Globally, the business opportunities linked with sustainable development were estimated to be worth \$6.2 trillion in 2015, with the first movers being the main beneficiaries of these opportunities³. Thus, given the potential size of the market and the economic opportunities it carries, it makes sense for Manchester to capture a significant size of that market and to profit from the first movers advantage by promptly and significantly acting on and investing in the Low Carbon and Environmental Good and Services Sector (LCEGS) economy.

Currently, in Manchester, the LCEGS sector is worth £5.4 billion to the Greater Manchester economy and is growing at a rate of 6% per year, employing 38,000 people across over 2,000 businesses⁴. Continuing at this rate the sector will be worth £17 billion by 2038. Analysis on the low and zero carbon power sector led by IPPR has shown that in the North of England there is the potential for 46,000 jobs to be created in the field by 2030, potentially rising to 100,000 by 2050 across the low carbon economy⁵. Examples of the low carbon economy's potential can already be seen across the city, such as the Business Growth Hub which worked with over 130 low carbon companies in Greater Manchester between 2014 and 2017, creating 66 jobs and £8.2m in sales⁶.

Examples of Manchester Businesses

Resin Surfaces Ltd

Stockport-based manufacturer Resin Surfaces Ltd (RSL) will be saving £56,000 annually thanks to the introduction of a can-crushing machine which allows to handle waste packaging more efficiently and to reduce the need for re-packaging, and thanks to the introduction of reusable and returnable packaging.

Manchester Rusk Company Ltd

Manchester Rusk Company specialize in the production of high quality seasoning, glazer and sauces, and have managed to save £293,000 annually by introducing initiatives to reduce and recycle packaging and reduce energy usage.

¹ [UK business opportunities of moving to a low carbon economy](#) – Committee on Climate Change

² [Green GB & NI 2018 Toolkit](#)

³ Perrini, 2018.

⁴ [Playing our Full Part](#)

⁵ [Risk or reward? Securing a just transition in the north of England](#) – IPPR

⁶ [Business Growth Hub](#)

Graduates and Manchester

As set out in the Our Manchester Strategy, Manchester has an established objective to “increase the proportion of graduates and number of apprentices in the city”⁷. A rapid move towards a low carbon economy would help to achieve such goal. Across the UK, it is estimated that by 2020 595,000 entrants will be needed to work in environment and sustainability, among which 447,000 would be replacing retired workers⁸. Given that GM accounts for 5% of the LCEGS⁹, it can be estimated that 30,000 new entrants will be needed in Greater Manchester. Additionally, the employment opportunities offered in the future by the environmental sector are only predicted to continue increasing¹⁰.

Moreover, the Office for National Statistics¹¹ found that the average gross annual pay for graduates with environmental degrees working in the sector is the 4th highest compared to every other subject, amounting to £38,012, and that the employment rate for graduates in the sector is 87%. Many of the high-level skills that are in high demand in the low-carbon energy sector are readily available in carbon-based generation and are highly transferable to low and zero carbon roles. These include engineering, process design, project management, asset management and commercial and business management. Moreover, the average salaries for project managers and engineers are comparable in both the oil and gas sector and the renewable energy sectors¹².

A Shell report¹³ predicted a shortage of STEM graduates to cover all the 49,225 new recruits needed annually by the low carbon sector, which is due to rise to 1,040,000 by 2023. This skill gap could cost £6.7 billion to annual UK economic growth and have a strong impact on low-carbon innovation¹⁴. Manchester could capitalise on this potential opportunity by creating incentives for STEM students, who would then remain in the city, contribute to the city growth and innovation, and allow for the city to capture a portion of the £6.7 billion of economic growth that would otherwise be lost.

⁷ [State of the City Report 2018](#)

⁸ [Overview of the UK's environmental sector](#) - Prospects

⁹ [Business Growth Hub](#)

¹⁰ [Environmental Sector](#) – University of St. Andrews

¹¹ [Graduates in the UK labour market: 2017](#) – Office for National Statistics

¹² Ibid.

¹³ [Shell Springboard](#)

¹⁴ Ibid.

