GREENER VISION

Pathways to Net Zero

GREENER VISION | Pathways to Net Zero

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Achieving the target will require new thinking, creative solutions and systemic change.

Preamble

Our world is on fire. 2024 was the hottest year on record. UN Secretary General Antonio Guterres describes extreme weather as "the new abnormal, tearing through economies, widening inequalities, undermining the world's Sustainable Development goals and killing people"[1].

Our response to the climate crisis falls far short of the scale of the challenge. Public concern about climate change is consistently high[2] but implementing policies can be difficult. Very little progress has been made in sectors where people are required to make changes in their own lives.

Transport is the UK's most polluting sector. This report draws on extensive work to identify what would be a credible, politically deliverable framework for decarbonising transport. I would like to extend my sincerest thanks to the Foundation for Integrated Transport for providing grant funding to support this work since 2021.

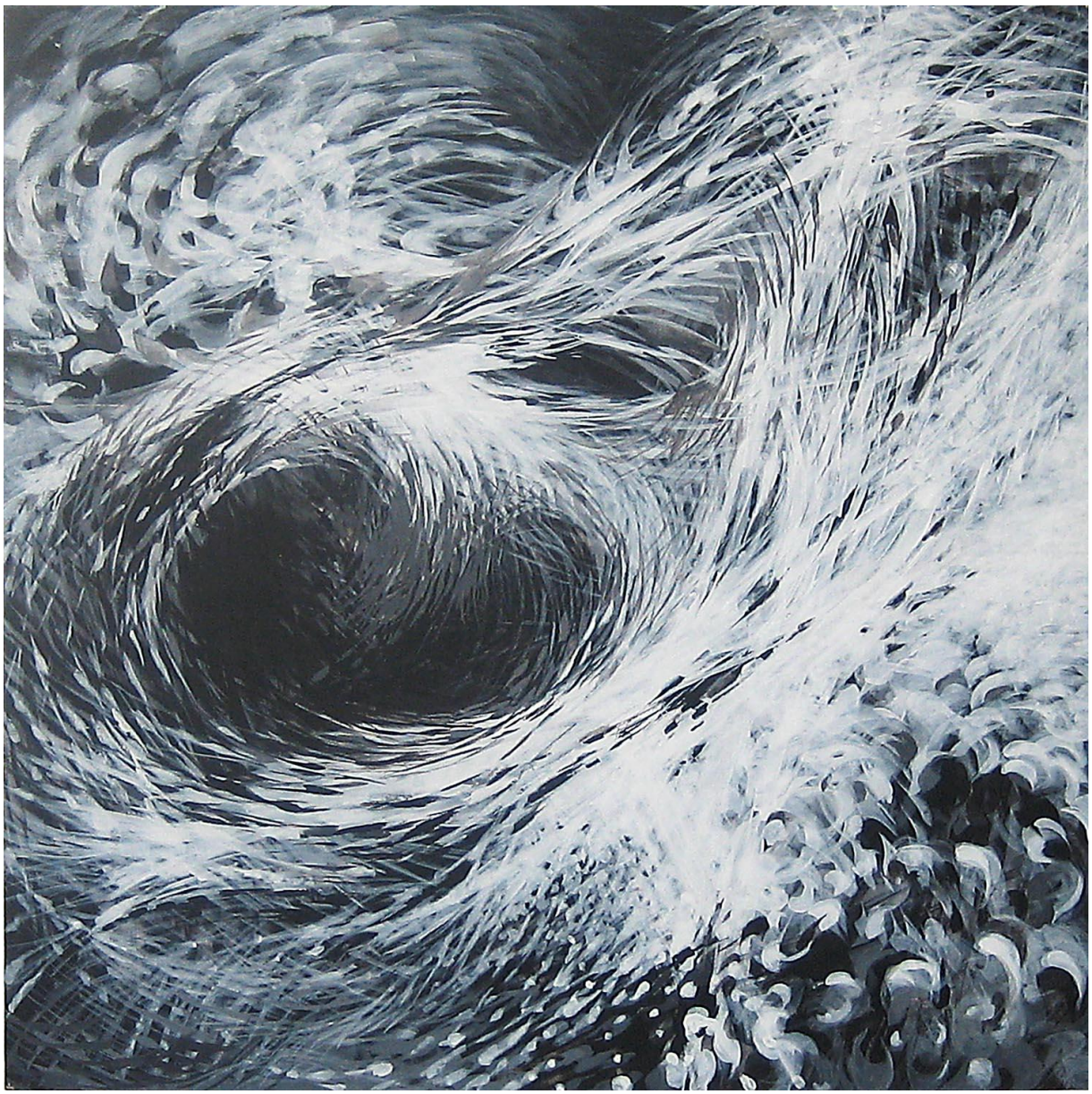
How can we approach climate policy differently? How can we prevent short-term thinking and political expediency from driving critical decision making?

The report also builds on key insights from The Tabula Project[3] a 30-year creative endeavour that started with the assumption that we won't solve our most intractable problems with the same thinking that created them. The related report 'The Art of Seeing'[4] recommends a more open and self-reflective approach, starting with an honest appraisal of how we look at the problem.

The climate crisis calls for leadership, political consensus and unprecedented levels of cooperation. To achieve real and lasting change, we must start with ourselves.

Claire Haigh
Founder & CEO, Greener Vision

22nd April 2025



The Collapse of the Wave Function, 2006-7, Acrylic on board, 92cm x 92cm

Executive Summary

"Our future is unwritten. It will be shaped by who we choose to be now".
Christiana Figueres & Tom Rivett-Carnac[5]

Efforts to tackle climate change are moving into a critical phase. 2024 was the hottest year on record. Global average temperatures hit 1.55°C above the pre-industrial average.[6] Far steeper global greenhouse gas (GHG) emissions reductions are required to avert a future dominated by catastrophic impacts.

At a time of heightened geopolitical tension and uncertainty it is vital that we maintain momentum for net zero. Transport is the most polluting sector. The biggest barriers to progress are political.

The world needs to deliver drastic GHG emissions reductions at a time of huge challenges. The old underpinnings of the world economy are being replaced by extraordinary levels of volatility and confusion. Conflicts in Ukraine and the Middle East are having a direct impact in the form of rising energy bills, higher prices and growing business anxiety about the security of supply chains.

Millions of people are struggling with the fatal impacts of worsening extreme heat, which is harming economies, widening inequalities and undermining the world's Sustainable Development goals.

Our dependence on fossil fuels exacerbates the existential threat of climate change and exposes us to ever increasing risks.

A decisive shift to energy demand reduction is needed. The International Energy Agency describes energy demand reduction as "the first fuel" supporting the goals of energy policy: security, affordability and sustainability[7].

In 2019, the UK led the world's major economies in setting a target of net zero GHG emissions by 2050. In a welcome demonstration of climate leadership, Prime Minister Keir Starmer committed the UK to an enhanced emissions reduction target of 81% by 2035. The government's plans for a clean power system by 2030 are ambitious, but they are gaining respect and attention on the world stage. The new Industrial Strategy could offer fresh opportunities for businesses to seize the immense global opportunities from the net zero transition.

However, UK emissions will need to reduce much more rapidly if the targets are to be achieved. UK is not on track to achieve the 2030 goal of a 68% emissions cut.

The biggest barriers to progress on tackling climate change are political not technological.

Little progress has been made in sectors where people need to make changes in their behaviour. The easy wins in terms of decarbonising the power sector have happened, and as it becomes clear that net zero will be disruptive to the status quo, the once strong UK political consensus looks increasingly less solid.

Policy certainty and consistency is critical to maintain business and public support for net zero. The rollback in September 2023 on the 2030 ban on sales of new petrol and diesel cars and vans was highly damaging for UK industry and undermined public confidence. It is critical for investor confidence that once targets are set, they are maintained. Green finance is a vital enabler of the transition.

Net zero must be presented as an opportunity to build a greener, more efficient transport system that will drive prosperity for everyone.

An ambitious industrial strategy would act as a catalyst for new technologies and innovation and bring jobs and manufacturing to the UK. The Energy and Climate Intelligence Unit (ECIU) has shown that the UK's net zero economy now generates £83.1 billion in Gross Value Added (GVA) and has grown 10% in the past year.[8]

Four out of five people in the UK are concerned about climate change[9]. There was a previously a strong cross-party consensus on climate change in the UK, but this has been undermined by the growing popularity of Reform UK. There is a risk that party politicking will undermine public support for net zero. In March 2025, Kemi Badenoch dropped her party's commitment to reaching net zero by 2050, launching the Conservative's "widest policy review in a generation."

Transport is one of the hardest sectors to decarbonise and is the largest emitting sector of the UK economy. Transport contributes around a quarter (26%) of total UK emissions.[10] The Climate Change Committee (CCC) has concluded that the annual reduction in surface transport emissions across the rest of this decade will need to be more than four times the small (0.9%) reduction in 2023.[11]

There is potential to deliver significant savings by reducing energy demand, but politicisation can hinder the transition. Road pricing is a case in point. We need a cross-party agreement to look at new ways of paying for road use. Such a dialogue will only become more urgent as the fleet electrifies and receipts from fuel duty disappear. If we do nothing about the existing cost structures, we are baking in rising traffic growth and congestion and a £35 billion[12] fiscal back hole.

The switch to electric vehicles (EVs) presents a once in a generation opportunity to change how we pay for road use and the time has come for an honest national conversation about the role of pricing in encouraging greener travel. But the politics make this deeply problematic.

Our current world is unsustainable. What are the building blocks of a new framework that would enable us to rise to the challenge and deliver a requisite response to the climate crisis?

Existing government policies for transport decarbonisation focus on replacing the internal combustion engine with zero emission technology. More than one million EVs were on UK roads in 2024[13]. However, a technology-led approach has delivered little overall progress. Since 1990 emissions from road transport, which accounts for 95% of the UK's transport total, have remained largely unchanged.

Progress to improve the efficiency of new vehicles has been offset by increased demand and the trend to larger vehicles, rebound effects. We need a **whole systems approach** to transport decarbonisation that reflects the shift to digital connectivity and the integration of transport with land-use planning, energy, green finance and the trip-generating sectors such as health, education and employment.

We must **reduce energy demand**. We must accelerate the transition to zero emission vehicles and decarbonise existing fleets, but we must avoid rebound effects. We must reduce the need for travel and ensure that good sustainable travel options are available. Focus is needed on traffic reduction and delivering modal switch for passengers and freight.

We won't get all the decisions coordinated across the economy the right way unless we **price properly for carbon**. Prices and taxes should incentivize lower carbon choices, but policy must be designed to ensure a fair distribution of cost and incentives. We must **ensure a fair and just transition** to net zero. Targeted support should be provided for low-income households. Policy must be designed to ensure that SMEs are not penalised. A long-term skills and retraining strategy is needed.

Finally, we must **strengthen delivery of net zero across the UK**. More progress can often be made through place-based solutions as it is easier at a regional level to break down silos and develop integrated strategies for transport, housing, skills and economic development. Government should enable all local areas to plan and invest on an integrated long-term basis. Consistent policy direction and messaging are also needed. There can be little prospect for any radical divergence in approaches to traffic levels locally if there is no commitment nationally.

The urgency of the climate problem requires strong political leadership. It is difficult for local leaders to go against the grain of the national stance. Current policy developments including the new focus and direction for devolution and the National Integrated Transport Strategy are encouraging. However, the signs are that an historic opportunity to change how we pay for road use will not be grasped.

Public buy-in for climate policies is essential. We need an informed national public conversation.

Decarbonisation will require a decisive shift away from a car-based culture. It is important to get the tone of the net zero discussion right. Cost and convenience are still the key deciders of how to choose how to travel. We need to be both aspirational and transactional. A narrative of doom and gloom is depressing and disempowering. Linking the narrative on net zero to the public health emergency of air pollution resonates with the public.

We must avoid polarization and ideological thinking. This is seen in local transport debates. The disbenefits of car dependency are clear but too often the debate is centred on cars being 'good' or 'bad' and becomes alienating. The problem is not the car but too much car *use*. How can you encourage people to change their behaviour when they don't have any other choices available to them?

Choice architecture often makes it too easy just to drive rather than travel by public transport, i.e. car parked outside one's house. We need to understand why people depend on their cars. The language of sacrifice won't win public support. We must change the story from "travel less" to "lead a better life without needing to move around so much". A positive vision is needed to overcome the forces of NIMBYISM

We need narratives based on cooperation that invite us to accept our personal responsibility. Progress depends on enabling people to act together. People are often "locked in" to unsustainable consumption patterns through perverse incentives, economic constraints, institutional barriers or inequalities in access that actively encourage unsustainable behaviours. We must prioritise cooperation.

A coherent policy framework that provides a contract for shared participation is needed.

People will willingly shoulder a burden – even one that requires short term sacrifice against uncertain long-term threats – provided they share a common purpose and are rewarded with a greater sense of social belonging. However, they require proof that others are contributing before they themselves will act.

Political expediency won't get us to net zero. The reasons for climate policies are as important as the policies themselves and need to be communicated clearly and consistently. Otherwise, politicians will struggle to gain the mandate they need to take difficult future decisions. If the public does not trust proposed policies, it can lead to a backlash and jeopardize the success of the net zero transition.

People need to be appealed to as citizens rather than consumers and encouraged to **do the right things for the right reasons**. Co-creation is important. Solutions are more likely if climate change is seen as a collective problem. We should seek to promote intrinsic and "bigger than self" values, and to foster the understanding that protection of nature is "protection of our very selves"[14].

