CLEARING THE AIR

How to tackle air pollution and grow the green economy

INTRODUCING LONDON’S ULTRA LOW EMISSION ZONE
SADIQ KHAN

A FUTURE BEYOND OIL
BRYONY WORTHINGTON

GLOBAL PROBLEMS NEED GLOBAL SOLUTIONS
KARMENU VELLA
We see possibilities everywhere.

From renewable energy and cleaner burning natural gas to advanced fuels and new low-carbon businesses, BP is working to make energy cleaner and better.

Natural gas burns 50% cleaner than coal in power generation.
BEYOND OIL

The government must get us there

BRYONY WORTHINGTON, LABOUR PEER AND EXECUTIVE DIRECTOR, ENVIRONMENTAL DEFENSE FUND EUROPE

We may be distracted by milkshakes and the political drama that has engulfed No 10, but while all that goes on, a much bigger issue is unfolding. There is a growing awareness and activism around two intertwined issues: global climate change, and the health impact of air pollution.

The last time I felt this surge of concern was in the early 2000s, when the prospect of building new coal-fired power stations triggered the ire of Greenpeace and the “Blackadair” movement. At Friends of the Earth we were launching our campaign for a world-leading Climate Change Act.

The protesters today are making themselves seen and heard, which is excellent. But they would do well to take a moment to look back at the history of our efforts in the UK to tackle climate change. We may have been too slow but we have not done nothing—in fact we’re making the fastest progress of any industrialised nation.

This has not occurred by chance—it’s a result of decades of policy interventions spanning the political parties. And the activism, think tank work and lobbying which helped these policies benefit from specific goals that were both ambitious and achievable. Kids may be boycotting school—more of them are now than ever—so is what will it achieve?

This sense of outrage has led to the establishment of protest groups and one community is acting as a motivator for a new generation of activists. This will increase pressure on governments at every level to act.

"WE MUST UPDATE THE CLIMATE CHANGE ACT TO SET A NET-ZERO EMISSIONS TARGET FOR 2050"

Another feature of today’s age of environmentalism is the access that digital publishing and social media gives to sources of expert opinion, unfiltered by mainstream media. The increasing alarm and frustration felt among the scientific community is acting as a motivator for a segment of society that feels passionately about the threat of climate change and toxic air. And as warnings increase and the existential risk of climate change and the abstract threat of “fossil fuel pollution” more personal. This is part of what’s known as the “Fourth Wave of Environmentalism,” where lower costs for new sensing technologies and computing power can produce entirely new ways of studying and analysing our environment.

For those not tracking national energy statistics this may seem a long shot. And yet our electricity production has already been made dramatically cleaner. If we look back to the early 2000s the focus on coal came about because it is intrinsically far more polluting than fossil fuels such as gas, nuclear and renewables. The occupation of Kingsnorth power station kickstarted a mood of change and the court cases that followed emphasised the risks posed by coal justified the intervention. It was clear there was just need for coal.

Thanks to a succession of policies that have spammed the political parties not only was Kingsnorth scrapped, but all coal power stations in the UK are on track to close by the early 2020s. It’s important to note that the Kingsnorth protest came some 10 years after the first policy intervention to support non-fossil fuel sources of electricity. That policy, which was lobbied for by the environmentalists, secured a renewable energy target.

T he challenge is cost. But here too the facts support, rather than undermine, the case for going beyond oil. Though higher in capital costs, green electricity generators and electric vehicles are cheaper to run. Vehicles can be charged affordably (all the time but especially when the sun shines and the wind blows) and have far fewer moving parts, which reduces maintenance costs. Fortunately, with low interest rates and poor performing bond markets, there is no shortage of capital, and well-constructed policies can help it find a safe home.

At present, the hard policies that are finally here. We need to focus and underwriting investment in new sectors into a wide range of technologies and business models. The obvious solution is for the UK to pass its own laws that update both existing climate change and air quality regulations. To gain the trust of the public, that legislation must have zero emissions as its goal. In clean air law there is a well-established principle of focusing on the sources of the problem and using the best available technology to counter them. In climate legislation we have used caps on total emissions, carbon prices and targeted financial incentives to redirect the private sector’s investment strategies into a wide range of solutions. We must now apply both these lessons to the cleaning up of the transport sector.

The government must do three things, right away, to bring about systemic change. It would be a tragedy if all the efforts of the protesters and community activists and were to be dissipated with a largely symbolic response from government ministers.

First, the government must pass new laws to tackle air pollution, prioritising action where the most harm is being done and setting targets that focus on the controllable sources of that pollution.

Second, the government must update the Climate Change Act to set a net-zero emissions target for no later than 2050.

Third, the government must use the existing powers in that Act to create markets in clean transport, incentivising and underwriting investment in new technologies and business models.

All of this is possible and can be done quickly, which is crucial if we are to harness the political will generated by today’s environmentalists. Whoever finds themselves in Numbers 10 and 1 in the coming months, they will have urgent tasks to undertake: respond to the growing voices of ecological despair, rid our transport systems of oil pollution and rebases the economy on a net carbon free energy system. We are late starting but the conditions that enable this transformation are finally here. We need to focus and act now.
INTRODUCING LONDON’S ULTRA-LOW EMISSION ZONE
How the capital is cleaning up its act
SADIQ KHAN, MAYOR OF LONDON

London’s toxic air is an invisible killer and amounts to nothing short of a public health crisis. Thousands die prematurely every year in our city as a result of our harmful air, and it increases the risk of developing life-changing illnesses including cancer, heart disease, dementia and asthma. The fact that more than 450 schools in London are currently in areas that breach legal air limits is shameful.