Waste Management and Circular Economy

There are several economic benefits that come from reducing, reusing and recycling materials¹⁵. Recycling has been proven to be cheaper than the alternatives of landfill and incineration. It also allows avoiding the payment of landfill or potential LATS (Landfill Allowance Trading Scheme) fines. Secondly, it generates cash by creating material that will generate income once recycled and sold. Thirdly, it brings new business opportunities in the reprocessing sector, especially in places that have a strong manufacturing industry. Finally, it has been proven that recycling creates more jobs than its alternatives, incineration and landfill¹⁶.

Moreover, the cost of disposal to landfill keeps rising, while median gate fees for waste recovery/recycling options are still lower than those for waste disposal routes. In the 2018 WRAP report on the annual gate fee survey compared the gate fees of waste disposal facilities (£/tonne), and the results for the North West show that Materials Recovery Facilities have lower gate fees than landfill and Materials Recovery facilities¹⁷.

	EfW	Landfill	MRF
Median	£90	£28	£25
Mode	N/A	£25 - £30	N/A
Range	N/A	£8 - £42	£1 - £60
Count	3	8	4

There are several business and entrepreneurial opportunities deriving from the need for an innovative and efficient recycling system, as well as new areas that could be tackled by inventive business models such as the diversion of unwanted supermarket food from landfill to make local preserves, the conversion of restaurant oil waste into biofuel, and the up-cycling and restoration of old furniture or materials¹⁸.

Currently, only 10% of waste in Manchester belonging to households in apartment blocks is recycled¹⁹, whilst there has been a 25% decrease of refuse of households receiving refuse bins, which can lead to cost avoidance of over £8 million per year. Between 2016 and 2018 there has been an increase of 3% in the proportion of household-waste recycled (from 36% to 39%)²⁰. In 2017/18 financial year, the council has spent £1,126,000 in an environmental Capital Programme including Waste Collection²¹. Reducing municipal waste generation will allow the City Council to reduce such expenditure.

Best Practice

¹⁵ [Recycling](#) – Friends of the Earth

¹⁶ Ibid

¹⁷ [Gate Fees Report 2018](#) - WRAP

¹⁸ [How recycling helps the community](#) - GD

¹⁹ [State of the City Report 2018](#)

²⁰ [Manchester City Council Annual Report 2017/18](#)

²¹ Ibid.

Nationally

Cambuslang and Rutherglen, Scotland²²

R:evolve Recycle is run by Lightburn Elderly Association. An intergenerational project in Cambuslang and Rutherglen, Scotland whereby the older generation are sharing skills to help the community repair, upcycle or swap clothes to reduce the amount of textiles landfilled. The project allows all members of the community to essentially swap and trade clothes using a 'points' system, without the clothes being thrown away. 2 tonnes of clothes are processed every month.

Halifax, UK

Through the introduction of clear rubbish bags, the town has managed to reduce the amount of refuse going to landfill by 24%,²³ and has increased recycling by 19.4%²⁴.

Internationally

Kwinana Waste to Energy Project, Kwinana, Australia²⁵

Scheduled to open by the end of 2021, the facility will divert up to 50% (400,000 tonnes per annum) of the residential (post-recycling) rubbish collection in the Perth metro area from landfill sites. 50,000 households will be powered up through the combustion of such waste, whilst stopping hundreds of thousands of tonnes of kerbside rubbish from going into landfill.

The construction of the 36MW (net) plant will have a capital cost of ~\$450 million and will last 3 years. In this time frame, 800 jobs are expected to be created, along with a range of subcontracting and supply opportunities for local business. After opening, 60 operational and management jobs will be required.

Cherry Hill, NJ, USA

Between 2008 and 2016 the city in New Jersey introduced [RecycleBanks](#) which rewarded households for recycling with discounts and deals from local and national businesses. During that period, recycling rates increased by 137%.

²² [LEAP Projects](#)

²³ [CBC](#)

²⁴ [CBC](#)

²⁵ [Phoenix Energy](#)

Fuel Poverty, Insulation and Retrofit

In Manchester, domestic property is the largest emitting sector²⁶. 16.2% of households in Manchester are classed as fuel poor, 5.6% higher than the national average (10.6%), and 34,000 low-income households live in fuel poverty²⁷. According to analysis for Manchester, using the SCATTER tool²⁸, energy efficiency needs to be improved by 75% in at least 60% of Manchester homes to help meet the city's carbon reduction targets.