We need to think and act in a global context for the long term.

The cumulative impact of decisions made for short-term self-interest is putting huge strain on our ecological system and leading to irreversible changes. We are wired to focus on immediate self-interests. The result is a lack of systemic wisdom. The key principle for moral and practical reasons should be "equitable access to sustainable development", with wealthier countries decarbonising more quickly than poorer ones.

We must put an end to economic short-termism. Climate change should be framed in terms of the management of immense risks and that delay is dangerous. The pandemic demonstrated the unpreparedness of the global economy to systemic shocks, despite early warnings from scientists. One legacy should be an increased focus on risk and resilience in appraisal and investment decisions. Solutions must have global equity and social justice at their heart.

Too often we focus on the wrong targets. Greater emphasis should be given to co-benefits such as improving health and well-being, enhancing bio-diversity, creating jobs, reducing poverty, stabilising the economy, and increasing resilience and the ability to adapt to climate change. In transport appraisal we should move away from a predominant focus on time savings to prioritising the key outputs of a sustainable economy such as better integration of housing, jobs and transport.

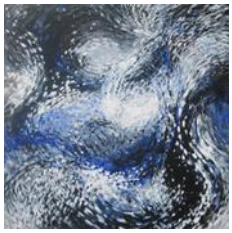
Climate change is the ultimate betrayal of intergenerational equity "imposing costs on future generations that the current generation has no direct incentives to fix."[15]

Mark Carney warns of the 'tragedy of the horizon' in which the catastrophic impacts of climate change will be felt beyond the traditional perspectives of businesses, investors, politicians and central bankers. Once the physical effects of climate change become the defining issue for policy makers it could be too late to stop their catastrophic effects.

What are the foundations of a new economic paradigm that would equip us to respond properly to the climate crisis?

We need to use our ingenuity and creativity to develop economic templates that shrink the world's carbon footprint without also shrinking our quality of life. A fair and just transition must be at the heart of change. We should prioritize growth according to its contribution to the Sustainable Development Goals rather than strictly linear GDP. These 17 interconnected goals aspire to sustainably increase global prosperity, equality and well-being.[16]

Pricing properly for carbon is a fundamental building block but ensuring a fair and just transition is about recognising the inequalities these measures can create and addressing them. How can we use carbon pricing as an instrument whilst ensuring that the transition to net zero avoids inflicting hardship on low-income households? The overall impact of a carbon tax doesn't need to be regressive as its revenue can be returned to households in ways that promote progressivity.



Our social and economic structures are a product of our way of thinking. Systemic change is a deeply personal endeavour. To achieve real and lasting change, we must start with ourselves.

"The unexamined life is not worth living".
Socrates[17]

Firstly, we should seek **to see the whole picture**. Too often the lens through which we perceive is faulty. We need to become more honest and self-aware about our decision-making. How we think is inextricably linked to our history and sense of identity. Are the assumptions underpinning our response to the climate crisis fit for purpose? We are part of the problem if we persist with the illusion that 'business as usual' will achieve net zero.

We need to find ways effectively to engage our emotional brains in climate change. Rational scientific data loses out against a compelling emotional story that speaks to people's values. **Integration of thoughts and feelings** will be critical. Much of the way we live has been designed using an outdated model of how humans think, feel and behave. The division between the rational and emotional brain runs deep in our society and culture.

We need a radical realignment of how we perceive ourselves in relation to the environment on which we depend. We must strive **to be at one with nature**. Climate change exposes the shortcomings of a rationalist view of the world which has created economic systems which unsustainably plunder finite resources. We need fairer and more equitable systems that allow humans and the environment to thrive. This will challenge some of the predominant forms of consumerism.

Too much attention is given to treating symptoms and not enough to the system. We need a whole systems transition to net zero. **Healing the whole system** means addressing root causes of climate change: our addiction to fossil fuels. Pricing properly for carbon is a fundamental building block. Failure to price properly for carbon supports unsustainable levels of consumption and grossly inefficient and counterproductive fossil fuel consumption subsidies.

Climate change is a global intergenerational problem requiring unprecedented levels of cooperation. We should strive **to become citizens of 'One World'**. We need to connect with our natural empathy and respect for each other and all living species. This requires us to avoid polarization and ideological thinking and seek instead to promote intrinsic and 'bigger than self' values. Climate change is one issue that could bring us together and help us overcome our historic divisions.

At a time of severe strain on the public finances, rising geopolitical tensions and uncertainty, and with the country facing protracted cost-of-living and energy crises, the UK's commitment to net zero must remain unequivocal.

The rise of populism threatens an erosion of public debate and our capacity to make difficult decisions. Politically unpalatable choices are avoided, and across the world we are witnessing a growing backlash against green policies. It is more important than ever that we make the case for the net zero transition.

The UK has a strong track record on this agenda. There is no realistic alternative to accelerating a full transition to a net zero economy. This is our best and only chance for a cleaner, fairer, safer future.

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THE PILLARS OF UNITY

I. **Seeing the whole picture**
II. **Integrating heart and mind**
III. **Being at one with nature**
IV. **Healing the whole system**
V. **Becoming citizens of 'One World'**

THE PILLARS OF UNITY SERIES

Greener Vision is running a series of discussions and events to explore how to develop a response to the climate crisis that is commensurate to the scale of challenge. 'The Pillars of Unity' series will explore how we might embrace more holistic thinking and develop an approach that creates unity rather than division. If you would like to receive information on the series, please sign up here.

THE CLIMATE IMPERATIVE

"Climate breakdown has begun. Scientists have long warned what our fossil fuel addiction will unleash. Our climate is imploding faster than we can cope, with extreme weather events hitting every corner of the planet."[18]

UN Secretary General Antonio Guterres

We're at a critical moment in humanity's efforts to tackle climate change. The UN World Meteorological Organisation has confirmed 2024 as the hottest year on record. Global average temperatures hit around 1.55°C above the pre-industrial average, outstripping even the record heat of 2023.[19]

The late Pope Francis said "If we took the planet's temperature, it would tell us that the Earth has a fever. And it is sick." Extreme weather, record breaking heatwaves, lethal flooding, wildfires and typhoons are now the deadly norm. Millions of people are struggling with the fatal impacts of worsening extreme heat, which is harming economies, widening inequalities and undermining the world's development goals. Migration patterns are set to rise as more parts of the world become uninhabitable.

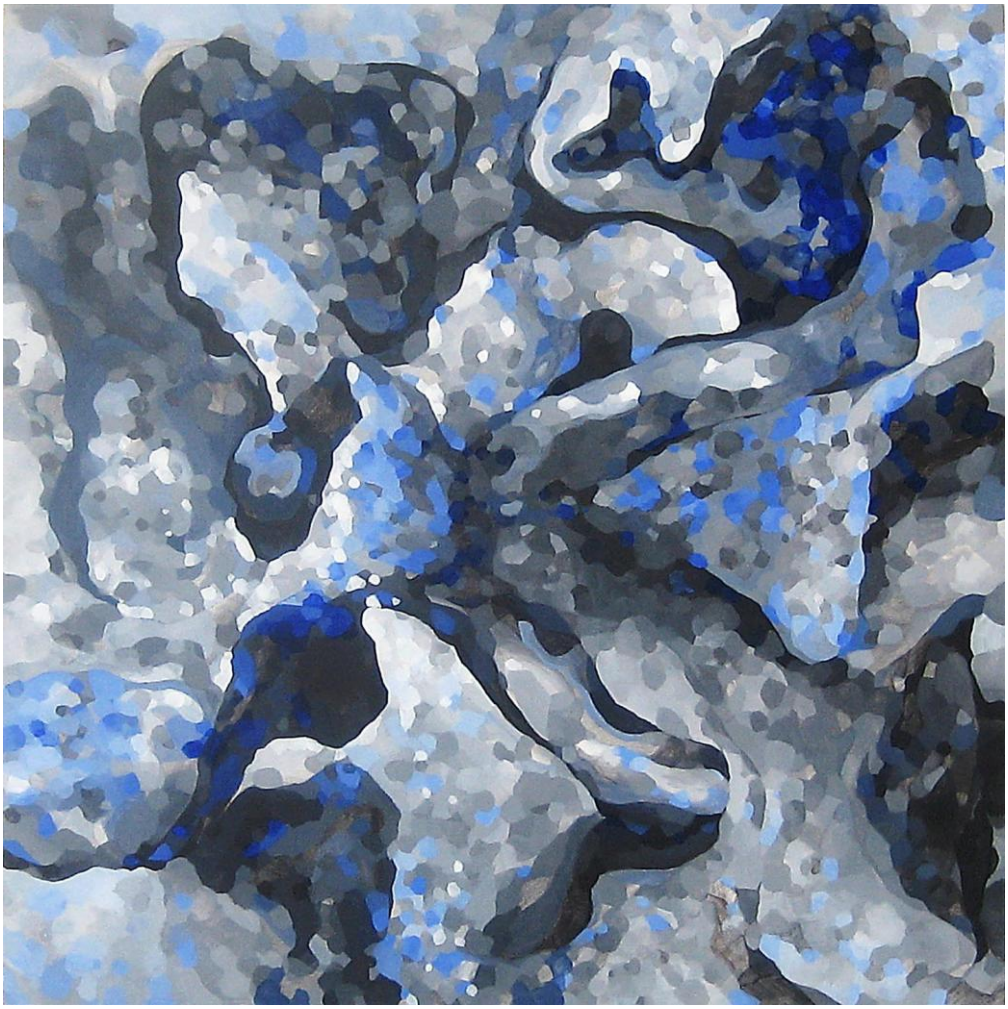
The catalogue of human tragedy grows longer. An intense heatwave in Asia, ruining crops and claiming lives. Powerful storms in the United States, bringing widespread destruction and havoc. Devastating droughts across southern Africa. Deadly floods and storms affected more than 400,000 people in Europe in 2024[20] and we all pay the costs of climate chaos in disrupted supply chains and rising prices.

The UN's first comprehensive stocktake of global efforts to limit warming concluded that the world is headed for a temperature rise of up to 2.6°C[21]. Climate Action Tracker puts median temperature rise on track for 2.7°C by 2100 if current policies continue[22]. Yet there is still no sign that the world has reached a peak. An increase in greenhouse gas emissions of 0.8% is projected for 2024.[23]

The window for meaningful change is rapidly closing.

A shift towards energy demand reduction is urgently needed. The Intergovernmental Panel on Climate Change (IPCC) calculate that reducing energy demand across all sectors could deliver a 40-70 per cent reduction in global GHG emissions by 2050[24]. The IPCC have called for the "mainstreaming of climate action across society."[25]

The world must step up its efforts. Crucially, we have the tools we need to halve emissions this decade and get on track for 1.5°C.[26] Far steeper emissions cuts are needed to avert a future dominated by catastrophic climate impacts, devastating human suffering and an increasingly uninhabitable world.



The Edge of Chaos, 2006-7, acrylic on board, 92cmx92cm

PART ONE: Current State of Play

I. A fast-changing world
II. The need for policy consistency
III. Time for action
IV. The UK's most polluting sector
V. The biggest barriers to progress

1.1 A fast-changing world

We are living through a period of heightened geopolitical tension and uncertainty. Our dependence on fossil fuels exacerbates the existential threat of climate change and exposes us to ever increasing risks.

The world needs to deliver drastic GHG emissions reductions at a time of huge challenges and complexity. The world order is going through a process of being upended through an assault on free trade, a shift to tariffs and the dismantling of security assumptions that have underpinned relative world stability since the end of the Second World War.

We are living in a "VUCA world": a period defined by volatility, uncertainty, complexity and ambiguity[27]. Wars, political instability, geopolitical tensions, environmental and climate breakdown all have implications for the global net zero transition.

Conflicts in Ukraine and the Middle East are having a direct impact in the form of rising energy bills, higher prices and growing business anxiety about the security of supply chains. The stranglehold that dependency on Russian gas holds over NATO member states underlines the imperative that we reduce our dependency on fossil fuels.

The International Energy Agency describes energy demand reduction as "the first fuel" supporting the goals of energy policy: security, affordability and sustainability[28].

The environmental think tank Carbon Tracker has revealed that political changes following the election of Donald Trump and the energy crisis resulting from the war in Ukraine have accelerated a shift among major oil and gas companies away from global climate goals.[29] Notably the Net-Zero Banking Alliance, launched as part of the Glasgow Financial Alliance for Net Zero, has recently dropped mandatory alignment with the 1.5°C target[30].

However increasingly stark warnings are coming forward from the insurance industry. The climate crisis is "on track to destroy capitalism"[31] as the world approaches temperature levels where insurers will no longer be able to offer cover for many climate risks. Aviva has said extreme weather damages for the decade to 2023 hit $2tn[32], while GallagherRE said the figure was $400bn in 2024[33]. Zurich said it was "essential" to hit net zero by 2050[34]. The global economy could face 50% loss in GDP between 2070 and 2090[35].

A human behavioural crisis is at the root of climate breakdown[36]. Emissions need to plummet by 43% by 2030 to stave off the worst impacts of climate change.

Humanity would currently need 1.7 Earths to maintain consumption of resources at a level that the planet's biocapacity can regenerate.[37] Unless demand for resources is reduced, most climate solutions just tackle symptoms not causes. Climate breakdown is a symptom of ecological overshoot which is caused by the deliberate exploitation of human behaviour[38].