As Mayor of London, I’ve introduced the boldest and most ambitious plans of any major city in the world to tackle air pollution. The swift action we’re delivering, including introducing the first ever Ultra Low Emission Zone in central London and cleaner bus and taxi fleets, will mean that no London schools are in illegally polluted areas by 2025. The Ulez is already reaping rewards with 74 per cent of vehicles driving into the zone compliant with the new, cleaner standards after just one month. It is set to expand even further in 2021, delivering benefits to all Londoners far beyond its boundaries.

But this issue requires more than my limited powers in London, which are restricted to controlling emissions from vehicles. We need government ministers to wake up and recognise the true scale of this health emergency. We need government ministers to wake up and recognise the true scale of this health emergency.

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### A LIVING, BREATHEING CITY

One mayor’s plan to make a million better journeys every day

**ANDY BURNHAM, MAYOR OF GREATER MANCHESTER**

Dirty, polluted air is creating a public health crisis that raises questions about health inequally and injustice. It is the pollution in our air that we breathe that affects communities who are breathing in the most polluted air.

Perhaps it is because we cannot see pollutants in the air produced by road traffic, as we can with cigarette smoke, that explains why we have been slow to act. We need to snap out of that complacency.

The figures speak for themselves—in Greater Manchester we have the highest rate of hospital admissions for asthma in the country. And, according to Public Health England, air pollution contributes to 1,200 deaths each year in our city-region alone.

The shocking truth is that breathing in dirty, polluted air—day in, day out—has a direct impact on our health and wellbeing. There is no escaping pollution in your local town or city, and the most vulnerable in our society are hit hardest—children, older people and the least well-off. It’s a strain on our society are hit hardest—children, older people and the least well-off. It’s a strain on our health services and a constraint on our economy.

The environmental agenda, including in clean air, is one of many areas where devolved city-regions can lead the way and be far more ambitious than Westminster. In Greater Manchester we aim to become carbon-neutral by 2038, 12 years sooner than the national government’s “net zero” commitment to 2050. Devolved city-regions can lead the way in tackling climate change.

We looked at a range of Clean Air Zone options, and some would have involved charges on ordinary cars if their emissions were too high. But we decided against that. The zone we’re proposing is one of a number which modelling shows would bring NO₂ pollution levels within legal limits in the shortest possible time. But it also minimises the social and economic impacts on our residents and businesses, in particular our most deprived communities, and those for whom using a car isn’t a choice but a necessity.

While the requirement to address NO₂ pollution is legally binding, city-regions have some scope to decide how best to achieve compliance. In Greater Manchester we recognise that there’s nothing more important than the health and wellbeing of our people, so we’re being ambitious. Our proposed zone would span all of our 10 local authority areas, covering 500 square miles and a population of nearly three million—the largest zone outside London.

It’s true that some sectors will find compliance more difficult than others. Our bus fleet, for example, has a high proportion of vehicles with higher polluting engines, 90 per cent of which would currently be non-compliant. We’re committed to working with operators to deliver the support required to ensure compliance, and our proposed £28m Clean Bus Fund will help bus operators upgrade to cleaner vehicles.

Similarly, we’re working with taxi and private hire vehicle owners on helping them switch to less polluting hackney cars and cars. A £28m Clean Taxi Fund is also part of our proposals, and minimum emission specifications will be a key element of our plans for common taxi and private hire licensing standards across local authorities.

Our Clean Air Plan is conditional on substantial government funding for businesses to upgrade vehicles and for the set-up and running of a Clean Air Zone. But, in common with other city-regions, Greater Manchester’s approach to improving air quality isn’t limited to a Clean Air Zone and clean vehicle funding schemes.

It’s essential we change our culture so that fewer people feel travelling by car is the best, or only, option. This demands properly funded public transport and cycling and walking networks that are highly integrated and designed around the needs of everyone. Buses, trains, trains, cycling and walking must work seamlessly together.

Greater Manchester aims for 50 per cent of journeys to be made by walking, cycling or public transport by 2040. That’s a million more sustainable journeys every day. Our Cycling and Walking Commissioner Chris Boardman has already made huge steps on the way to developing the Bee Network, the UK’s largest, high-quality cycling and walking network, working closely with local councils. It’s only devolved city-regions with control over how transport is planned and operated and, crucially, with the right level of government investment, that can create a truly integrated transport system at a regional level which focuses on moving people rather than vehicles.

Taking action on pollution will in time be good for our transport and our economy but, more importantly, our health.

### CLEAN GREEN MACHINES

How one region plans to lead the next industrial revolution—and to make it cleaner than the last

**ANDY STREET, MAYOR OF THE WEST MIDLANDS**

The west midlands is undergoing an economic transformation. It has the UK’s largest, high-quality cycling and walking network, working closely with local councils. It’s only devolved city-regions with control over how transport is planned and operated and, crucially, with the right level of government investment, that can create a truly integrated transport system at a regional level which focuses on moving people rather than vehicles.