£1 in every £3 spent heating UK homes is wasted due to poor insulation²⁹. Thus, there is the potential for a third of current heating expenditure in poorly insulated houses to become available to improve the quality of life of low income residents, and for it to be potentially reinvested in the city economy as disposable income. Cambridge Econometrics and Verco³⁰ have found that bringing all homes across the UK to the EPC band C by 2035 can save £4.5 billions in annual energy bills. In terms of job creation, in Greater Manchester, 55,000 new jobs could be added if a significant deep retrofit programme is put in place³¹.

SHAP³² has calculated that for basic retrofit work costing £3,228, the annual energy cost savings amount to £378, while a deep total retrofit would cost £46,500 and allow households to save £1,089 yearly in energy bills (a 76% reduction from the original bill). Thus, treating 60% of the houses in Manchester would create a potential collective annual savings across households ranging from £49 million to £141 million, according to the type of retrofit operations needed. However, savings on energy costs that can be obtained by refurbishing a house vary according to the house model. The table below reports the total annual cost savings and CO₂ lifetime reduction of bringing different house models to a band B Energy Efficiency Rating³³.

	Original EPC rating	Total cost saving per year	CO ₂ Lifetime Reduction
1950's Semi-Detached House	E	£ 658	60%
Post 2002 Mid-Terrace House	C	£ 171	29%
Period Mid-Terrace House	E	£ 651	62%
Period End-Terrace House (with 1970's extension)	F	£ 993	57%
1980's Mid-Floor Flat	E	£ 528	49%
1980's Detached House	E	£ 663	57%
1960's Semi-Detached Bungalow	E	£ 695	66%
Solid-Walled Detached House	F	£ 1,651	78%

²⁶ [Playing Our Full Part – Technical Appendix](#)

²⁷ Manchester Climate Change Conference - 2018

²⁸ [Anthesis](#)

²⁹ [Tackling fuel poverty](#) - Local Government Association

³⁰ [Building the Future](#) – Cambridge Econometrics and Verco

³¹ [Springboard](#)

³² [Finance Models for Retrofit](#) - SHAP

³³ [Energy Saving Trust](#)

There are several options available in order to finance an estate retrofit project: loans or investments, cost reduction approaches, cost recovery approaches, subsidies and grants. The SHAP's report '[Finance Models for Retrofit](#)' further explore the topic and the different models.

Furthermore, The Greater Manchester Business Case has calculated that the NHS, thanks to less winter pressure and lower mortality, can save up to £1 million per year for every 2,000 households helped out of fuel poverty³⁴. Thus, if all 34,000 households in Manchester that are currently affected were led out of fuel poverty there is a potential saving for the NHS of £17 million a year. Studies have shown that a year after an average retrofit intervention, a 16% reduction in household 6-month health service use can be found, along with significant general improvements in the household health status³⁵.

Additionally, a Bloomberg analysis has showed how houses that are in areas at risks of climatic disasters such as floods, storms and wildfires have lost value during the years³⁶. This is especially relevant to the City of Manchester considering that there are 16,526 properties in flood risk areas throughout the city³⁷. Between 2007 and 2017, average homes in areas facing the lowest risk of flooding, hurricanes and wildfires were worth more than the ones at greater risks, which were worth less in 2017 than in 2007.

Best Practice

In Manchester

Manchester Cathedral³⁸

Before 2015, Manchester Cathedral's last major heating repairs were in the 1950/60's. Therefore, they were only operating at 60% efficiency. Ground source heat pumps were installed in 2015, making the Cathedral now one of the greenest in the UK. Flooring was also replaced to be more heat efficient.

Nationally

Nottingham³⁹

Through a cross-city energy efficiency scheme – Greener Housing – the city delivered the second highest reduction of fuel poverty in the UK, managing to insulate over 2,500 private homes and 4,200 social houses, as well as providing free electricity to 4,200 NCH tenants through the installation of solar panels. Moreover, the not-for-profit company Robin Hood Energy was set up to provide low-cost energy and special tariff in order to further tackle fuel poverty.