The UN Emissions Gap report for 2024 finds that nations must deliver dramatically stronger ambition and action in the next round of Nationally Determined Contributions or the Paris Agreement's 1.5°C goal will be gone within a few years. It remains technically possible to get on a 1.5°C pathway, but G20 nations, particularly the largest-emitting members, "would need to do the heavy lifting."[39]

1.2 The need for policy consistency

Policy certainty and consistency is critical to maintain business and public support for net zero. Green finance is a vital enabler of the transition. It is essential for investor confidence that net zero targets are maintained.

The UK led the world in 2019 in setting a legally binding target for net zero greenhouse gas emissions by 2050, with interim targets for 2030 and 2035. These include a 65% reduction by 2030 and a newly increased target for an 81% reduction by 2035, relative to 1990 levels. Overall, UK GHG emissions have halved since 2008, mainly due to the decarbonising the power sector.[40] However, the UK is not on track to reach its target for 2030.

Emissions will need to decline much more rapidly during this decade. Little progress has been made in sectors where people need to make changes in their behaviour. The easy wins have happened and as it becomes clear that net zero will be disruptive to the status quo, the once strong UK political consensus looks increasingly less solid.

The net zero transition is not optional.

Most businesses recognize that future planning is impossible without alignment to net zero goals. It has been clear ever since Lord Stern's review in 2006 on the economics of climate change that delaying investment will make it more expensive in the long run.[41] Every year that we fail to deal with it sufficiently signifies a steepening of the curve. The more we delay, the more the transition is going to cost, and the more adaptive measures will be needed.

However, it is critical for business and investor confidence that once targets are set, they are maintained. The decision by the previous UK government to rollback some of the UK's biggest net zero commitments[42] was widely criticized by businesses for putting the UK's future economic prosperity and energy security at risk and increasing costs of meeting net zero[43]. Investors warned that the sudden changes would damage inward investment[44].

The rollback on the 2030 ban on sales of new petrol and diesel cars and vans was highly damaging for UK industry. Vehicle manufacturers remained subject to a strict ZEV mandate but the message to consumers was "don't worry, you can wait before you purchase an EV". The current government has amended ZEV mandate to support manufacturers. Importantly, the updated mandate keeps the 2030 end date but adds flexibility for hybrid models and the credits generated through the scheme.

The risk that party politicking will undermine public support for net zero.

In March 2025, Kemi Badenoch dropped her party's commitment to reaching net zero by 2050, launching the Conservative's "widest policy review in a generation." Eight out of 10 people in the UK are concerned about climate change[45]. The challenge comes in the implementation of policies that might be seen as unfair, costly, or overly burdensome. Failure to inform and engage the public on the climate crisis could result in a 'vocal and unrepresentative minority ' undermining net zero goals[46].

Research for Green Alliance in April 2025 offered a clear message for policymakers: Voters are not turning away from climate action. While public concern about energy bills and security is real, there is broad political space to advance environmental policy, provided it is framed with care and grounded in the economic and social benefits it can deliver.[47]

1.3 Time for action

Maintaining momentum is a key priority. Net zero must be presented as an opportunity. An ambitious Industrial Strategy should act as a catalyst for new technologies and innovation and bring jobs and manufacturing to the UK.

The UK has a strong track record on climate leadership. The Climate Change Act of 2008 was the first ever of its kind, and we were the first major economy to commit to Net Zero by 2050. Businesses have responded because market signals have been clear. The UK can boast of world leading growth in offshore wind and green energy.

However, the UK is not on track to reduce emissions in 2030 by 68% and is now being outpaced by international competitors. A race is on to win the new green industries. Hugely consequential decisions are being made by the US, EU and China. In spite of recent announcements, it is unlikely that Trump will derail the transition in the US.

More must be done to anchor the supply chain in the UK, and it's not just investment that's needed. A long-term vision and a strategy to reduce the cost of investment and underwrite risk is needed. The signs are that the Starmer Government grasps this opportunity. It is hoped that the new Industrial Strategy will offer big opportunities for businesses

The UK must move fast to seize opportunities presented by the net zero transition.

Net zero is an opportunity to drive economic growth and create new job opportunities. The Energy and Climate Intelligence Unit (ECIU) has shown that the UK's net zero economy now generates £83.1 billion in Gross Value Added (GVA) and has grown 10% in the past year. The sector has a strong multiplier effect, with every £1 of value generated by the net zero economy creating an additional £1.89 in the wider economy.[48]

ECUI shows that employment within the sector has also seen significant growth of 10.2% over the past year[49]. Bain and Company estimate that by the end of this decade 200,000 new roles will be created by the drive to decarbonise transport.[50] McKinsey has estimated that supplying the goods and services to enable the global net zero transition could be worth more than £1 trillion to UK businesses between 2021 and 2030.[51]

To maintain momentum for net zero it is vital to communicate the benefits.

Net zero should be presented as an opportunity to build a greener, more efficient transport system that will drive prosperity for everyone. Green growth is the only sustainable kind of growth. A key lesson from the war in Ukraine is the importance of energy independence, investment in renewables and energy infrastructure. Cutting traffic congestion would tackle a £30 billion a year deadweight on the UK economy[52].

There are also benefits for public health and quality of life. The shift to electric vehicles and the reduction of diesel buses has led to lower levels of nitrogen dioxide and particulate matter in urban areas. By promoting active travel and reduced car dependency, people in urban areas can enjoy less congestion, lower noise pollution. The net zero transition will mean cleaner air, better public health, reduced congestion, more equitable access, improved public transport and enhanced energy security.

1.4 The biggest polluting sector

Transport is one of the hardest sectors to decarbonise, and where the least progress has been made. Since 2010, transport related global GHG emissions have increased faster than any other end-use sector.

One of the UK Government's missions is to make Britain a clean energy superpower. This is welcome, as are their plans for a clean electricity grid by 2030, and a new industrial strategy. However, much more must be done to decarbonise transport.

Transport is one of the hardest sectors to decarbonise. Since 2010 transport related global GHG emissions have increased faster than any other end-use sector, with road transport one of the fastest growing (+1.7% per year) among all global energy-using sectors.[53]

Transport contributes around a quarter (26%) of total UK emissions, making it the largest emitting sector of the economy.[54] Emissions from transport have remained stubbornly high, as vehicles efficiency gains have been largely offset by larger vehicles and rising demand. If current trends continue, Transport & Environment estimate that SUV registrations could make up 75% of new registrations by 2027[55].

The UK's predominantly technology-led approach has so far delivered little progress. The Greener Transport Council[56] convened by Greener Vision highlighted the need for traffic reduction. Motoring taxation should be reformed as we transition from petrol and diesel vehicles and a national programme for delivering behaviour change was needed[57].

Since 1990, emissions from road transport, which accounts for 95% of the UK's transport total, have remained largely unchanged. The pace and scale of action to mitigate surface transport emissions will need to increase substantially if the UK's net zero targets are to be met. In its latest progress report to Parliament, the Climate Change Committee (CCC) concluded that the annual reduction in surface transport emissions across the rest of this decade will need to be more than four times the small (0.9%) reduction in 2023.[58]

Surface transport offers big opportunities. A rapid, sector-wide transition to vehicles that produce zero tailpipe emissions and increased take-up of low carbon fuels, along with improvements in petrol and diesel vehicle efficiency, could make a substantial contribution to cutting emissions. If people also change their travel habits by driving less and using cleaner transport options, surface transport emissions could drop by 70% by 2035. [59]

The phase we are in is one of implementation and scale up.

Following an extensive consultation of its members in 2023, Zemo Partnership published a report highlighting that greater focus must now be given to the delivery of the UK's net zero targets[60]. Zemo is a public private partnership dedicated to decarbonising transport. Its membersship encompasses all forms of road transport, and all fuels and technologies.

To achieve the transition to net zero transport, businesses need long-term certainty to invest in low carbon technologies, infrastructure and fuels. This certainty relies on a stable and consistent policy environment, to include targets, funding and a clear regulatory framework[61]. Sudden reversals of policy can damage market confidence, as happened in 2023 with the rollback on the 2030 target dates for ending sales of petrol and diesel cars and vans[62].

1.5 The biggest barriers to progress

The biggest barriers to progress on climate are political not technological. A shift towards energy demand reduction is urgently needed but the potential impact on living standards means that implementation can be difficult.

There is potential to deliver significant savings by reducing energy demand, but politicisation can hinder the transition. Policy has been heavily skewed to technological solutions. The Climate Change Committee have criticised the government for continuing "to place their reliance on technological solutions that have not been deployed at scale, in preference to more straightforward encouragement of people to reduce high-carbon activities."[63]

The 'gilet jaunes' in France successfully mobilised against attempts to increase taxes on fuel. In Germany the Alternative for Germany party successfully mobilised against a push to require installation of heat pumps. A report in 2023 for the Green Alliance revealed "outright opposition" by some MPs to "the roll out of heat pumps or congestion charge zones", despite a general acceptance of net zero.[64]

The electoral cycle presents inbuilt challenges. Cross party consensus needs to be robust to overcome tensions between short-term electoral politics and long-term climate goals.[65]

A once in a generation opportunity to change how we pay for road use.

Ever since the fuel duty protests in 2000, and the referendums on congestion charging in Edinburgh and Manchester, levying any additional charges on road users has been seen as politically toxic. However, the switch to EVs is considered to be an opportunity to make a once in a generation change in how we pay for road use.

Speaking at a Greener Transport Solutions webinar in 2021[66] Chair of the Transport Select Committee Huw Merriman MP highlighted that the greatest challenge on net zero was political will. However, he believed that road pricing could play an important role, and that the UK could provide an example for rest of world, that if we are serious about net zero, as well as reducing obesity we have to embrace modal switch as well as electrification:

> ***"Successive Governments have shied away from road pricing, but this Government has set ambitious net zero targets, has support from the public on net zero delivery and is facing a looming fiscal black hole as the fleet electrifies and fuel duty receipts disappear. If we don't do it now, we never will."***
>
> *Greener Transport Solutions Webinar, September 2021*

Two years later, following the Conservatives unexpected victory in a byelection defined by a fight over expanding London's Ultra Low Emission Zone, the Prime Minister Rishi Sunak delayed key net zero targets[67]. The Conservative government's predominant narrative was on "ending the war on the motorist". Their Plan for Drivers included a clampdown on 20mph limits, bus lanes, low-traffic neighbourhoods (LTNs)[68].

The reversal of this direction of travel by the current government with its National Integrated Transport Strategy is much to be welcomed. However, the signs are that the road pricing opportunity will be missed. In October 2024 the Chancellor confirmed the freezing of fuel duty for another year as increasing the tax "would be the wrong choice for working people."

The Future is under Perpetual Construction, 2006-7, acrylic, 92x92cm

PART TWO: An Agenda for Change

I. A radical shift for decarbonising transport
II. Re-imagining our towns and cities
III. Winning hearts and minds
IV. Acting in a global long-term context
V. Building a new framework

2.1 A radical shift for decarbonising transport

"What would be a credible, politically deliverable framework for decarbonising of transport that would deliver the necessary emissions reductions in the shortest time possible whilst mitigating any negative social impacts?"[69]

Transport Knowledge Hub: Decarbonising Transport | 3rd March 2020

Existing government policies for road transport focus on replacing the internal combustion engine with zero emission technology. The roll out of electric vehicle (EV) car sales are starting to have a small positive contribution towards emissions reduction, with more than one million EVs on UK roads in 2024[70]. However, that is just 2.8% of the car fleet, and there are still too many gaps in policy for electrifying vehicles other than cars.

The adoption of zero emission technologies is essential for delivering net zero transport, but it is by no means sufficient.

There are problems with an approach that focuses predominantly on supply side measures with insufficient focus on demand side measures. The Transport Decarbonisation Plan highlighted that transport emissions were only 3% lower than they were in 1990[71]. Progress to improve efficiency of new vehicles has been offset by increased demand and the trend to larger vehicles, so-called rebound effects.

From the perspective of the businesses delivering net zero transport, Zemo Partnership has published a 'Delivery Roadmap for Net Zero Transport in the UK'[72] which focuses not only on accelerating the roll out of zero emission vehicles but also on decarbonising the existing fleet through greater use of low carbon fuels and on encouraging a greater take-up of sustainable travel choices. Key enablers include energy policy, green finance and a long-term skills and retraining strategy.

The question of a credible and politically deliverable framework for decarbonising transport was discussed at the Transport Knowledge Hub: Decarbonising Transport workshop. It was noted that a technology led approach had delivered little progress and greater focus should be given to traffic reduction. Digitalisation will increasingly drive the whole economy. We need a total reformulation of transport pricing, public and shared transport have a vital role, and we must reform the current appraisal system[73].

Building on these conclusions Greener Vision convened the Greener Transport Council[74] of leading academics and experts which called for a radical shift for decarbonising transport.

SEE ANNEX 5: <u>THE FIVE KEY PRINCIPLES FOR DECARBONISING TRANSPORT</u>

i) **We need a whole systems approach to net zero**
ii) **We must reduce energy demand**
iii) **We should price properly for carbon**
iv) **We must ensure a fair and just transition**
v) **We must strengthen delivery across the UK**

Towards a credible, equitable and politically deliverable framework for decarbonising transport that will deliver emissions reductions in the shortest time possible

> ***"There are essentially two broad ways to reduce transport emissions: the first, approach A, is to get rid of fossil fuels altogether in cars, planes, trains and buses; the second, approach B is to use these modes of transport less. The more you do of one the less you need to do of the other. Both ways of reducing transport emissions are a trade-off. Approach A is politically more acceptable than approach B."***
>
> *Professor Jillian Anable, Greener Transport Council*

The question of political deliverability goes to the heart of credibility. Professor Anable describes the above statement as being a helpful way to frame the question in Climate Assemblies. Her experience is that when you explain the trade-offs between A and B to the public they understand. However, the legacy of decades of car-centric planning mean that delivering approach B requires system wide changes.