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That is why we chose the battery centre to launch our Local Industrial Strategy, which sets out how we will continue to grow our economy while also tackling climate change. As part of this we are trialling Energy Innovation Zones across the region, where innovators and businesses are invited to test clean energy solutions.

Climate change is not a hindrance, it is an opportunity that must be grasped with both hands. This is a view I have held since my days at John Lewis where, as managing director for nearly 10 years, I worked hard to ensure the growth of our business was complemented by a responsible company ethos.

Now, as mayor of the west midlands, I am making sure my combined authority works with businesses in the region to tackle pollution.

To signal how committed we are to a greener region, the West Midlands Combined Authority, offering, achieved a high-level certificate for environmental management. This is on the authority’s zero-waste contract with Biffa, which ensures 100 per cent of our waste is diverted from landfill.

The region’s contribution as a whole has amounted to just under £1bn, of which £225m was spent on clean technologies.

Today, the west midlands has committed £250m to support clean innovation, including £200m to support clean transport. We are working with businesses in the region to create a new industry for the city and the wider west midlands, bringing with it thousands of jobs.

To help reduce emissions even further, we are encouraging people to get out on their bikes by investing in cycle paths and walkways. The west midlands has a finished cycle network with pathways steeped in history that I want every resident to enjoy.

Air pollution is a huge challenge for the region, causing an estimated 1,600 premature deaths a year. Drivers, cyclists, pedestrians and those who live near major roads are particularly affected.

Our transport investments will all help to tackle this, reducing harmful pollution and increasing people’s quality of life.

My aim is for the west midlands to be an economically thriving region but also one that is leading the Clean Industrial Revolution.
**POLLUTION: THE DATA**

Emissions have come down, but the roads are still jammed with polluting cars

The data shown here paints a clear picture. As the Environment Minister Thérèse Coffey told the editors of this report, “While air quality has improved significantly in recent years, it continues to shorten lives and has a serious impact on the health of the nation as a whole.” That analysis is borne out by these numbers. Since 1985, the emission of pollutants has declined sharply—but levels remain too high.

If the country is to cut down further then it must transform its transport system, with a shift to the use of non-fossil-fuel vehicles. As the data shows, that change is happening at a slow rate. Since 2013, the number of petrol cars on UK roads has decreased only slightly, while the number of diesel engine cars has increased.

As Caroline Lucas, the Green MP for Brighton, Pavilion, said when discussing the themes set out in this report, “Waiting until 2040 for a ban on new diesel and petrol cars just isn’t good enough. Tens of thousands of people will have died prematurely in the UK by then.”

Over a quarter of emissions in the UK come from transport. In remarks made for this report, Stephen Hammond, the health minister, said that ‘Air pollution is now the largest environmental risk linked to deaths in the United Kingdom and a significant source of ill-health.’ There can be no greater motivation to confront the problem of fossil fuel emissions than that. As Zac Goldsmith, the Conservative MP and noted environmentalist, told Prospect, “Nationally, it is time to craft a renewed Clean Air Act to bring the whole range of policies up to date.”

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**Trends in UK emissions**

*Million tonnes*

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<thead>
<tr>
<th>Pollutant</th>
<th>1985</th>
<th>2017</th>
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<tbody>
<tr>
<td>Ammonia</td>
<td>4.0</td>
<td>3.0</td>
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<tr>
<td>Nitrogen Oxides</td>
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<tr>
<td>Sulphur Dioxide</td>
<td>2.0</td>
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</tr>
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<tr>
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<tr>
<td>pm2.5</td>
<td>0.3</td>
<td>0.2</td>
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</tbody>
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**Passenger journeys on public transport (1985/86 to 2017/18)**

*Billions*

- Underground: 1985/86: 1, 2017/18: 0.5

**Emissions in the UK by sector**

- Transport: 27%
- Energy: 26%
- Business: 17%
- Residential: 15%
- Agriculture: 7%
- Waste: 4%
- Other: 1%

**Licensed cars at end of year by propulsion type**

- Petrol: 2013: 19, 2018: 18
- Diesel: 2013: 10, 2018: 12
- Electric: 2013: 0.1, 2018: 0.5
Buses are Britain’s most used mode of public transport—in 2016-7, they accounted for 59 per cent of all such journeys. Buses are a vital part of the UK’s transport network. However, many of the UK’s buses are also shabby, dirty, and in need of replacement. This has led to several government efforts to introduce more low-emission buses in the UK.

In February, the government gave £48m in funding to 19 bus operators and local authorities across the UK to help with the purchase of Ultra-Low Emission Buses (Ulebs), along with supporting infrastructure such as charging points.

Ulebs are cleaner-diesel, gas-powered and electric hybrid buses and their potential effect on the UK’s carbon footprint is substantial. Figures released by the Department for Business, Energy and Industrial Strategy in 2018 showed the transport sector is the UK’s biggest contributor to greenhouse gas emissions, and it was estimated that February’s round of funding—which is set to double the UK’s fleet of Ulebs—will help the UK save over 14,000 tonnes of CO₂ each year. Ulebs are crucial not just in cutting carbon emissions but also in improving the quality of the air we breathe. Many of the UK’s roads have illegally high levels of air pollution. This is not helped by roads being full of old buses powered by outdated engines.