Bristol

³⁴ [Playing our Full Part](#)

³⁵ Bray *et al.*, 2017

³⁶ [Bloomberg](#)

³⁷ MCC Conference

³⁸ [Manchester Cathedral](#)

³⁹ [Working to Tackle Fuel Poverty](#) – My Nottingham News

From September 2008 and December 2012, Bristol Energy Efficiency Scheme insulated 10,000 homes across the city, providing free loft insulation top-up for lofts with less than 150mm existing insulation⁴⁰. In 2016, the City Council set up Bristol Energy as an ethical, non-profit energy supplier, providing the local community with affordable energy while returning profits to local services and community-owned initiatives⁴¹. In 2018, the city launched the Fuel Good Fund which will directly help families in implementing home energy improvements⁴².

Kirkless⁴³

From 2007 to 2010, the Kirkless Warm Zone project insulated over 51,000 homes, saved 55,000 tonnes of CO₂, generated £80 million in economic benefits and won the 2009 Ashden Award 'Best Local Authority Sustainable Energy Scheme in the UK'.

Lincolnshire⁴⁴

Home Energy Lincolnshire Partnership (a partnership of all the district councils of Lincolnshire) rolled schemes and projects to improve domestic energy efficiency and saved local residents over £1 million in energy bills.

London⁴⁵

In order to work on the 341,000 households living in fuel poverty, the City has set out the Fuel Poverty Action Plan. The plan revolves mainly around 3 points: boosting income of households living in fuel poverty, increasing energy efficiency, and delivering an energy supply company which can offer fairer energy bills.

Internationally

Energiesprong, Netherlands

Energiesprong offers an innovative financing model for whole-house housing retrofits to zero energy standards, with scope to develop into the private-home market as well. Tenants pay the housing association an energy service plan (similar to a phone bundle) with an allowance for a guaranteed indoor temperature, plus an allowance for hot water per day and a power bundle for light and appliances. The objective is that tenants have the same monthly expenses. The housing association uses this new income stream to pay for the retrofit⁴⁶.

Clearer Air – health and well being

Air pollution is linked with lung cancer, cardiovascular disease in adults, worsening of heart conditions, slower thinking skills in older people, negative impact with mental and physical

⁴⁰ [Centre For Sustainable Energy](#)

⁴¹ [Bristol Energy](#) – Simply Switch

⁴² [Bristol Energy](#)

⁴³ [Kirkless Warm Zone](#) -Yes Energy Solution

⁴⁴ [West Lindsey District Council](#)

⁴⁵ [Greater London Authority](#)

⁴⁶ Silvestrini, 2016

development in children and societal problems such as productivity reduction and school absenteeism⁴⁷.

Exposure to air pollution costs the UK (from a societal, health and business perspective) more than £20bn per year.⁴⁸ Moreover, the European Commission has calculated that air pollution costs the UK 5,700 deaths, 1,600 hospital admissions for lung and heart problems, and 2,400 new cases of bronchitis every year⁴⁹. Air pollution also impacts the activity levels, medications taken and life expectancy of the most exposed people, which are often in the lower socio-economic strata⁵⁰.

It has also been proven how some pollutants can cross through the placenta when inhaled by pregnant women, which can affect the growth of the unborn baby and lead to premature birth. In addition, although they may take years to become apparent, the effects of the environment of the foetus can have life-lasting consequences.

Tackling air pollution could bring the UK an economic benefit of £3.4bn every year⁵¹. A US Environmental Protection Agency report has shown that the economic benefits of clean air are greater than the costs of tackling it by a factor of more than 30 to 1⁵². Otherwise, if not acted upon, this trend is only meant to worsen as studies have predicted 1.5 million of new cases of diseases in the UK between 2017 and 2025 (rising to 2.5 million to 2035), amounting to a cost of £5.5 billion to the NHS⁵³.

An IPPR report⁵⁴ highlighted the pollution problem in Greater Manchester. 10 people a day die early because of poor air quality, while traffic congestion costs GM businesses £1.3bn a year⁵⁵. Manchester has the highest rate of hospital admission for asthma in the country, and 1,000 people die prematurely in the city every year. Moreover, Manchester council ranks second worst in England for PM10 particulate pollution and the region has one of the worst polluting bus fleets in the UK, with 20% of the fleet make up of most polluting vehicles (10% in London). Finally, at present, more than 600 people are killed or seriously injured on GM roads every year and 50% of adults in GM are physically inactive which costs the local NHS over £500,000 per week. In contrast, a recent UK study showed that walking or cycling to work led to an overall 46% reduction in the risk of cardiovascular disease⁵⁶.