We need a **whole systems approach** to transport decarbonisation that reflects the shift to digital connectivity and the integration of transport with land-use planning, energy, green finance and the trip-generating sectors such as health, education and employment. We must reduce the need for travel and ensure that sustainable travel options are available. Lack of joined-up policy making can undermine cross-government ambitions. A 'net zero test for public policy' would help ensure alignment

We **must reduce energy demand**. We must accelerate the transition to zero emission vehicles, but technical solutions alone will be insufficient. We must avoid rebound effects. and decarbonise existing fleets. Focus is needed on traffic reduction and delivering modal switch for passengers and freight to more sustainable transport. We must "sweat the assets" and reduce embedded carbon. We should minimise what we build and make much more efficient use of existing assets - such as increasing car and charge point sharing.

We won't get all the decisions coordinated across the economy the right way unless we **price properly for carbon**. Whilst prices and taxes should incentivize consumers to lower their carbon footprint, policy must be designed to ensure a fair distribution of cost and incentives. Pricing also generates revenues to mitigate negative social impacts. Personal carbon allowances should be explored. We need a national public conversation about how we might reform road taxation to encourage more efficient use of our roads.

We must **ensure a fair and just transition** to net zero. An equitable approach will be essential to maintain public support. EVs are likely to be bought by people on higher incomes, with off street parking. Targeted support should be provided for low-income households. Greater focus is needed on improving sustainable transport networks. Our current transport system is not fair. Over past 20 years the cost of motoring has fallen in real terms whilst the cost using public transport has risen.

Finally, we must **strengthen delivery of net zero across the UK**. Progress on net zero can be made more quickly through place-based solutions. It is easier at a regional level to break down government silos and develop integrated strategies for transport, housing, skills and economic development. Moving to more devolved long-term financial settlements for local authorities is a central priority. Government should enable all local areas to plan and invest on an integrated long-term basis.

There are clear opportunities to reduce emissions quickly by encouraging modal switch for passengers and freight.

The Climate Change Committee (CCC) has estimated that a modal shift to walking, cycling and public transport, an increased level of car sharing and higher behavioural change could result in a reduction in vehicle miles driven of 34% by 2050 relative to baseline demand.[75]

There have been some very encouraging recent policy developments. Government's plans for a new 10-year-long 'people-centred' Integrated National Transport Strategy (INTS) for England will seek to join up transport networks, empower local leaders and drive economic growth. Key themes include seamless integration: developing networks akin to Transport for London or Manchester's B network; encouraging sustainable travel: promoting public transport, walking, and cycling, while enhancing the experience for car users; and improving collaboration. INTS aims to create a "national vision of transport, but delivered by local people, where the power belongs".

This is all part of a major new focus and direction for devolution. The Devolution White Paper[76] aims for nationwide Mayoral Combined Authorities (MCAs) with enhanced powers covering transport, housing and skills. Simplified, multi-year funding will replace fragmented bidding processes. The focus is on strategic transport and planning integration, including expanded development powers for Mayors. Integrated Settlements have been awarded to West Midlands and Greater Manchester[77], and will be rolled out to further MCAs. More emphasis is given to sustainable transport and vision-led planning in the revised National Planning Policy Framework.

These are all very positive developments, but the scale of the challenge should not be underestimated. Historically, very little progress has been made on encouraging people to change their travel behaviour and reduce car journeys, and it should be noted that public transport patronage levels still lag behind pre-Covid levels[78].

Without the use of pricing or some other constraint it is difficult to see how significant modal switch on the scale required will be delivered. Moreover, simply replacing ICEs with EVs risks locking in car dependency. In lowering the cost of motoring, electrification will increase car use and congestion and make mode shift to public transport and active travel even harder to deliver. If we electrify the car fleet without sorting out how to transition away from fuel duty, road traffic could increase by an additional 30%[79].

2.2 Re-imagining our towns and cities

Decarbonisation will require a decisive shift away from a car-based culture, but discussion about local transport too often becomes alienating and self-defeating. A positive vision is needed to overcome the forces of NIMBYISM

Terence Bendixson wrote in 1974 that we use cars and trucks so much that "though they pinch like countless pairs of ill-fitting shoes we just shrug our shoulders. There seems to be no choice." He lists many problems with our car dominated society across a spectrum of safety, cost, congestion. "Anxieties and discomforts of this kind are typical symptoms of our times. They are warnings that something central to daily living is out of order."[80]

We need a vision for the future which can inspire local decision makers to create places free of congestion and pollution.

The disbenefits of our car dominated culture are well documented. Congestion is not just a constraint on growth it also worsens emissions. In nose to tail traffic emissions increase fourfold[81]. Air pollution largely from road traffic is linked to 40,000 early deaths a year[82]. Car dominated sedentary lifestyles are contributing to the obesity and loneliness epidemics. Damage to public transport networks has heightened social deprivation. A quarter of households and half of workless households have no access to a car. A 10% reduction in access to public transport is linked to a 3.6% increase in social deprivation[83].

Congestion Reduction in Europe: Advancing Transport Efficiency (CREATE) demonstrates the benefits of moving away from "car dominated" policy perspective to a "place-based" perspective, with greater emphasis on public realm, street activities and traffic restraint[84]. Density is key to supporting public transport. We need more vision-based planning with the provision of sustainable transport is factored in at the start of the process. 'Predict and provide' has been discredited as a strategy to reduce congestion[85]. Movement should be about providing access not maximising speed.

That the car fleet size has more than doubled since Bendixson's book was published is a salutary reminder of just how difficult it is to shift the predominant car-based culture. New housing developments regularly lock in car dependency.[86] Progressive moves towards better designed cities have been hijacked by debates on ultra-low emission zones and LTNs. However, the debate should be about what a "healthier city" could look like with safer streets for women, less traffic, accessible walking and cycling and better public transport.

Discussion about local transport too often becomes alienating. We need narratives based on cooperation that encourage us to accept our personal responsibility.

> ***"There is a risk of polarisation on the climate debate. We need to make sure we don't pour oil on the fire on issues that can become really divisive, such as LTNs. We need to bring people together. Co-creation is part of that. It takes longer but is well worth it."***
>
> *Pathways to Net Zero Roundtable: Behaviour Change April 2022*

Geroge Marshall contends that "enemy narratives" adopted by both environmentalists and climate deniers is not helpful to addressing the climate crisis. "The battle for mass action will

not be won through enemy narratives… We need to find narratives based on cooperation, mutual interests and our common humanity".[87] Nowhere is this polarisation more evident than in debates around local transport issues where there are high levels of car dependency.

The built environment has grown very slowly over the last 200 years based on ability to travel through it using fossil fuels. Nearly all trips have their origin and destination within existing built environment. Fossil fuel mobility has allowed large choices of destinations. If you shrink down to revert to village living what you lose are the choices people value. We are habituated to high levels of choice, and it is hard to pull away from that. However, too often debate is either on "ending the war on the motorist" or on how traffic is killing our towns and cities – on cars being either 'good' or 'bad'. This polarisation is killing the debate.

> ***"I think we have to accept that potentially, politically you could end up being sacrificed by the electorate if they don't like what you are doing. But doing the right thing has to be at the forefront of what we do and that's why we have stuck to our guns with regard to our Low Traffic Neighbourhoods (LTNs) and our interventions to deprioritise motorists' needs in favour of active travellers' needs…. It's difficult. It's always challenging but it's worth the fight because you see the benefits."***
>
> *Pathways to Net Zero Roundtable: Politics & Local Delivery, March 2022*

How do you encourage people to change their behaviour when they don't have sustainable transport options available to them? The problem is not the car but too much car *use*. We need to understand why people like and depend on their cars. The language of sacrifice won't win public support. We must change the story from "travel less" to "lead a better life without needing to move around so much".

Choice architecture often makes it too easy just to drive rather than travel by public transport i.e. car parked outside one's house instead of in a less convenient location***.*** "The way we start a journey by car has a disproportionately path dependent effect on rest of journey". We need a better understanding of biases in decision making and how to improve choice architecture to encourage behaviour change.

> ***"The really bad thing about the car is not the car itself, it's the fact that that once you own a car you become preternaturally reluctant to use any other form of transport… It's the effect that owning a car has on your subsequent behaviour that needs to be addressed."***
>
> *Pathways to Net Zero Roundtable: Behaviour Change, April 2022*

A positive vision is needed to overcome the forces of NIMBYISM

Speaking at a Greener Transport Solutions webinar[88], **Jamie Driscoll, Mayor of the North Tyne Unitary Authority**, argued we need a transport system based around people. This was also the central message of a blog he wrote for Greener Transport Solutions.

> ***"Imagine public transport so good that you'd rather not use your car."*** [89]

Speaking at a Greener Vision roundtable discussion[90] **Councillor Bridget Smith, the Leader of South Cambridgeshire District Council said**: "We need to build communities where not only is car ownership unnecessary, but it is positively undesirable". But to achieve this will need compelling narratives that invite us to accept our personal responsibility and embrace collective efforts. And we need to overcome the forces of NIMBYism:

> ***"Our experience is that everybody wants a new railway or an off-road bus route until it runs close to their homes. And everyone wants more buses but very few people will leave the comfort of their cars to use them. Everyone wants congestion to be reduced and air quality to be improved until they find out that road closures and congestion charging are the only ways to achieve that. And everyone wants more cycling and walking but they won't give up their road space and their car parks…***
>
> ***"So, in a nutshell, our experience is that NIMBYism is actually the biggest barrier that we face when trying to drive mobile shift to sustainable transport and zero carbon living."***
>
> *Pathways to Net Zero Roundtable: Politics & Local Delivery, March 2022*

The urgency of the climate problem requires strong political leadership.

Consistent policy direction and messaging from central government are needed. It is hugely challenging for local leaders to go against the grain of the national stance. There can be little prospect for any radical divergence in approaches to traffic levels locally if there is no commitment nationally.

Various policy levers can be used such as parking charges, congestion charging, LTNs, use of bus lane powers, Workplace Parking Levy (WPL), moving traffic offence powers and clean air zones. The tools might be there, but local authorities need incentives and political support. Consistency is needed with Clean Air Zones for example. Measures can be too easily politicised.

> ***"Cuts to Fuel Duty that hasn't even been raised in 12 years sends out really, really poor messages around this agenda. I would have thought cuts to bus fares would have been a lot better, cuts to rail fares would have been better. Bigger investment into active travel would have been better."***
>
> *Pathways to Net Zero Roundtable: Politics & Local Delivery, March 2022*

> ***"All our ambition to make things better is politicised by people with political mileage to make out of it…I'm pretty well sure I will lose my position because of the road pricing issue!"***
>
> *The Future We Want Roundtable, October 2022*

It is important to recognise the challenge for local leaders in delivering behaviour change. The sector also needs to do more to provide local leaders with the arguments and the evidence to sell solutions like WPL to their communities. They need to be briefed to put the points forward in such a way that will really sell the benefits. There needs to be greater focus on the co-benefits. Solutions that reduce carbon emissions from road transport can also help with tackling the cost of living, congestion, road safety and public health.

The case for sustainable transport needs to be presented as a common cause. Even where there is broad support for environmental policies there can be strong divergences in opinion, both at the level of local politics and civil society, about which solutions are needed. Local sustainable transport groups can be too focused on their specific transport mode. Conflicts emerge between for example "village green" greens who want to prioritize active travel and the scientific environmental planning type greens who see mass transit as essential.

2.3 Winning hearts and minds

Consumer engagement is a key priority for scaling up the transition. Do we need to be visionary or transactional? We must avoid polarization. A positive vision is vital to overcome it.

According to the Climate Change Committee, a third of the GHG emissions cuts needed by 2040 must come from consumers[91]. Very little progress has been made in areas where people need to make changes in their own lives. The UK is already badly off track to meet the current (fourth) carbon budget which runs to 2028.

Public buy-in for climate policies is essential. We need an informed national public conversation.

It is important to get the tone of the net zero discussion right. A narrative of doom and gloom is depressing and disempowering. Linking the narrative on net zero to the public health emergency of air pollution resonates with the public. There are many benefits to life beyond fossil fuels including cleaner air, better health, more connected communities and greater opportunities for all. What we need is a clear articulation of the future we want.

> ***"Not all environmental behaviour needs to involve sacrifice. So much of our transport is "performative", such as business meetings that we need to be seen to attend but which would be much better online. The greener choice is often the better choice".***
>
> *Pathways to Net Zero Roundtable: Behaviour Change April 2022*

We need to focus on what a sustainable *aspirational* lifestyle could look like and how we can sell this to the public. Young people are less focused on using material consumption as a measure of success. Life is becoming more digital and potentially that has fewer resource implications. We need a vision of the world we want which includes more than economic indicators. The language of sacrifice won't win public support. We must change the story from "travel less" to "lead a better life without needing to move around so much". What would a sustainable aspirational lifestyle look like?