While filling the UK’s streets with clean, green buses is a laudable aim, the question remains whether the government’s investment in low-emission buses will be enough to achieve the changes it wants. One can improve emissions from buses, but that doesn’t necessarily make them more desirable to use. A recent study conducted by the Urban Transport Group (UTG) found that bus patronage in the UK has been in decline for decades due to rising car ownership, expensive and unreliable services and the rise of on-demand services like Uber. If the bus services on offer are poor, there’s no guarantee that they’ll be popular, no matter how environmentally friendly they are.

Secondly, not enough is being done to encourage drivers to take up electric and other low-emission vehicles, and the UK can’t reduce its transport emissions by relying on low-emission buses alone. While electric vehicles—including buses—are cheaper to run in the long term than vehicles fuelled by petrol or diesel, they are often more expensive to buy. The financial incentives to make the switch are currently less profound in the UK than they are in other western European countries, and the infrastructure necessary to use electric vehicles, such as charging points, is not yet widespread enough to make them a practical choice.

However, there are ways forward. The UTG’s study found that bus use remains high or is even growing in urban areas like Brighton, Reading and Bristol. This is thanks to these places having affordable, high-quality bus services, or unique characteristics that make cars particularly unattractive such as congestion or a lack of parking space. This suggests it is possible to encourage people to use buses more by improving services, or by designing our towns and cities to better suit public transport.

While low-emission buses will undoubtedly help cities reach their clean air targets, they’re not a silver bullet. Upgrading the UK’s buses is welcome and the right way for the government to go. But greener buses alone will not be enough to make radical improvements to the UK’s carbon emissions and air quality, unless we make our buses more appealing to use and put them at the heart of the country’s transport strategy.
NOSE TO TAIL TRAFFIC NEEDS TACKLING TO ADDRESS AIR QUALITY

DAVID BROWN, GROUP CHIEF EXECUTIVE, GO-AHEAD

Enough is enough. Air quality has surged up the political agenda, and rightly so. For the sake of public health, the transport industry needs to do its bit to clean up the toxic, gritty environment that affects so many of our towns and cities.

A poll last year found that nearly one in five Brits worry about pollution on a daily basis, with particular anxiety about the impact on children. Asthma, aggravated coughs and colds and even long-term lung disease will be the price the next generation pays unless we tackle the problem.

The imperative is to act: clean transport accounts for more than half of all nitrogen oxide emissions, with a third coming directly from the exhausts of motor vehicles according to the European Environment Agency.

City leaders are responding—London has introduced a clean air zone which imposes a charge on drivers of polluting vehicles, with Leeds and Birmingham set to follow shortly. Public transport—and, in particular—cleaner buses and trains—must be a top priority if we’re to tackle this issue.

Other sources of pollution—coal-fired power stations, heavy industry—are reducing their output, or facing heavy regulation.

Transport has made incremental improvements—but why has a big leap forward proven so elusive?

One key factor is something we all, unfortunately, experience far too often: urban congestion. Delays on A-roads have risen by more than 10% since 2014, according to Department for Transport statistics.

In central London, despite the congestion charge, the average traffic speed is just 8 miles per hour—slower than a horse and carriage. Traffic sitting nose-to-tail, by its very nature, has more time to belch out noxious fumes, and makes pollution hotspots even worse.

As a bus operator by profession—my first job was running a London Transport bus garage—I know only too well what jams mean for our vehicles. Passengers get impatient if buses can’t stick reliably to a timetable, creating a risk that some shift towards cars or private hire vehicles—which, in turn, makes congestion even worse.

“IN CENTRAL LONDON, DESPITE THE CONGESTION CHARGE, THE AVERAGE TRAFFIC SPEED IS JUST 8MPH—SLOWER THAN A HORSE AND CARRIAGE”

Polling we commissioned last year found that commuters are already building in a 3-minute buffer on every morning journey to account for time stuck in traffic. Four out of ten said they had still been late for work at least once over a six-month period because of jams.

So what should we do? A good first step would be a more strategic approach to transport planning. A double-decker bus can take as many as 75 cars off the road. Yet while there are strategies for rail, aviation, cycling and walking, there is no national strategy to encourage bus use. Provision is inconsistent across the country, with no overarching targets or incentives for local authorities to get people on board.

Buses themselves need to be cleaner. Go-Ahead is the biggest operator of electric buses in the country and we operate the only all-electric bus garage in Waterloo. Electric power isn’t always possible or practical (for example, there isn’t yet a battery capable of reliably powering a double-decker, and hilly or lengthy routes are a challenge). So a good alternative is Euro VI diesel, providing much lower emissions than conventional vehicles.

“IF WE TRULY WANT ELECTRIC BUSES TO BE ADOPTED NATIONALLY, IT IS VITAL TO BRING THE UNIT COSTS DOWN SUBSTANTIALLY”

A Euro VI bus emits less nitrogen oxide than a Euro VI diesel car—and at least ten times less on a per-passenger basis so the benefits to public health are clearly huge (see fig. 1).

We’re ambitious to go even further. In Southampton, Go-Ahead is trialling an air filtering bus—a Euro VI bus with a particulate filter mounted on it which actively cleans the air as it drives around city streets, so that the air behind the bus is cleaner than the air in front of it.

There are plenty of other ideas in the pipeline. In Brighton, we’re testing greentronic hybrid buses so that they switch to electric power in areas we need to protect—for example, around schools or pollution hotspots—but use conventional fuel elsewhere to maintain an adequate range.