The GMCA, along with Manchester's 10 local authorities and TfGM, are working together in collaboration with Public Health England and the government's Joint Air Quality Unit to develop a single Clean Air Plan⁵⁷. By using government guidelines to shortlist the most effective policies, GM is considering a range of measures to reduce roadside NO2 levels. Several measures are already underway, such as:

⁴⁷ [State of the City Report 2018](#)

⁴⁸ [Every Breath We Take](#) - Royal College of Physicians

⁴⁹ Ibid.

⁵⁰ Pervin, Gerdtham and Lyttkens, 2008

⁵¹ [Every Breath We Take](#) - Royal College of Physicians

⁵² [US Environmental Protection Agency](#)

⁵³ Pimpin *et al.*, 2018

⁵⁴ [Atmosphere](#) - IPPR

⁵⁵ [Playing Our Full Part – Technical Appendix](#)

⁵⁶ [Made to Move](#) - TFGM

⁵⁷ [Clean Air Greater Manchester](#)

- A GM Congestion Deal, including a £400 million investment to upgrade junctions, tackle bottlenecks, provide new roads and deliver new 'smart' traffic signals
- A Bee Network, a £500 million investment to deliver 1,000 miles of cycling and walking networks
- Plans for the introduction of 27 new trams from 2020, and the construction of a new tram line to the Trafford Centre
- A TfGM's 24-hour control centre
- Working with businesses to promote sustainable commuting and business travel
- Campaigns to raise awareness and offer practical advice on how to take actions

Best Practice

Nationally

London⁵⁸

- From 2018, all new double decker buses will be hybrid, hydrogen or electric – the entire bus fleet will be emission free by 2037
- From 2019, 12 new low emission bus zones and the world's first Ultra Low Emission Zone
- A new Toxicity ('T') Charge of £10 for the most polluting vehicles
- A massive rollout of cycling and walking infrastructure
- Initiatives to help Londoners make better choices, including a Cleaner Vehicle Checker for those buying new cars and a Clean Air Route Planner to help find residents find the least-polluted journeys

Nottingham⁵⁹

The council has introduced a Workplace Parking Levy (WLP) which charges employers who provide workplace parking. The charge is of £402 for employers who provide 11 or more liable places. The money raised from this charge help financing the extension to Nottingham tram system and the redevelopment of the city Rail Station, and to support the bus network.

Internationally

Paris, France

During the weekend, cars are banned in the historic central areas while during major pollution events public transport is free.

Vehicles are split into six categories, depending on how heavily polluting they are according to European emissions standards, and the most polluting have been banned from the city. Moreover, any vehicle can be refused entrance in response to high levels of pollution on a given day. To mitigate adverse consequences and to encourage low-pollution transport, the city makes public transport free during these periods⁶⁰.

The Netherlands

⁵⁸ [Atmosphere](#) - IPPR

⁵⁹ [Nottingham City Council](#)

⁶⁰ [Three Steps UK Cities Can Take To Tackle Air Pollution](#) – Centre For Cities

By 2025, the government has confirmed the implementation of a ban on the sales of petrol and diesel engine cars.

Freiburg, Germany

The German city has created a programme which offers cheaper housing and free public transport to people who decide to live without a car.

Oslo, Norway

The city has delivered 40 miles of new bike lanes, steep congestion charges, a rush-hour fee for motorists and has removed many parking spots.

Zurich, Switzerland

The city has reduced and put a limit on the parking space in the city. Moreover, just a certain amount of cars are allowed in the city at any one time.

Barcelona, Spain⁶¹

Barcelona's urban mobility plan focuses on the idea of superblocks – the idea of redirecting traffic in grids around small neighbourhoods, with space within these superblocks dedicated to pedestrian and cycling public space. Through this, the city hopes to shift preferences from driving to walking and cycling.

Milan, Italy

Milan is one of five cities across the world which has introduced congestion charges in their central area. The €5 tax is charged between 7.30am to 7.30pm. In addition, vehicles entering the area must fulfil a minimum emission standard and diesel vehicles must be equipped with a particulate filter. Electric vehicles have free access and hybrid cars are exempt until a set date. The profits are used to reinvest in policies that promote sustainable mobility and reduce air pollution.