Strong vocal public support for action will be critical to deliver the scale of change needed. We need a mixture of micro interventions improving local choices such as better walking facilities, implementing LTNs, and big-ticket items such as how pay for road use and how we pay for flying. Even though there was legislation, not smoking in public places and the mandatory wearing of seat belts didn't become normal until they became a social issue.

> ***"Is there any example out there of massive behaviour change that hasn't revolved around constraint and getting people to not do things? I struggle to think of one."***
>
> *Pathways to Net Zero Roundtable: Behaviour Change, April 2022*

The reasons for climate policies need to be communicated clearly.

Political expediency is self-defeating. Bateson argued that the reasons for ecological policies are as important as the policies themselves and these need to be communicated

clearly to people. Otherwise, politicians will struggle to gain the mandate they need to take future difficult decisions[92]. Rebecca Willis argues that 'stealth strategies', trying to substitute low-carbon behaviours for high carbon ones without people noticing, are inherently self-limiting as by definition they do not make the case for change.[93]

If the public does not trust proposed policies, it can lead to a backlash and jeopardize the success of the net zero transition. The 'gilet jaunes' movement in France is an example of how the public can react to measures it doesn't perceive to be fair. Green policies can also be very quickly politicised and blown up into black and white issues, as the political fallout following the expansion London's ULEZ demonstrated.

However, cost and convenience are still the key deciders of how to choose how to travel. We need to be both aspirational and transactional. IPPR deliberative research has found that people want jobs and access to things they care about; public transport that is affordable; safe streets for their children to get to school. We need to engage with people on the issues facing them and might not even have climate as a lead topic.

> ***"Individual behaviour change alone is not going to deliver decarbonisation. We need big ticket interventions from government. The importance of behaviour change is to create space for government to act. People's priorities are jobs, warm homes and to be able to get around."***
>
> *The Future We Want Roundtable, October 2022*

Solutions are more likely if climate change is seen as a collective problem.

There is a growing view that people should be at the heart of designing climate policies (Climate Assembly UK)[94]. Willis argues for a more deliberative model of democracy in which politicians, citizens and experts debate and collaborate on climate strategies. We need a clearer story of transformation if we are to transition away from a high carbon society towards a post-carbon future. And we need to acknowledge that climate change is about more than evidence and technical fixes, it is an appeal to the heart as well as head.[95]

> ***"People need to feel they have agency. There is currently a disconnect. People don't believe that there is much they can do, perhaps just cycle a bit more. They feel they have a low level of political efficacy, and don't think that they have the power to change things. They don't have high trust in our institutions, but they recognise that change needs to come centrally".***
>
> *The Future We Want Roundtable, October 2022*

Research commissioned in 2021 by BEIS and Defra found that people not only have a bias for the present but need to feel that their actions are meaningful, and are aligned with the actions of others, including both industry and other countries. It is important to focus on clear, shorter-term, manageable actions, and for feedback mechanisms to leverage social norms and rewards. There is an "imperative to have strong and united political leadership delivering a clear and consistent message on the actions that will get us to net zero".[96]

Tackling climate change is seen as a massive global issue. The research found high levels of scepticism from the public about the motivation and commitment of a range of stakeholders (e.g. energy companies, industry) to reaching net zero "Ultimately, people wanted net zero to be achieved in ways which respected individual choice and promoted

well-being, which were seen to be fair in their distributional impact, and which did not restrict interpersonal relationships or result in the widening of social inequalities."[97]

The seminal report ***I will if you will: towards sustainable consumption***[98] shows how progress on environmental issues depends on enabling people to act together. People are often "locked in" to unsustainable consumption patterns through perverse incentives, economic constraints, institutional barriers or inequalities in access that actively encourage unsustainable behaviours. There is a gap between their attitudes, which are often pro-environmental, and behaviours. The report describes a **'triangle of change'** whereby people, business and government work together in a supportive framework for collective action. Government creates the right regulatory framework. Choice-editing by retailers and manufacturers gets high carbon impact products off the shelves and low impact onto them.

We must prioritise cooperation over competition.

It is sometimes suggested that anthropogenic climate change is an example of the "tragedy of the commons", that we are doomed to maximise our personal benefit from a common resource even when we know it will lead to ultimate destruction[99]. But noble prize-winning author Elinor Ostrom refers to innumerable ways people collectively manage resources (trust, shared vision, grass roots). She argues that people will sustain and even improve shared resources providing that there is free communication, a shared vision, a high level of trust, and a mobilisation of participating communities from the bottom up.[100]

George Marshall argues that people will willingly shoulder a burden – even one that requires short term sacrifice against uncertain long-term threats – provided they share a common purpose and are rewarded with a greater sense of social belonging. However, people require proof that others are contributing before they themselves will act[101]. "Conditional cooperation" has deep roots. Robert Cialdini demonstrates that reciprocation is one of the key drivers of human behaviour[102]. What is needed is a coherent policy framework that provides a contract for shared participation. Mayer Hillman argued for a "conserver gains principle", rewarding those whose lifestyles make a low impact on the environment.[103]

Personal reward for climate action would come from an intensified sense of belonging and satisfaction that comes from contributing to a shared project. Arne Naess uses the term "**ecological self"** to describe the wider sense of identity that arises when our self-interest includes the natural world. "Unhappily, the extensive moralizing within the ecological movement has given the public the false impression that they are being asked to make a sacrifice – to show more responsibility, more concern and a nicer moral standard. But all of that would flow naturally and easily if the self were widened and deepened so that protection of nature was felt and perceived as protection of our very selves."[104]

The Common Cause Foundation[105] is based on the belief that challenges like climate change, global poverty and biodiversity loss require us to promote intrinsic and **"bigger than self"** values. People's decisions are driven by the values they hold frequently unconsciously and to the exclusion of the facts. The report *Common Cause* distinguishes between intrinsic or self-transcendent and extrinsic values or self-enhancing values. Appealing to extrinsic motives merely reinforces mindsets that cause problems like climate change.[106]

"We are human because our ancestors learned to share their food and their skills in an honoured network of obligation." (Richard Leahy)[107]

2.4 Acting in a global long-term context

The cumulative impact of decisions made for short-term self-interest is putting huge strain on our ecological system and leading to irreversible changes. Solutions must have global equity and social justice at their heart.

The challenge for the world is to get onto a sustainable consumption path. Overall demand must go down, whilst ensuring that the poorest in society and developing countries are not disadvantaged. The modern world is unsustainable. We urgently need to think and act in a global context with a long-term horizon. (Lazlo)[108]

The key principle for both moral and practical reasons should be "equitable access to sustainable development"

Wealthier countries should decarbonise more quickly than poorer ones.[109] Lord Stern suggests a promising way forward is to base cooperative action around notion of "equitable access to sustainable development."[110] Growth, development, mitigation and adaptation should go hand in hand. A just transition means governments must commit to mitigate negative impacts on displaced workers, affected communities and low-income households[111].

Two decades ago, Aubrey Meyer formulated the principle of "contraction and convergence" whereby rich countries reduce their emissions first. It was conceived as a mechanism for getting global agreement on the reduction of greenhouse gas emissions based on two principles: that GHG must be progressively reduced; and that global governance must be based in justice and fairness.[112] Regarding second principle, emissions of GHG must be based in an equal per capita allowance.

Sadly, little progress has been made. In 2022 UN Secretary General Antonio Guterres declared that "There is clearly a breakdown in trust between North and South, between developed and emerging economies"[113]. Rich countries had still not kept their 2009 pledge to provide $100 billion annually in climate finance nor had they operationalised the loss and damage fund agreed at COP27.

Eventually at COP 29 in 2024 a $1.3 trillion climate finance deal by 2035 was agreed. But only $300 billion of that will come in the form that developing countries are most in need of – grants and low interest loans from developed world. The rest will have to come from private investors and a range of new sources such as possible levies on fossil fuels and frequent flyers, which have yet to be agreed. The Alliance of Small Islands States & Least Developed Countries walked out in protest (although they later returned).

The net result of a myopic focus on self-interest on a global level is a lack of systemic wisdom. How do we move beyond this tendency?

Climate change should be framed in terms of the management of immense risks and that delay is dangerous[114]. In *Why are we waiting?* Stern sets out how he would place less emphasis on a cost benefit approach than in the 2006 *Stern Review*. Greater emphasis should be given to co-benefits such as improving health and well-being, enhancing bio-

diversity, creating jobs, reducing poverty, stabilising the economy, and increasing resilience and the ability to adapt to climate change.

The *Better Growth, Better Climate: The New Climate Economy Report* shows how structural and technological changes unfolding in the global economy combined with multiple opportunities to improve economic efficiencies provide all countries with opportunity to build lasting growth at same time as reducing massive risk of climate change. Priorities include building compact cities not urban sprawl, scaling up renewables, restoring degraded land and making agriculture more productive rather than continuing deforestation.[115]

We must put an end to economic short-termism.

The pandemic demonstrated the unpreparedness of the global economy to systemic shocks, despite early warnings from scientists. One legacy should be an increased focus on risk and resilience in appraisal and investment decisions. Too often we focus on the wrong targets. GDP is not necessarily a good measure. The transport metrics of time savings skew policy towards road building and unsustainable transport policies. A net zero test for public policy would ensure cross-government policy alignment, that government sticks to the least-cost path to net zero, and that net zero is considered early enough in decision-making process.

> ***"If there was a mandatory responsibility to deliver carbon reduction rather than numbers of housing – i.e. a legal requirement to deliver net zero in the NPPF – now that would be a real game changer!"***
>
> *Pathways to Net Zero Roundtable: Planning, March 2022*

In some of the best performing economies, growth is being decoupled from carbon emissions. A compact transit-orientated model for urban development in the world's largest 724 cities could reduce GHG by 1.5 billion tonnes CO2 per year by 2030, mostly by reducing personal vehicle use in favour of more efficient modes[116]. However, less emphasis should be given to narrow frameworks of cost-benefit analysis and greater emphasis to co-benefits such as air pollution, environmental damage of deforestation.

Stern argues that pure time discounting involves valuing welfare of people in the future lower than welfare of people today.[117] Climate change can radically alter the circumstances of future generations, making them much poorer "that would surely radically alter the discount factor between those parts of the future and now".

Mark Carney warns of the 'tragedy of the horizon' in which the catastrophic impacts of climate change will be felt beyond the traditional perspectives of businesses, investors, politicians and central bankers. Once the physical effects of climate change become the defining issue for policy makers it could be too late to stop their catastrophic effects.

Climate change is the ultimate betrayal of intergenerational equity "imposes costs on future generations that the current generation has no direct incentives to fix."[118]

2.5 Building a new framework

Our current world is unsustainable. What are the building blocks of a new paradigm that would equip us to respond adequately to challenges such as the climate crisis, biodiversity loss and global poverty?

In 1972 *The Limits to Growth*[119] argued that our civilisation is exhausting the resources upon which its continued existence depends. In 1987 a report of the World Commission of Environment & Development "Brundtland Report" defined sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs".

There are divergent views on whether economic growth can be consistent with meeting carbon reduction targets, but a debate that began on the fringes has gathered momentum. The idea of increasing wealth and increasing happiness has been closely linked to material consumption. There is a growing body of opinion that strictly linear GDP growth can no longer be the priority.

Achieving growth whilst decarbonising the economy is a central policy challenge.

Potential impacts on living standards mean that to move away from the current framework would be challenging politically. However, moving away from an economic system that prioritises strictly linear GDP growth doesn't have to mean our lives will be less worthwhile. Prioritizing growth according to its contribution to the Sustainable Development Goals would be a good place to start. These 17 interconnected goals aspire to sustainably increase global prosperity, equality and well-being.[120]

Moreover, pressures from climate change impacts will make growth ever harder to achieve. Professor Tim Jackson argues that the idea that renewable energy and greater efficiency will allow us to sever economic growth from its environmental impact runs contrary to historical evidence and the basic arithmetic of growth[121]. He argues that whilst green growth is obviously better than harmful growth, the speed with which we are able to decouple carbon from output is nothing like what it needs to be[122].

A report for the RSA surmised broadly three positions: business as usual growth; green or clean growth "a new model of capitalism"; and post-growth. The problem with post growth is that there is no political and economic narrative of transition that currently makes sense. "Momentum is behind clean growth, but the key question is whether it is really part of a transition to a sustainable economy."[123] Kate Raworth suggests a key task for policy makers is to come up with economic designs that would "enable nations coming towards the end of their GDP growth to learn to thrive without it."[124]

In *Donut Economics*[125] Raworth suggests we should be "agnostic about growth". She makes the case for a social foundation of well-being that no-one should fall below, and an ecological ceiling of planetary pressure that we should not go beyond. She argues that a "the prevailing direction of global economic development is caught in the twin dynamics of growing social inequality and deepening ecological degradation." She says we can't wait for economic growth to reduce inequality and clean up the environment because it won't.

Tim Jackson argues that the the tragedy of consumerism in not just that it is damaging the planet but that it is doing so in pursuit of false gods and elusive dreams. Consumerism entails handing over vast swathes of social life to material expression: a process driven… as much by the structural needs of the economy as it is by our own desires and needs, accelerated massively by advertising, marketing and the demand for economic expansion.[126]

Pricing properly for carbon is a fundamental building block but a just transition is about recognising the inequalities these measures can create and addressing them.

Climate change has been described as the greatest and most wide-ranging market failure ever seen[127]. Failure to price properly for carbon encourages unsustainable levels of consumption. The climate crisis now "demands collective action on an unprecedented scale and a dramatic reigning in of the market forces that created and are deepening the crisis".[128] Whilst this has equity implications, it could become a catalysing force for positive change[129].