In Oxford we will shortly be launching electric sight-seeing buses that are powered from solar panels in the depot. Oxford, incidentally, is where we operate a demand-responsive bus service, PickMeUp, which allows passengers to summon a bus to the nearest street corner, providing ease of use for customers in an area of stubbornly high private car usage.

These innovations are not a straightforward business proposition: electric buses are expensive, and the infrastructure even more so.

In many communities, buses are the only way for people without cars to get to schools, places of work, healthcare or shops. Buses are heavily used by less affluent people—those in the lowest 20% of households by income typically travel 459 miles by bus each year, while those in the top quintile go just 216 miles. So we need to balance investment in green technology with the necessity of keeping fares affordable for all.

Much Treasury attention has been devoted to subsidising motorists to scrap their diesel cars. But a more cost effective approach to reducing harmful emissions in the short to medium term is to help bus operators with the cost of retrofitting vehicles to clean diesel. This presently costs around £17,000 per vehicle (see fig. 2).

If we truly want electric buses to be adopted nationally as a long term solution, it is vital to bring the unit costs down substantially—and this will involve working with the Government. There will be a need for far better infrastructure because we cannot risk buses running out of charge mid-route. That means sustained Government investment. The private sector cannot do it alone.

Shifting to cleaner power won’t solve everything; we need policymakers to put measures in place to tackle traffic congestion, and to give public transport the priority it needs in terms of road space to be attractive to serve customers. The popularity of Uber style transport, together with home deliveries of everything from wine to weekly laundry, could well make jams even worse in future.

It’s time to stop treating buses as an afterthought in national transport policy. The question to ask is—how do we truly want people to travel in a decade’s time? How can we make sure that everybody, irrespective of location or income, can easily access local services? Connectivity has never been more important in a country where nine million people say they’re lonely and lacking in social connections (a condition which research shows is more damaging for your health than smoking 15 cigarettes a day).

Go-Ahead and our industry partners are ready to step up and deliver a transformation. Cleaner vehicles mean cleaner air and a healthier environment for the next generation. That, in turn, means improved productivity and fewer days lost to sickness.

If we work together, we can get people to where they want to be not only swiftly, comfortably and efficiently—but in a way that enhances public health, too.
AIMING LOW

Britain must cut out all greenhouse gas emissions by 2050

REBECCA POW, CONSERVATIVE MP FOR TAUNTON DEANE, CHAIR OF THE ALL-PARTY PARLIAMENTARY GROUP ON ELECTRIC VEHICLES

Since 1990 the UK has grown more than any other major economy, while reducing our greenhouse gas emissions at a faster rate. This environmental leadership has spurred action among our allies, many of whom have copied our Climate Change Act with emissions reductions targets of their own.

The UK produces one in every five electric vehicles sold in Europe, and we are world leaders in low carbon sectors from offshore wind to green finance. As one of the wealthiest countries on the planet, with an unparalleled diplomatic network, we are uniquely placed to tackle habitat loss, poaching, and the illicit trades in animal parts. Yet our environmental leadership is also about our economy and our security.

Our current greenhouse gas emissions targets are not strong enough to keep global warming to 1.5 degrees. We have a duty to play our part in stopping the planet’s climate reaching irreversible tipping points. The advice from the Committee on Climate Change is clear—we need to set a legal net zero greenhouse gas target by 2050 to avoid severe consequences. There is cross-party support for this and I raised the matter at Prime Minister’s Questions, and at the highest levels of government. Many tools are in place, such as the Clean Growth Strategy, but there is much more to do.

The UK helped create the multilateral, rules-based international order, and our future security relies on using this system to tackle climate change.

As the planet warms, extreme weather events will become increasingly common, and desertiﬁcation will drive millions from their homes. We know that it is those who already live in fragile states who will bear the brunt of this change—and as these fragile states struggle to cope with increasingly scarce resources, conﬂict will become ever more likely. The Pentagon ranks climate change as one of the top strategic challenges of the 21st century. The UK therefore beneﬁts from being an environmental leader in the same way we beneﬁt from our leadership in Nato and on the UN Security Council.

As we move to a new net zero economy, we will need to develop and use new technologies from hydrogen fuel cell technology, to eco-homes, to carbon capture and storage and much more. These can all be developed, engineered and manufactured right here in the UK.

Moving first sends a clear signal to investors that the UK is the place to set up that new firm producing electric vehicle components or turbine blades. And moving faster to an electric economy, one driven by renewable power and electric vehicles, will help clean up our dirty air quicker, saving our children’s lungs and the NHS millions. A key element in tackling air pollution will be the switch to effectively zero emission for all new cars and vans and the government has set a goal to achieve this by 2040.

Innovation in this sector is moving fast and is market-led. It is likely that this target could be reached earlier than 2040 bringing with it huge beneﬁts—not just cleaner air but cheaper motoring for the consumer. Increasing our electric charging points at least tenfold will be an essential part of the move to electric vehicles. As the Chair of the Electric Vehicle All-Party Parliamentary Group I look forward to pushing this agenda forward.

The way we heat our homes will have to change, and technologies that are more energy efﬁcient as well as those that catch wasted heat that can be reused, offer scope for a booming industry. Heat networks, which capture wasted heat from industries, will become more viable in urban areas—just as they are in Germany and the Netherlands—and will help to change the face of the domestic energy supply. For example, heat generated from a waste incinerator might supply local residential streets.