New York, NY, USA

The NYC Clean Heat program helped 2,700 buildings convert to cleaner fuels. As a result, over 250 tons of particulate matter (PM2.5) has been removed from New York City's air since fall 2011, which is the equivalent of removing over 800,000 vehicles from the road for an entire year. The NYC Department of Health and Mental Hygiene estimates that these save 780 lives per year and prevent 1,600 emergency room visits each year. This is a 25% reduction in all health incidents attributed to air pollution.

New-York City introduced an anti-idling law in 2009 to reduce unnecessary emissions from idling vehicles parking or stopping. In particular areas, it is forbidden to idle in a vehicle for longer than three minutes while parking, waiting or stopping. This is even stricter around schools, where the time allowed is just one minute.^{62,63} With due exceptions, heavy duty vehicles, including diesel trucks and buses, cannot idle for more than five minutes at a time. Fine ranges from \$5,000 to \$18,000 in the case of a first violation⁶⁴.

⁶¹ [Three Steps UK Cities Can Take To Tackle Air Pollution](#) – Centre For Cities

⁶² Ibid.

⁶³ [Idling Regulations](#) - NYC Business

⁶⁴ [New York State Department of Environmental Conservation](#)

Delhi, India⁶⁵

New large diesel car and SUVs with engines higher than 2,000cc have been banned from the city, while a phasing out programme of diesel taxis has started.

⁶⁵ [How are cities around the world tackling air pollution?](#)

EVs and Transport

Electric Vehicles (EVs) are predicted to amount to over 50% of global car sales by 2040⁶⁶. For EVs the UK potential global market size ranges between £45bn to £95bn yearly in 2030, in addition to the potential creation of 320,000 jobs⁶⁷.

In 2016, the Office of National Statistics calculated the weekly average UK expenditure fuel for cars to be £19.40⁶⁸, or a monthly expenditure of around £80. Electricity costs are 60% cheaper than their petrol equivalents, and maintenance costs are 10% cheaper⁶⁹. There is therefore the potential for each household to save up to £560 yearly on fuel and £114 in maintenance costs if they were to make the switch to EVs. Along with the savings from fuel and maintenance, additional savings can be obtained in terms of car tax (VED tax)⁷⁰.

According to the Committee on Climate Change (CCC), at least 60% of the vehicles on the road need to be electric if we are to meet the standards to tackle Climate Change. This means that to comply with the CCC guidelines and to meet the Manchester population increase prediction by 2025⁷¹ and the cars/vans per 1,000 people ratio⁷², approximately 116,000 EVs would need to circulate in Manchester. This entails a cumulative potential yearly saving across all households owning a car/van of £78 million through reduced fuel and maintenance costs, which could potentially circulate in the local economy.

Furthermore, it is calculated that there is a need for one charging point for every 10 EVs⁷³. To meet the demand of 116,000 EVs Manchester would therefore require 11,276 new charging points. Current installation costs per charging point are £7,500⁷⁴, which would bring the total cost of installation of all points to £84.6 million. This number can be assumed to lower if such project was to be put in place because of economies of scale.

Nationally, it is estimated that investment opportunities of £300-£500 million for 2,200 charging sites could be opened up by a consistent scheme with charging points along major interconnecting routes⁷⁵. This would mean that the total investment opportunity to meet the demand for charging points in Manchester can be estimated at £15.8 billion.

⁶⁶ [Green GB & NI 2018 Toolkit](#)

⁶⁷ [Towards a New Normal](#) - Aldersgate Group

⁶⁸ [Office for National Statistics](#)

⁶⁹ [Clean Air GM](#)

⁷⁰ Ibid.

⁷¹ [State of the City Report 2018](#)

⁷² [RAC Foundation](#)

⁷³ [New Civil Engineer](#)

⁷⁴ [Business Green](#)

⁷⁵ [Future Low Carbon in the UK](#) – Green Alliance Trust

Best Practice

In Manchester

Manchester Metropolitan University⁷⁶

The University owns 14 electric vehicles: 5 of those are pool cars available for any staff member registered on the University pool car system, while the remaining 9 are used as fleet vehicles for use by internal maintenance staff. As of November 2018, 150,000 miles in EVs have been travelled since the implementation of the scheme. This allowed strong carbon savings - 14 tonnes of CO₂ in the last financial year - and financial benefits, in terms of savings in mileage claims and £23,000 saved on fuel spend.