The central dilemma for climate policy is how to ensure that the poorest in society are not penalized. How can we use carbon pricing as an instrument whilst ensuring that the transition to net zero avoids inflicting hardship on low-income households? Studies show the overall impact of a carbon tax doesn't need to be regressive as its revenue can be returned to households in ways that promote progressivity.[130] When revenues from carbon taxes are progressively redistributed as cash payments, as in British Columbia, public opposition softens significantly.[131]

Greener Vision has proposed a 'Climate Change Allowance' funded by putting a carbon price on everything we consume[132]. This would be a fixed allowance paid to every individual in the UK. If we price properly for carbon this is likely to be a substantial sum, so as a percentage of people's income it would be a progressive measure. Low-income households, who overall consume less carbon than higher income households, would be better off. Higher income households consume three times as much carbon as lower income households[133]. The policy would include a package of energy efficiency measures and targeted support for poorest households.[134]

Our social and economic structures are a product of our way of thinking. Systemic change is a deeply personal endeavour.

If we are to rise to the challenge of addressing our most serious social, environmental and systemic problems we cannot avoid looking at ourselves. Sociologist G.H. Mead argued that organised custom represents what we call morality. There is a link between morality and pragmatism, whereby a moral act is a social act that addresses wider interests[135].

Socrates famously declared that "The unexamined life is not worth living"[136]. How far and under what conditions are people capable of facing themselves? German sociologist Norbat Elias suggested that we avoid emotionally charged ideological evaluations and polarizing notions of good evil. He recommended that we look at ourselves with a higher degree of detachment, to take a "detour via detachment".[137]

Meister Eckhart, the non-dual Christian mystic sage of the 12th century, wrote that "a really perfect person is dead to self". Guy Claxton suggests that the more the self is involved, the more cautious consciousness becomes. He encourages us not to actively think, but rather to bear the problem or question in mind. "Truth waits for eyes unclouded by longing".[138]

Dark Energy, 2006-7, acrylic on board, 92x92cm

PART THREE: Rising to the Challenge

I. Seeing the whole picture
II. Integrating heart and mind
III. Being at one with nature
IV. Healing the whole system
V. Becoming citizens of ‘One World’

3.1 Seeing the whole picture

A key question is whether the assumptions underpinning decision making on climate change are fit for purpose. It is vital that we become more self-aware and honest about the rationale for our decision making.

Too often the lens through which we perceive is faulty. We may imagine that we see things as they are, but we are in fact laden with preconceptions and often unexamined assumptions which colour and influence our view of everything. As anthropologist Gregory Bateson observed "very few people seem to realize the enormous theoretical power of the distinction between what I 'see' and what is actually out there."[139]

To understand knowledge, we need to know the characteristics of the groups which create and use it. Thomas Kuhn's seminal work *The Structure of Science Revolutions* introduced the concept of the "paradigm"[140]. All knowledge depends on preconceptions which may need to be examined or altered, or even rejected, if one wants to progress in any given field. A "paradigm shift" occurs when the prevailing paradigm is completely rejected and replaced by a new paradigm. How we think is inextricably linked to our sense of identity.

Bateson highlights the risks of extinction that arise by way of loss of flexibility.

When ideas go unexamined, they can become hard-wired habits very difficult to reverse with sometimes disastrous consequences.[141] George Marshall demonstrates how we are poorly evolved to deal with climate change, which "exposes our talent for seeing only what we want to see, disregarding what we would prefer not to know". [142] Everyone converts climate change into stories that embody their own values, assumptions and prejudices.

> ***"We are part of the problem if we persist in thinking we can reach a 'better choice nirvana' if we don't radically change the funding powers and pace of delivery. 'Business as usual' won't do it. We are planning to overshoot if we carry on as we are."***
>
> *Professor Greg Marsden, Greener Transport Council*

Margaret Heffernan shows how we actively choose to blind ourselves to seeing. **"**When we are wilfully blind, there is information we could know, and should know, but don't know because it feels better not to know."[143] "Wilful blindness begins not in deliberate choices to be blind, but in a skein of decisions that slowly but surely restrict our view."[144]

Wilful blindness is exacerbated by ideologies; narrow mental models that insist on simple solutions; excessive focus on pay; steep hierarchies, deep inequalities, ornate bureaucracies; targets, KPIs, whole managerial toolkits aimed at managing people like machines makes them as unthinking as machines.

> ***"Is the industry being honest enough with politicians about scale of challenge? We know it's not just about demand management, the planning system, sustainable transport, digital etc. It's about all those things and doing them now! Are we holding up the mirror so that our political leaders can make the urgent and necessary decisions?"***
>
> *Pathways to Net Zero Roundtable: Politics & Local Delivery, March 2022*

3.2 Integrating heart and mind

We need to engage our emotional brains in climate change. The tendency to separate thoughts and feelings causes confusion and undermines decision-making. We need compelling stories that speak to people's values.

The division between the rational and emotional brain runs deep in our culture. Bateson describes it as "monstrous"[145]. Tony Leiserowitz describes it as a "long cultural mistake", "without that feeling of emotion, you cannot make good decisions".[146] Seymour Epstein describes "analytical processing" and "experiential processing".[147] Rational scientific data can lose against a compelling emotional story that speaks to people's values.

Reason is not pure, and feelings are not intangible. Feelings are just as cognitive as other precepts. The interdependence of thoughts and feelings is evidenced at a biological level. Candace Pert illustrates how our internal chemicals, neuro peptides and receptors, are the biological underpinnings of our awareness manifesting as emotions, beliefs expectations.[148]

Antonio Damasio explains how the brain and the body are mutually interactive biochemical neural circuits[149]. He shows how emotions and feelings are intimately enmeshed. "The mind had to be first about the body, or it could not have been". This type of thinking marks a departure from the rationalist framework embodied by Kant, Descartes and Newton.

Much of the way we live today has been designed using outdated models of how humans think, feel and behave.

> ***"We will continue to fail to change anything other than at the margins unless we fundamentally alter our whole mindset around what it means to design behaviour change interventions."***
>
> *Professor Jillian Anable, Greener Transport Council*

Advances in behavioural science show that it is an illusion that we alone determine what we choose. Richard Thaler and Cass Sunstein coined the term "choice architect" for someone who "has the responsibility for organizing the context in which people make decisions".[150] They call for a better system of incentives and feedback.

Pete Dyson and Rory Sutherland refer to the concept of a "homo economicus" who makes decisions using rational cost-benefit analysis in an environment of perfect trust, fully aware of all the available options, acting purely in their own self-interest. But outside of academia these conditions rarely exist. "If we want people to behave differently, it usually pays to first learn how they perceive the world, rather than lecture them on what the world is like and how it ought to be." [151]

> ***"I find it really, really interesting the extent to which in an engineering culture psychological solutions are treated as if they are cheating. If you are an engineer, you can only solve problems through engineering because to do it any other way is basically seen as not playing the game. I think this happens when we get an increasingly siloed business culture."***
>
> *Pathways to Net Zero Roundtable: Behaviour Change April 2022*

3.3 Being at one with nature

"When we forget that we are embedded in the natural world, we also forget that what we do to our surroundings we are doing to ourselves." (David Suzuki)[152] Decision making is flawed when it ignores interdependence with the biosphere.

Our society and its predominant structures originate from a time when the individual was understood to be separate from – and often in opposition to – the world we inhabit. One result of this mindset can be seen in economic systems which lead to the unsustainable plundering of finite resources. In 1972, *The Limits to Growth*[153] argued that our civilisation is exhausting the resources upon which its continued existence depends.

In his influential book *The Tao of Physics* Fritzof Capra demonstrated the limitations of the mechanistic world view embodied by thinkers such as Newton and Descartes and pointed instead to a more fruitful holistic systems-based approach[154]. David Suzuki traces our current plight back to the Renaissance, we lost the idea that we were embedded as a strand of nature and placed ourselves at the top of a pyramid with everything else beneath us**.** This idea has strengthened since the Industrial Revolution but "it can be reversed."[155]

Climate change exposes the shortcomings of a rationalist view of the world. Ervin Lazlo argues that the modern world is unsustainable, and that we urgently need to think and act in a global context with a long-term horizon.[156] Our economy is based on the belief we can extract resources boundlessly and use them inefficiently. Decision making is flawed when it ignores our interdependence with the biosphere. We must reduce energy demand and consumption. However, this will challenge some of the predominant forms of consumerism and inevitably impact on lifestyles.

> ***"How do we stop the juggernaut that is selling more vehicles? No one wants to talk about that! Government policy is to encourage as many vehicles to be produced as possible, for jobs to be created, innovation to happen and more vehicles to be sold!"***
>
> *Delivering Net Zero Road Transport Roundtable, June 2023*

We have become hard wired to focus on what will serve our immediate self-interests.

Bateson describes this as "purposive consciousness", a shortcut device to enable us to get what we want. Whilst this might be an effective means of satisfying our immediate urges and desires, it leads ultimately to a lack of systemic wisdom and is putting massive strain on our ecological system. By focusing on the "common sense" dictates of our individual consciousness we make decisions that are "greedy and unwise."[157]

How might we work towards "a sacred unity of the biosphere with fewer epistemological errors"? There is no point in returning to more primitive times as this would involve the loss of the wisdom that prompted the return and would only start the whole process over.[158] We should seek to promote intrinsic and "bigger than self" values (Common Cause)[159], and to foster the understanding that protection of nature is "protection of our very selves"[160].

3.4 Healing the whole system

We need to take a systemic approach to addressing climate change and to treat the causes rather than the symptoms. If we are to tackle the climate crisis, a fundamental reset of our relationship with the environment will be required.

We need to address the root cause of the climate problem, and we need solutions which tackle causes not symptoms. Technological improvements are often undermined by increased usage, rebound effects, as costs for consumers fall due to greater efficiency. We are using too much energy to fulfil socially and culturally constructed needs and desires[161].

Professor Dieter Helm describes "making polluters pay" as the single most radical and effective policy that could be adopted both for prosperity and for the environment[162]. The costs of pollution should be integrated into every decision made by businesses and consumers. We should follow the "net environmental gain principle" to ensure we protect our natural capital. A strong, predictable and rising carbon price is needed.

> ***"Carbon is the problem, so we must attack carbon directly. Telling people to use less carbon, trying to promote modal switch won't affect change on the timescale needed. Carbon taxation will give us half a chance of getting the balance across different sectors correct."***
>
> *Professor Stephen Glaister CBE, Greener Transport Council*

Climate change has been described as the greatest and most wide-ranging market failure ever seen[163]. Failure to price properly for carbon encourages unsustainable levels of consumption and ongoing market failures, such as the massive fossil fuel consumption subsidies which diminish the incentive to use energy efficiently and switch to cleaner fuels.

Global fossil fuel consumption subsidies doubled in 2022 to an all-time high of USD 1 trillion[164]. This was primarily driven by the global energy crisis following Russia's invasion of Ukraine. Spending to bring down energy bills was a huge fiscal burden for governments. These interventions were mostly grossly inefficient and not at all well targeted, with low-income households receiving the same level of support as high-income households.

We need solutions which tackle the causes not the symptoms of the problem.

Anthropologist Gregory Bateson once asked "What sort of habit of mind leads to paying too much attention to symptoms and too little to the system? Treating the symptom makes the world a safe place for the pathology, such as 'curing congestion' by building more roads!"[165]

Too great an emphasis on road building conflicts with net zero targets by inducing traffic. Speaking at a Greener Transport Solutions webinar in 2021 Climate Change Committee Chair Lord Deben highlighted contradictions between achieving the goal of net zero and delivering the £27.4 billion road investment programme[166]. In 2023 the Transport Select Committee said DfT should prioritise strategic road maintenance over new roads.[167]

> ***"Is government acting like a gambler or a steward when it comes to the question of future levels of road traffic?"***
>
> *Professor Glenn Lyons, Greener Transport Council*

3.5 Becoming citizens of ‘One World’

We need to connect with our natural empathy and respect for each other and all living species. We should seek to promote intrinsic values. Climate change could bring us together and help us overcome our divisions.

“We need to move from treating people as consumers to treating people as citizens”. *Professor Peter Jones OBE, Greener Transport Council*

Climate change is one issue that could bring us together and help us overcome our historic divisions.

We need to think and act in a global context and for the long term. We need to encourage people to do the right things for the right reasons. Political expediency is self-defeating. The reasons for ecological policies are as important as the policies themselves and these need to be communicated clearly in order to build the mandate for change.

Climate change needs to be understood as a global intergenerational problem requiring unprecedented levels of cooperation. We must now adapt to the scarcity of resources we have caused, and the rapidly diminishing space left in our global atmosphere for carbon emissions[168]. In the words of Figueres and Rivett-Carnac,

“Faced with the ultimate scarcity, we must internalise the new zero-sum (either we all win, or we all lose) and apply a mindset of abundance to that which we have left and that which we can co-create and share.”[169]

The challenge for the world is to get onto a sustainable consumption path. Solutions must have equity and social justice at their heart.

The cumulative impact of decisions made for short term self-interest is putting huge strain on our ecological system and leading to irreversible changes. The net result of a myopic focus on self-interest on a global level is a lack of systemic wisdom. UN Secretary General Antonio Guterres has pointed to “a breakdown in trust between North and South, between developed and emerging economies”[170].