These innovations will also require the participation of the British countryside. Our forests, peatlands and hillsides must play their role in suckinng carbon out of the air, reducing ﬂooding and producing healthy food.

Seizing this agenda is both economically sensible, environmentally necessary and urgent. From Margaret Thatcher’s speech to the UN on climate change, to the possibility of setting the gold standard for environmental protection in the upcoming Environment Bill we have a proud history in this area. We must do it now, and in order to encourage the behavioural change that is required we must bring the public on this journey too.

THE ENGINE OF PROGRESS

How far can the electric car go?

CHRISTIAN WOLMAR, WRITER AND BROADCASTER SPECIALISING IN TRANSPORT

Electric cars are not a new invention. When I was growing up in west London in the 1960s, Harrods delivered its wares in a silent electric van, while in contrast the cart belonging to Sam the milkman was hauled up the hill by a horse.

Modes of transport change slowly and it’s difﬁcult to predict which one will become dominant. At the beginning of the 20th century, electric and petrol-driven cars were in competition with one another, and it seemed that it would be the former that would win out. After all, they had numerous advantages, such as reliability, lack of emissions and they were easy to start. All it took was the push of a button, while petrol cars required you to turn a heavy crank (the starting motor was not invented until 1912).

Despite all this, the internal combustion engine won. Electric vehicles had a short range, and as country roads improved, increasing the potential for longer trips, their limitations became all too apparent. However, it was the discovery of huge quantities of oil and pressure from the oil companies that tipped the balance. After the First World War, the research and development that could have reduced the size of batteries and increased the power-to-weight ratio of electric vehicles was focused on making petrol-driven vehicles more efﬁcient instead.

Governments across the world encouraged the development of petrol driven cars.

Within little more than a generation, electric cars had all but disappeared and the humble milk float, which in the late 1960s replaced Sam’s horse much to his displeasure, became part of what was at the time the world’s largest fleet of electric vehicles. And then people stopped having milk delivered.

There was a flurry of developments during the oil crisis of the 1970s, but it was not really until the 1990s that there was a sustained effort to create an alternative to the internal combustion engine for the mass market. Now, prompted by increased public concern about air pollution especially in cities, there is a renewed interest in electric cars.

“THE BIGGEST CONCERN IS RUNNING LOW ON JUICE—YOU CAN’T DO ANYTHING WITH A FULLY DISCHARGED ELECTRIC CAR”

However, progress has been slow. While electric and hybrid purchases in 2018 grew by 21 per cent in the UK compared with 2017, this still only represents 6 per cent of all car sales. Moreover, if only pure plug in electric cars, rather than those that can be powered by both conventional fuel and electricity, are taken into account, that percentage is far lower—a mere 0.7 per cent, representing just 15,500 out of a total last year of just under 2.4m vehicles.

And if air pollution is the main area of concern, then it is electric cars that will lead to rapid improvements rather than the hybrids, like the familiar Toyota Prius, which still burn considerable amounts of fuel. The motor manufacturers understand this, as demonstrated by the...
emphasis on electric cars at events like the Geneva Motor Show in March. As Wired magazine reported, “Geneva 2019 was host to an eclectic mix of electric and hybrid cars, and, perhaps more importantly, by some margin more vehicles with these powertrains than ever before.”

However, according to Steve Gooding, the director of the RAC Foundation, there are several major obstacles to overcome before electric becomes the norm. He cites the “Four Rs,” Retail availability, range, recharging and residual value.

Ring up a car dealer today to ask for the latest electric model, and the likely response will be, “sorry, we have a waiting list of several months.” This is not down to excessive demand, but because the manufacturers are reluctant to produce enough—and the most likely explanation is that in a bid to create a market, the car manufacturers are treading at a loss. Therefore to force more sales equates to bigger losses. There is something of a chicken and egg situation here, as prices will not come down until demand increases substantially. Moreover, to make matters worse, the government has now cut the maximum grant available for purchasers of new cars from £2,000 to £3,500. Employees are being encouraged to fit chargers in their car parks but this is expensive.

“JUST AS HORSES WERE STILL ON THE ROAD IN MY YOUTH, THE COMBUSTION ENGINE WILL BE AROUND FOR LONGER THAN POLICYMAKERS EXPECT”

Range has always been the biggest concern of potential purchasers of electric vehicles. Being low on juice is perceived as far more worrying than running out of petrol because you can’t do anything with a fully discharged car apart from tow it to a charging point. However, according to Steve Gooding, the director of the RAC Foundation, the problem will not be as bad as many imagine. He firmly believes that the technology, giving greater range, are helping. Whereas early models had a range of 100 miles, newer ones can do in excess of 300 miles. And even these are not very expensive, very large vehicles carrying huge numbers of batteries.

When it comes to recharging, there are two things to keep in mind. The ideal situation is to have a dedicated garage where you can recharge full. For which a government grant of £500 is available. That is an option for less than half the homes in the UK. Running power lines into existing garages is often very expensive so for many people home charging will not be possible, making electric car ownership difficult or even impossible.

There are 7,000 public charging locations across the UK, but no universal standard. Instead, there are “fast” chargers—which are the most common—and rapid which are far faster. Some hybrids can only use fast, but not rapid, chargers. There is also a whole plethora of different types of cables and adaptors, as well as proprietary chargers.