Nationally

Bristol⁷⁷

Thanks to £2 million provided by the Office of Low Emission Vehicles (OLEV) through the Go Ultra Low West project, Bristol has plans to add 120 new charging points, as well as purchasing seven electric Peugeot Partner vans to be used by various council departments, with the aim of having at least 10% of the city's fleet made up of EVs by 2021.

Milton Keynes⁷⁸

To encourage the use of Ultra Low Emission Vehicles (ULEV), Milton Keynes Council offers local incentives, such as a wide network of dedicated charging points across the borough and a free Green CMK Parking Permit, which allows ULEVs to park for free in standard rate parking bays.

Internationally

Oslo, Norway⁷⁹

35,000 out of the 77,000 EVs present in Norway are in the Oslo-region. The EV success is linked with local and national incentives developed to promote zero emission vehicles such as no tax purchase, no VAT, free parking, free passing through the toll ring, access to the bus lane, free charging and free transport on ferries. Moreover, essential to the EV success has been a strong operation with key stakeholders like EV Users Associations, Environmental NGOs (Zero & Bellona), R&D organizations, and relevant partners in EU projects (FREVUE, SEEV4 City).

⁷⁶ [Clean Air GM](#)

⁷⁷ [Intelligent Transport](#)

⁷⁸ [Get Smarter Travel MK](#)

⁷⁹ [C40 Cities](#)

Colorado Springs, USA⁸⁰

The city partnered with local car dealerships and provided incentives for residents purchasing EV such as potential federal tax incentive for up to \$7,500 and a Colorado state tax incentive of \$5,000. Nissan is also offering \$3,000 off on the 2018 Nissan LEAF to Colorado Springs residents.

⁸⁰ [The Colorado Springs Business Journal](#)

Food and Food Waste

Food consumed represent 30% of the national carbon footprint. The miles food travelled also contribute to the UK environmental costs⁸¹. Industrial agriculture and livestock are also a major source of greenhouse gas emissions⁸². The carbon footprint of the global food waste stands at 3.3 billion tonnes CO₂e per year, making it the third top emitter after USA and China. Additionally, 30% of the world's agricultural land area is occupied with produced but uneaten food (1.4 billion hectares of land)⁸³. To tackle all of this, it is important to promote and incentivise the local production of food, which leads to benefits for the local economy and general health of residents.

Across Greater Manchester, over 400 sustainable initiatives exist already but there is a significant potential for economic growth within the sector. In fact, by producing more food on GM's Green Belt land, 20,000 jobs could be created⁸⁴. Projects such as Sow The City, which support food-growing within the city, bring several benefits for the community and for the city as a whole. The organisation has found that their projects have up to 6:1 return on investment for society. In fact, common green areas and community gardens encouraging social bonding are a source of education and learning, and create jobs and volunteering opportunities. Furthermore, they have positive implications health-wise: daily gardening reduces the risk of dementia by 36% in older people and generally improve mood⁸⁵.

In the UK, 15 million tonnes of food a year is wasted, 60% of which comes from hospitality and food services⁸⁶. The annual national total cost of domestic food waste is £12bn, costing the average household £470 a year, or £700 for families with children⁸⁷. In Manchester, 420,000 tonnes of usable food is thrown away yearly by households, while the average household bins weekly the equivalent of six meals⁸⁸. On average, total GM household expenditure on domestic food waste amounts to approximately £1 billion. For businesses, acting on the prevention of food waste can allow them to save up to £300 million a year⁸⁹. Food disposal, as suggested by Real Junk Food Mcr, should be the last option after reduction, redistribution, animal feed, recycling and recovery. 4.2 tonnes of CO₂e can be stopped from polluting the atmosphere per every tonne of food saved from wastage⁹⁰. Moreover, 1 in 10 Mancunians suffer from some level of food poverty⁹¹. This could be addressed through a more efficient use of still edible food that gets instead wasted.