Insights from the complexity sciences might help us begin to envisage a more co-operative and sustainable world. Complexity understands the world in terms of organic holistic systems. Stuart Kauffman argues that the complexity of biological systems and organisms might result as much from self-organisation and far-from-equilibrium dynamics as from Darwinian natural selection. He suggests that self-organization is the root source of order.

“Order is free, it just happens”. Kauffman points to the importance of cooperation over competition, creating a state of dynamic equilibrium. How do we avoid potential catastrophic consequences? He suggests all we can do is “be locally wise, even though our own best efforts will ultimately create the conditions that lead to our transformation to utterly unforeseen ways of being”.[171]

THE FINAL WORD

"The true value of a human being is determined primarily by the measure and the sense in which he has attained to liberation from the self."[172]

Albert Einstein

Our world is fragmented, disordered and chaotic. We are out of alignment with ourselves and the environment on which we depend. We need an approach to tackling the climate crisis that seeks to create unity. This will involve a radical shift in perception. Policy should be informed by the 'Pillars of Unity'.

'Policy as usual' will not achieve net zero. The world is way off track. The brutal reality is that emissions have risen and will continue to rise. As Professor Helm concludes, the last 30 years have been an abject failure in tackling the climate crisis. Even now coal remains the biggest culprit[173].

At a time of rising geopolitical uncertainty, volatility in energy markets, insecurity of supplies and escalating fuel and gas prices, it becomes more critical than ever to design policies in a way that avoids unintended consequences and ensures a fair and just transition to net zero. This is a battle for hearts and minds.

To have even a 50% chance of success we must cut global GHG emissions by half their current level by 2030, half again by 2040 and finally zero by 2050. A change of this magnitude will require a major transformation in almost every area of our lives.

Margaret Heffernan invites us to "learn to see better." As all wisdom does, seeing starts with a few simple questions: What could I know, should I know, that I don't know? Just what am I missing here? "We make ourselves powerless when we choose not to know. But we give ourselves hope when we insist on looking.[174]

THE PILLARS OF UNITY

I. **Seeing the whole picture** – we need to become more honest and self-aware about our decision-making.
II. **Integrating heart and mind** – we need to engage our emotional brains in climate change.
III. **Being at one with nature –** we need a radical realignment of how we perceive ourselves in relation to the environment on which we depend
IV. **Healing the whole system** – we need to address the root causes of climate change: our addiction to fossil fuels.
V. **Becoming citizens of 'One World'** – we need to connect with our natural empathy and respect for each other and all living species.

ANNEXES

1. The Art of Seeing

2. Thought Leadership 2020-2024

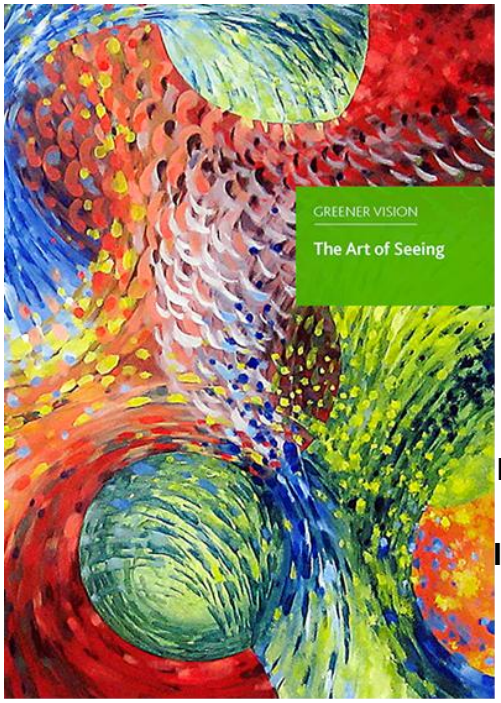
3. The Tabula Project 1993-2023

4. About the Paintings

5. THE FIVE KEY PRINCIPLES *for* DECARBONISING TRANSPORT

REFERENCES

ANNEX 1: The Art of Seeing



Greener Vision: The Art of Seeing calls for a radical shift in perception and an approach to tackling the climate crisis that seeks to create unity rather than division.

Policy should be informed by five key 'Pillars of Unity':

I. We need to strive to 'see the whole picture'.
II. Better 'integration of thoughts and feelings' would improve decision making.
III. We must respect the 'unity of the biosphere' and be at one with nature.
IV. We should seek to 'heal the whole system' by tackling root causes of climate change.
V. We need to become citizens of 'One World'.

In developing the 'Pillars of Unity', Greener Vision drew on discussions with more than 700 politicians and leading stakeholders on how to decarbonise transport. The current approach has achieved little progress in more than 30 years. Increased road traffic has largely offset improvements in vehicle fuel efficiency and the switch to electric vehicles. The Pathways to Net Zero thought leadership programme concluded that we need a whole systems transition to net zero and a paradigm shift in terms of how we think about decarbonising transport[1].

'The Art of Seeing' report also draws on a creative project that spanned 30 years. The Tabula Project started with the assumption that we won't solve our most intractable problems with the same thinking that created them in the first place[2]. The Tabula Project aims to provide a new perspective on the mind. Anthropogenic climate change is not the only peril we face but it is arguably our greatest existential threat. If we are to make any real progress, we need to change our whole approach.

Our world is fragmented, disordered and chaotic. We are out of alignment with ourselves and the environment on which we depend. Incremental changes won't be sufficient to bring about the transformation required. Far steeper emissions cuts are required to avert a future dominated by catastrophic climate impacts.

[1] https://greener-vision.com/publication/pathways-to-net-zero-series-of-reports-and-roundtable-discussions/
[2] https://www.claire-haigh.com/

ANNEX 2: Thought Leadership 2020-24

*"What would be a **credible** and **politically deliverable** framework for the decarbonisation of transport that will deliver the necessary emissions reductions **in the shortest time possible** whilst **mitigating any negative social impacts**?"*

This question was first posed at the **Transport Knowledge Hub: Decarbonising Transport** event in 2020. **Greener Vision** (formerly **Greener Transport Solutions**) convened the **Greener Transport Council** to take forward the key outcomes of the workshop, and spearhead thought leadership programmes in 2021 and 2022-3.

GREENER TRANSPORT COUNCIL (2021-2024)

An independent group of academics and other experts focused on accelerating the decarbonisation of transport and the transition to net zero in a fair and just way. The GTC's primary purpose was to help ensure that emissions reductions are delivered at the scale and pace required to achieve the net zero targets. Thought leadership events were chaired by GTC leading academics:

- **Professor Jillian Anable**, Chair in Transport and Energy, Institute for Transport Studies, University of Leeds
- **Stephen Glaister CBE**, Emeritus Professor of Transport and Infrastructure at Imperial College London, Associate of the London School of Economics
- **Professor Peter Jones OBE**, Professor of Transport and Sustainable Development in the UCL Centre for Transport Studies
- **Professor Glenn Lyons**, Mott MacDonald Professor of Future Mobility, University of the West of England
- **Professor Greg Marsden**, Professor of Transport Governance, Institute for Transport Studies, University of Leeds

RISING TO THE CHALLENGE | 2021

Publications

- **Rising to the Challenge: Achieving net zero will require new thinking, creative solutions and systemic change, March 2021**
- **Recharging Britain's Roads Policy, Supplementary Written Evidence for Transport Select Committee Inquiry, April 2021**
- **A Manifesto for Decarbonising Transport, September 2021**

Events – Three webinars were attended by 600+ stakeholders. Keynotes: Climate Change Committee Chair Lord Deben; Transport Select Committee Chair, Huw Merriman MP; Mayor of North Tyne, Jamie Driscoll.

- **Not the journey but the destination: how our whole economy needs to change**
- **How the Government can support technical and policy solutions to encourage people to make lower carbon travel choices**
- **The role of localism in ensuring a fair and just transition to net zero**

PATHWAYS TO NET ZERO | 2022-2023

Publications

- **Pathways to Net Zero: Building a framework for systemic change, March 2022**
- **Pathways to Net Zero: Report on a Roundtable Discussions Series, June 2022**
- **Pathways to Net Zero: A Greener Vision, September 2022**
- **Pathways to Net Zero: Report on Roundtable Discussion – Hasta La Vista, Carbon! November 2022**
- **Pathways to Net Zero: Report on Roundtable Discussion – The Future We Want November 2022**
- **Pathways to Net Zero: A Series of Reports & Roundtable Discussions in 2022, December 2022**
- **Pathways to Net Zero: Report on Roundtable Discussion – Delivering Net Zero Road Transport, June 2023**

Events – Eight roundtable discussions were attended by 110+ stakeholders chaired by the leading academics on the Greener Transport Council.

- **Pathways to Net Zero – Roundtable Discussion Series 1, March 2022**
  Wider Economy | Pricing | Planning | Politics & Local Delivery | Behaviour Change
- **Pathways to Net Zero – Roundtable Discussion Series 2, October 2022**
  Hasta La Vista Carbon! | The Future We Want
- **Pathways to Net Zero – Delivering Net Zero Road Transport, June 2023**

GREENER TRANSPORT COUNCIL | 2024

Publication

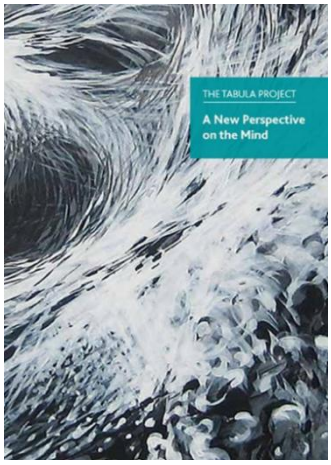
- **Paying for Driving: Is doing nothing an option? October 2024**

Event

- **Shifting the focus? Is adaptation the key to mainstreaming action on climate change? June 2024**

ANNEX 3: The Tabula Project 1993-2023

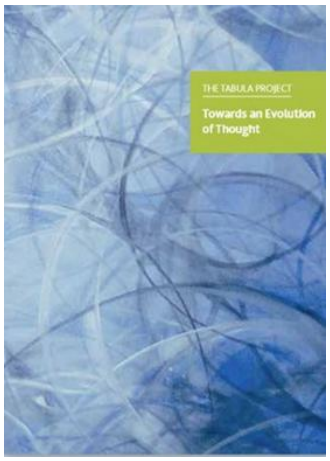
The overall objective of The Tabula Project is to provide a new perspective on the mind. The paintings depict states of consciousness and thought, and the development of the project is informed by extensive research.



The Tabula Project: A New Perspective on the Mind describes the development of the paintings and how they relate to different states of consciousness and thought.

The level of threat we live with is greater than ever, but the mindset that got us into this predicament won't get us out of it. If we want to change behaviours we need to change the premises which led to them.

We need a shift in consciousness away from one where we are narrowly focused on individual desires, to one where we operate from a higher level of consciousness, at one with our society, our environment and the world around us.

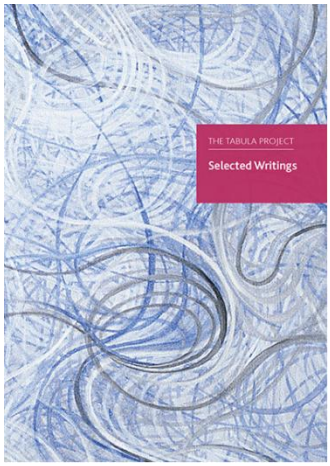


The Tabula Project: Towards an Evolution of Thought includes a summary of the main findings of the research. The material is grouped into three main sections:

1 Examining how we think – explores the assumptions governing our current perceptions and understanding of the world.

2 The need for change – our understanding of our "selves" is problematic. We need to embrace a more holistic perspective where the individual and the social cannot be separated.

3 Towards an evolution – points to the steps we need to take to begin to evolve our thinking and make better decisions.



The Tabula Project: Selected Writings includes personal reflections, poems and excepts from art diaries as the ideas for the project developed.

Poems **Metamorphosis** and **Evolve to Survive** inspired the first two series of 'Examining Thought' paintings. From the art diaries, **Tabula Rasa** sets out the thinking behind 'Clearing the Mind. Personal reflections include **The First Rule** which introduces the concept of 'non-memory-based thinking'. **Awareness** reflects on the lens through which we perceive. A sea-change in perception underpinned by **Core Principles and Objectives**, is needed if we are to tackle our most difficult challenges.

ANNEX 4: About the Paintings

The Tabula Project aims to provide a new perspective on the mind. The paintings seek to depict different states of consciousness and thought. They are in three main sections and were produced in parallel over a period of more than two decades.

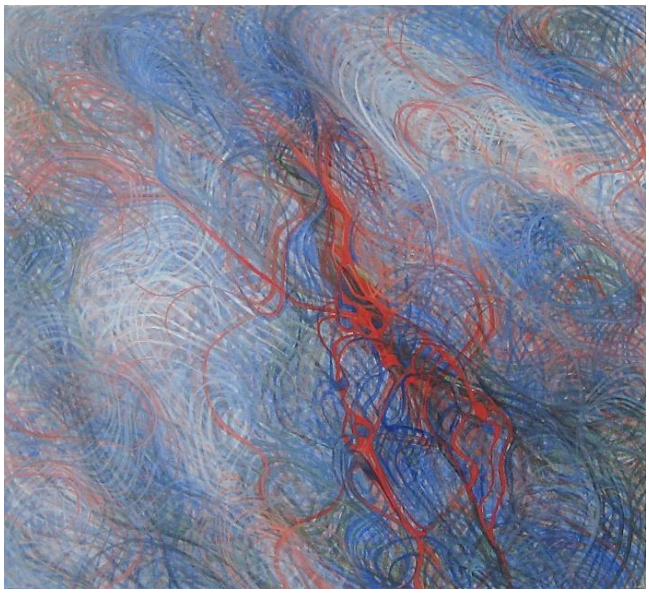
- **Examining Thought** seeks to explore current predominant thought forms.
- **Clearing the Mind** is about achieving a state of consciousness without thought.
- **Building a New Framework** is about discovering a new integrated framework for thought where the whole mind is in balance.