The issue of providing a network of chargers is so complex that there are two separate task forces currently examining the issue, one set up by the government-sponsored Low Carbon Vehicle Partnership and the other by the Mayor of London. They need to find solutions to a huge range of issues. In the very earliest days of the internal combustion engine, motorists had to purchase their petrol from chemists. With electric vehicles, we are effectively at the “petrol 19” waistcoat and brief stage. Britain needs a universal system of provision, but that will require government intervention which is unlikely as it would force companies such as Tesco to install chargers on their own.

Gooding’s fourth “R,” the rapid fall in the residual value of electric cars, has caused a lot of concern. The market. The shortage of new cars, together with the fact that few people now buy their car outright but instead effectively lease it, means that second-hand values are now very strong.

There is little doubt that the number of electric cars on the road will increase over the next few years, a change that will be driven by government policies to phase out polluting cars. However, predicting the rate of this is very difficult. There are concerns that consumer resistance will remain high and that the availability of sufficient vehicles and charging points will continue to be a deterrent. Optimists point to the recent faster rates of growth and the fact that history is on the side of the electric car. The century of dominance of the internal combustion engine is over, they say, and concerns about pollution are already forcing the industry into developing electric alternatives—though battery-powered 40-tonne HGVs appear some way off. Governments and city authorities across the world are announcing plans to phase out fossil fuel burning vehicles, and measures such as the Ultra Low Emission Zone, introduced in London on 8th April, are likely to spread to other cities—starting the process of stimulating demand for electric vehicles.

The wider question, however, is whether electric cars will even make the slightest contribution. Environmentalists point out that they are still cars, with a lot of embedded carbon in their construction. The batteries, which are mainly lithium-ion, rather than the lead ones still used in conventional cars, not only require a lot of energy to mine but also to dispose of. Currently there is no economic way of extracting the lithium which is mined through a complex and resource-intensive process of 100,000 tonnes of water to produce a tonne of lithium. Despite demand growing rapidly, lithium, found mainly in Western South America, Australia and China, is relatively plentiful but cobalt, another metal required for battery technology, is highly scarce. In areas such as the Democratic Republic of Congo (DRC), it is mined by smallholders who use child labour. Reducing tailpipe emissions is only one part of the story.

The UK is an attractive place to invest. The OECD’s latest figures for inward flows of FDI show that only three countries in the economic community—the United States, China and the Netherlands—attract more foreign investment than the UK. However, the majority of inward investment is driven by the right incentives and policy frameworks in place. However, in a country that generally performs well in the renewable market as a whole. Government needs to stay focused on reasserting a clear overarching policy that is consistent across relevant bodies.

If the UK is truly to transition to a low carbon future, we need to develop a flexible and innovative solution that allows these renewables to work effectively and strengthen the long-term resilience of the system as a whole. Working with industry to promote the development of storage and battery technology will be crucial as renewables play an ever-increasing role in UK energy demand.

The Government has made clear that it supports clean growth and the transition to a low carbon future. But if policymakers are truly going to solve what has finally been recognised as our planet’s most pressing problem, the Government needs to complement its good intentions with focused and consistent policy that supports the sector at a whole. The tide is turning against fossil fuels and it is economically and morally imperative that the UK is at the forefront of the global journey towards a cleaner future.
To stop us falling behind neighbours, write ambitious targets into law

A NEW CLEAN AIR BILL

GERAINT DAVIES, LABOUR CO-OPERATIVE MP FOR SWANSEA WEST, CHAIR OF THE ALL-PARTY PARLIAMENTARY GROUP ON AIR POLLUTION

I n May, 16-year-old climate activist Greta Thunberg, Extinction Rebellion protesters and striking school children arrived on parliament’s doorstep to demand that urgent action be taken to lower emissions and prevent irreversible damage to our planet. They were adding to the voices from ambitious local government organised by the European Covenant of Mayors and UK 100, who have been calling on national governments to reduce emissions, especially in urban areas, that are exceeding air pollution limits set by the World Health Organisation.

If the government wants to show that it is taking our environmental crisis seriously, cutting air pollution would be a good place to start. Vehicle emissions and the excessive burning of fossil fuels are not only destroying the environment but also pose a significant risk to public health.

A new study by the European Heart Journal doubled previous estimates of annual deaths attributable to air pollution from 4.5 to 8.8m. This makes unclean air the biggest preventable cause of death globally, greater than smoking which causes 7.2m deaths per year.

The UK is not immune and of course the problem is most acute in urban centres, where congestion is worse and population density far higher. A report published last year showed that more than 40 towns and cities across the UK breach the WHO limit. It proves that this really is a national emergency.

The EHJ’s findings are the latest to paint an increasingly alarming picture. A 2018 study by the British Medical Journal linked exposure to dirty air with the development of serious lung conditions. A further study found the first evidence that pollutants can pass through a pregnant mother’s lungs and lodge in her baby’s heart. This is believed to have exacerbated her condition.

Air pollution is also linked to socio-economic factors; property prices are falling faster in areas that are exposed to levels above the WHO limit by 2025, and India by 2030, the UK is lagging behind with a target of 2040.