There are several programmes aimed at reducing food waste across the city and the UK already:

⁸¹ Petty, Lang, Morison (2005)

⁸² [Smart Cities Dive](#)

⁸³ [Food Wastage Footprint](#)

⁸⁴ [Feeding Greater Manchester](#)

⁸⁵ [Sow the City](#)

⁸⁶ [University of Manchester](#)

⁸⁷ [Working on Waste in Greater Manchester](#)

⁸⁸ Ibid.

⁸⁹ [WRAP](#)

⁹⁰ [Real Junk Food Manchester](#)

⁹¹ [Feeding Greater Manchester](#)

[Real Junk Food Mcr](#)

The City's first waste food catering social enterprise whose aim is to source potentially wasted food to prepare meals and dishes.

[The University of Manchester](#)⁹².

The University partnered with [ReFood](#) and redirected 173 tonnes of food waste from going to landfill to anaerobic digestion. The company offers businesses sustainable food waste recycling services to turn waste food into green energy for a smaller price than sending it to landfill.

[FareShare Greater Manchester](#)⁹³

With the initiative Too Good To Waste, volunteers save at least 2 tonnes of surplus fruit and vegetables from New Smithfield Market in East Manchester and redistribute it to charities, schools and food banks.

[Too Good To Go](#)

After their launch in London and Leeds, the app has landed in Manchester. The app links restaurants and stores with surplus food and customers who can buy it for up to a 90% discount.

[Courtauld 2025](#)

Greater Manchester Waste Disposal Authority (GMWDA) has signed the Courtauld Commitment 2025 which aims are:

1. A 20% reduction in the amount of food and drink wasted in the UK
2. A 20% reduction in Greenhouse Gas Intensity (GHG) of food and drink consumed in the UK
3. A reduction in impact associated with water use in the supply chain

Best Practice

Internationally

Amsterdam, Netherlands

[Foodlogica](#) transports local food across the city in electric cargo bikes which are charged through solar power.

Calgary,⁹⁴

Calgary Eats! is Calgary's Food System Assessment and Action Plan which has the aim of providing every local with access to local, healthy and environmentally friendly food. It sets several goals: supporting community gardens and urban agriculture initiatives, supporting community food programs and preventing food waste through education programs. The ultimate aim is, by 2036, to increase consumption of local food to 30%, urban food production to 5% and to have 100% of the city's food supply to be sustainably produced.

⁹² [University of Manchester](#)

⁹³ [Friends of the Earth Manchester](#)

⁹⁴ [City of Calgary](#)

Copenhagen, Denmark⁹⁵

Since 2010, Denmark has cut its food waste by a quarter. In Copenhagen, a supermarket called WeFood has opened in February 2016 selling exclusively surplus food that would otherwise be thrown away for a 30-50% discount. In less than a year it opened a new branch due to such high popularity.

Galdakao, Basque Country⁹⁶

In 2015, the Basque city has launched a Solidarity Fridge project: a fridge with special independent legal status in which households and restaurants can leave their food surplus (particular rules applies on what food can be left in it and in what packaging/labelling). In 2017, London has followed with a similar project in Brixton: The People's Fridge⁹⁷.

Almere, Netherlands⁹⁸

The city, on the outskirts of Amsterdam, is set to be the first ReGen Village (<http://www.regenvillages.com/>) in the Netherlands: a fully self-sufficient community who grows its own food, energy and handles its own waste which is used in turn to create energy.

Buenos Aires, Argentina⁹⁹

The city won in 2014 the C40 Cities Award in the category of Waste Management thanks to its Solid Urban Waste Reduction Project. Through its Recycling Centre, 30 tons of waste are treated daily and turned into an organic amendment used as a soil improver. Moreover, the city launched the Cuidemos Los Alimentos programme which, aims to promote doggy bags in restaurants and cafes, train professional kitchen employees to reduce food waste, run workshops about food waste, recover food from city markets and fairs, raise awareness of Puntos Verdes, where citizens can bring their recyclables.

⁹⁵ [DCA Actliance](#)

⁹⁶ [National Public Radio](#)

⁹⁷ [Community fridge opens in South London to reduce food waste](#)

⁹⁸ [Fast Company](#)

⁹⁹ [Beyond Food Waste](#)

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