Meanwhile, we are all suffering the effects of unclean air in our homes, places of work and, at school. Not only can outdoor air pollution infiltrate buildings through ventilation systems, open doors and windows, but there are numerous indoor pollutants. Formaldehyde, a gas released by many building products, is used as a flame retardant in furniture. It can be inhaled, particularly when furniture is new, and pass into the bloodstream through contact with formaldehyde-treated furnishings.

The situation is only going to worsen if the UK leaves the EU and leaves behind its ambitious environmental standards. The government’s proposed Environment Bill promises that an environmental watchdog will be established post-Brexit. However, the new agency will lack legislative powers and theDraft Bill excluded climate change and indoor air pollution from its remit.

That’s why my Clean Air Bill requires the UK to keep our environmental standards in line with those set by the EU.

The EU commission is reviewing the Ambient Air Quality Directive and is likely to lower the legal limit of NO₂, the main component of nitrogen dioxide pollution, currently 40μg/m³, to below 20μg/m³. A new, lower limit will be set in 2030, the World Health Organisation has recommended.

Clean Air Bill Jean-Claude Juncker, the President of the European Commission, has set the target of making the EU carbon-neutral by 2050. The UK has proclaimed net zero emissions by 2050, but the British government’s proposed Environment Bill is woefully short of what is needed to protect public health.

Calor is one of the leading firms in the under-pressure gas grid industry, but we are not immune to rising energy costs and the pressure of customers to switch to cleaner fuels.

The EU and the UK have set ambitious targets to reduce our dependence on fossil fuels, including heating oil and coal, by 2050. We are committed to help our customers, and the UK government, to achieve their energy efficiency and net zero targets.

There is a lot at stake. For Calor, this means we have to ensure we are playing our part by leading the way in encouraging our customers to make the transition to cleaner fuels.

The Calor team is working with the CCC to develop a Net Zero Energy Efficiency Plan to help us meet our targets. Calor has already introduced BioLPG and is working on the introduction of other low-carbon products. However, there is much more to do.

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AN INTERNATIONAL PROBLEM

Air pollution doesn’t respect national boundaries

Karimenu Vella, European Commissioner for Environment, Maritime Affairs and Fisheries

Air pollution is a global threat. Often it is invisible, and the costs are sometimes hidden, but there is no doubting the reality of its effects. According to the World Health Organisation, nine out of 10 people on the planet regularly inhale high levels of pollutants. In the European Union, including for the moment the UK, more than 400,000 premature deaths a year are attributable in part to air pollution. It brings chronic and serious diseases such as asthma, cardiovascular problems and lung cancer. Society pays an exorbitant price for this polluted air—around €24bn per year in the EU, not counting the impact of illness and premature death, and ignoring the impact on nature.

These figures can seem abstract, but cases such as the tragic loss of Ela Kiss-Debash to a rare form of asthma, and the tireless campaigning of her mother Debrah to a rare form of asthma, and the tireless campaigning of her mother Debrah to accountability in her place of residence, can protect its people. We would do well to remember that air pollution ignores political boundaries and national borders. It is in these urban areas that we can find solutions for improving not only the environment but also the health of our citizens. Revamping public transport systems or replacement of inefficient boilers can lower emissions of air pollutants.

Similarly, low-emission zones can help solve air quality problems, but we also know that such measures—if not phased in smoothly or communicated well—can cause concern, as citizens worry about losing comfort or mobility. These concerns need careful consideration, and solutions may need time.

Still, we should not fool ourselves: a child with a respiratory illness today will receive scant comfort from a promise that her air will be clean enough to breathe in 15 years’ time.

Success depends on an adequate contribution from all. That usually implies reducing emissions from a range of sectors, including transport, energy and agriculture. It means more integrated policy-making, with a view to not only meeting the clean air challenge but also improving mobility, and delivering better systems to deliver an urban climate and energy objectives as well.

Sometimes that wake-up call needs to come from Europe. When member states repeatedly fail to meet their commitments under EU law, the Commission will intervene. A failure to protect citizens from dangerous exposure can culminate in a referral to the Court of Justice, with the looming possibility of fines. At the time of writing, the Commission has infringement cases open at various stages against 20 member states for shortcomings regarding air pollution.

EU legislation is mature, it undergoes constant improvements, and a thorough evaluation of the main air quality framework is now being undertaken. If the laws are not respected and properly implemented, they will not deliver the promised results. The price of failure is paid by citizens and the environment, and that’s why the Commission continues to intervene.

Many solutions to this are ready and waiting: it’s time to scale them up and make them the norm. It is time to implement them across the EU to the benefit of the half billion European citizens—including, at the time of writing, Britons.

As so often, change comes down to political courage. That is how Europe can protect its people. We would do well to remember that air pollution ignores national borders.

Clean Growth Strategy: how can we decarbonise the countryside?

BioLPG is a low carbon, drop-in alternative

BioLPG is created from renewable and waste materials...

Most off-grid heating emissions currently come from kerosene oil and coal

Renevable BioLPG supply can rise over time as the number of sources increases

BioLPG and gas heating technologies can drastically cut emissions from rural properties in the long term without breaking the bank

What should the Government do?

Continue with plans to phase out the use of high carbon fossil fuels used in off-grid Britain during the 2020s i.e. heating oil and coal

Promote the role of clean gas and explore opportunities with industry for domestic production sources for biogases such as BioLPG

Reform EPCs to ensure rural property owners are no longer disadvantaged by government energy efficiency policy

www.calor.co.uk