EXAMINING THOUGHT

Faulty perception is at the root of our suffering and much of the trouble in the world. If we can correct this perception the world will radically change. We need to examine ourselves, the filter through which we perceive the world. This leads to the recognition of our fundamental interdependence with each other and the biosphere.

Metamorphosis explores the fluidity of the self and the infinitely malleable and changeable nature of consciousness. The paintings represent stages of a poem. They depict states of awareness, and a range of sensations of pain and pleasure which could be experienced by any sentient being. The fourth painting in the series, *Easing the burden of consciousness* (pictured) encapsulates the driving motivation behind The Tabula Project.

[1993, 15 paintings, oil on canvas, each painting 96x106 cm]



Evolve to Survive explores the self-limiting nature of much of our current thinking. The paintings represent stages of a poem. The series describes how thinking that is focused primarily on self-interest can become self-defeating and destructive, as described in the second painting *Life shrinks further inside* (pictured). We are hard wired to focus on that which serves our immediate narrow self-interest, but this can lead to poor decision-making.

[1994, 4 paintings, oil on canvas, each painting 80x88 cm]

Forms of Thought attempts to represent generic thought forms. The paintings in this series are deliberately devoid of figurative content, the assumption being that the patterns depicted could apply to a wide range of subject matter. The paintings seek to explore in the most abstract sense how the mind processes and generates information.

[1994-2007, 9 paintings, oil on canvas, each painting 80x88 cm]

CLEARING THE MIND

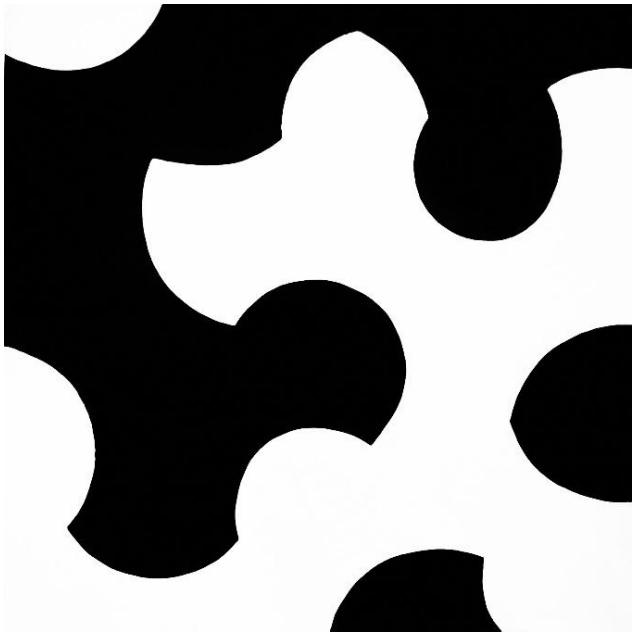
Our minds are often cluttered with repetitive thoughts that make it very difficult for us to be fully present. Managing the mind is a key skill, and this includes the discipline at times to be able to switch thought off. We need to discover the ability to live fully in the here and now. This is the pathway to true understanding.

States of Mind depict different states of consciousness. Each ink wash was produced very quickly, the result of a spontaneous outpouring of visual thoughts and feelings. It was an enormously cathartic process. The effect was one of at least briefly decluttering the mind, accessing stillness, before more thoughts and feelings emerge.

[1993, 15 studies, ink on paper, each painting 34x44 cm]

In Search of the Perfect Line illustrates the challenge of quietening the mind. The paintings seek to define the mind at rest, the landscape upon which new thought will eventually emerge. The perfect line represents a clear mind. But in searching for the perfect line, new lines continue to appear seeming to replace the previous ones - like repetitive thoughts which echo unprompted and repeatedly through the mind.

[1994, 6 paintings, oil on canvas, each painting 80x88 cm]



Tabula Rasa depicts the mind at rest, free of thought and full of infinite potential. The perfect line emerges as the interface between black and white. Clearing the mind of thought, creating a blank canvas on which we can create a new framework. This creating the conditions for mindfulness, pure potentiality and the freedom to redefine ourselves.

[1995-2015, 16 paintings, acrylic, each painting 92x92 cm]

BUILDING A NEW FRAMEWORK

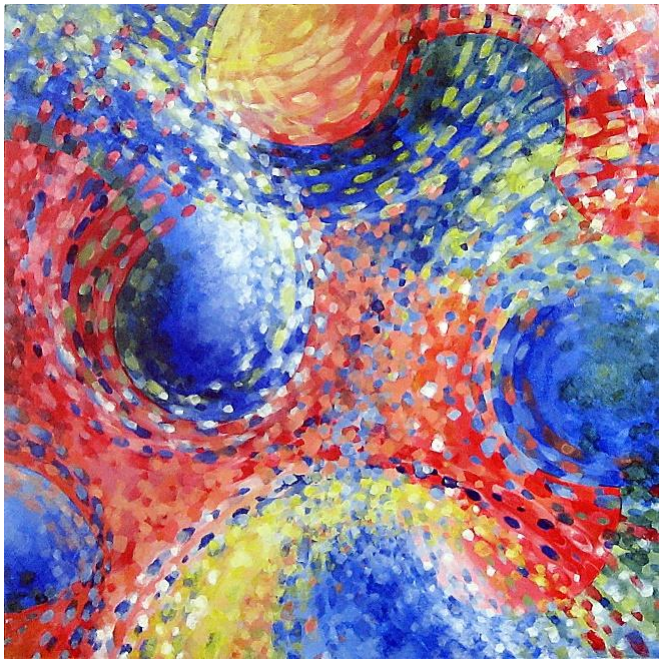
The goal is a new integrated framework for thought, where the whole mind is in balance, with thoughts, feelings and intuitions working together in harmony. The mind becomes a tool at our disposal. Free from incessant thoughts we can become open to new insights, and eventually able to reach a place of enlightenment.

Building a New Framework develops further the generic patterns of thought depicted in the Forms of Thought series. The nine-part series presents an evolution to an increasingly integrated thought system. The journey begins with a representation of basic cognitive awareness and gradually builds in layer by layer more developed thoughts, feelings, and intuitions. The final painting in this series (pictured) seeks to bring all these aspects together into an integrated whole.

[1994-2010, 9 paintings, oil on canvas, each painting 80x88cm]

Finding New Frontiers illustrates some insights from the fields of quantum mechanics, string theory and the complexity sciences, including *The Particle and the Wave* (pictured). Patterns can be a way of expressing the inexpressible where verbal communication is inadequate. There are fundamental principles about how things work, and these principles can be captured in patterns.

[2006-2007, 6 paintings, acrylic on board, each painting 92x92 cm]



A New Framework. Here the boundaries between thoughts, feelings and intuitions begin to dissolve. The paintings point to the beginnings of a new framework for awareness. We may recognise that the self is an object in our awareness, a filter through which we see the world. We may come to see our knowledge as a tool or a construction, and our "selves" as constructions too. This brings the possibility of real change: the liberation from the self. With this comes the realisation that any division between ourselves and the world is an illusion.

[2011-14, 3 paintings, oil/acrylic on board, each painting 92x92cm]

ANNEX 5: THE FIVE KEY PRINCIPLES *for* DECARBONISING TRANSPORT

i) **We need a whole systems approach to net zero**
ii) **We must reduce energy demand**
iii) **We should price properly for carbon**
iv) **We must ensure a fair and just transition**
v) **We must strengthen delivery across the UK**

i) A whole systems approach

We need a whole-systems approach to transport decarbonisation that reflects the shift to digital connectivity, and the integration of transport with land-use planning, energy, green finance and the trip generating sectors of the economy such as health, education and employment.

> ***"The missing part of the jigsaw, up to now, has been to develop strategies to avoid travel, both through reducing trip numbers and trip lengths. Here collaboration with the major trip generating sectors is essential."***
>
> *Professor Peter Jones OBE, Greener Transport Council*

A useful way to frame the challenge is the "improve – shift – avoid" framework. We can improve the vehicles, encourage modal shift, and reduce the need for travel. Peter Jones demonstrates that since transport is a derived demand, fundamental changes in travel behaviour depend on business model decisions taken in other sectors[175].

There is scope to work with other sectors and employers to reduce demand by digitalization such as by NHS remote appointments, more homeworking, or greater walking and cycling. The NHS's Net Zero Carbon strategy recognises that 14% of carbon emissions associated with its estate and operations come from travel[176].

The integration of sustainable transport with land use planning and digital technology is a fundamental building block for achieving net zero.

Glenn Lyons describes a 'triple access system' whereby one can combine transport with good land use planning and a very mature telecommunications system[177]. The challenge in delivering this is how to overcome the silos of government [See v].

Transport for New Homes has demonstrated that the current planning system appears to take limited or no account of the transport impacts, resulting in car dependent developments plopped into green fields miles from anywhere.[178] Research for the Transport Knowledge Hub identified siloed transport and planning decision-making and fragmented and short-term public sector funding as the key barriers to integrating sustainable transport and housing.[179]

Professor Dieter Helm argues that digitalisation will increasingly drive the economy. Whilst policy makers understand the importance of electrification and smart systems, there is less recognition of just how far digitalisation will drive the entire economy and therefore the choices that we have to make about whether we actually want transport. Our current system

of regulation is not designed "to address the integration of transport into our digital world, and into our economy in a decarbonisation context"[180].

The integration of transport with energy is critical to delivery of net zero transport.

A bigger and faster take-up of electric vehicles will only happen if the grid can handle higher demand in load and the rate of connections. Zemo Partnership's Delivery Roadmap details a series of cross-cutting proposals to expand and improve charging infrastructure; promote the decarbonisation of the electricity grid; future proof local grids and bring forward grid upgrades needed to deliver EV infrastructure.[181]

The creation of the Office for Zero Emissions Vehicles is a step forward, but the National Audit Office recommends a review of whether it has "the capacity, skills and remit to enable it to effectively oversee the fast-paced transition implied by the 2030 target."[182] Our energy system has not been designed to cope with electricity being generated from a multiplicity of different sources.

Professor Nick Eyre argues that delivering a secure, affordable and sustainable energy system will require an energy transition on the scale of the industrial revolution. The sustainable energy transition will not just involve the shift from unsustainable fuels to renewables but also changes in how, when and where these fuels are used. Energy use in a car-dominated system of personal transport depends not just on technological features of the car but also occupancy rates, performance of other modes, land use planning, road infrastructure, regulations governing car use, wider cultural norms[183].

Greening finance and the financing of green investments will be key.

The investment needed to decarbonise transport will go beyond what will be achievable from the taxpayer or individual user. A key challenge will be how to harness private investment. Mechanisms such as land value capture will be needed. Dr George Hazel has shown how this successfully help in funding for railways[184]. In his book *Value(s)* Mark Carney argues that the financial system can be retooled to make markets part of the solution. Sustainable investing is developing into an essential tool to bring the values of the market into line with those of society[185].

A landmark study from the Smith School in Oxford[186] demonstrates that green stimulus packages are more effective at supporting increased economic activity, generating higher numbers of jobs and long-run cost savings as well as having strong potential to cut emissions. Ideal investments are those that put newly unemployed people to work quickly, delivering a high short-term multiplier, while producing valuable assets that meet the needs of the future, delivering a high long-term multiplier. Clean energy investment, for example, has positive high long run multiplier impact and a positive climate impact. By contrast airline bailouts without attaching climate conditions score lowest on both counts.

A 'net zero test for public policy'

Lack of joined-up policy making can undermine cross-government ambitions. A 'net zero test for public policy' would help ensure alignment, that government sticks to the least-cost path towards net zero and that net zero is considered early enough in the policy making process[187].

ii) Reducing energy demand.

Energy efficiency and reduction of embedded carbon will be critical. We must accelerate the transition to zero emission vehicles and decarbonise existing fleets, but we must avoid rebound effects. Technical solutions alone will be insufficient. Traffic reduction is also needed.

> ***"There isn't an electrification pathway combined with traffic growth that is consistent with the Sixth Carbon Budget. Government's response is to downgrade the ambition for transport. Are we okay with that?""***
>
> *Professor Greg Marsden, Greener Transport Council*

The Seventh Carbon Budget sets out that by 2040 four in five cars should be electric, but people should also be encouraged to walk and cycle, and public transport must play a crucial role[188]. In their latest progress report to Parliament, the Climate Change Committee (CCC) concluded that the annual reduction in surface transport emissions across the rest of this decade will need to be more than four times the small (0.9%) reduction in 2023.[189]

In their 2023 progress report the CCC concluded that when comparing the Net Zero Strategy with the Carbon Budget Delivery Plan the most significant change was an increase in emissions from surface transport, partly due to the fact that any estimate of savings that can be achieved by reducing traffic had been removed.

We need to rethink the combination of technologies and behaviour change. To decarbonise at the pace and scale needed, we will need to see a reduction in travel demand and a large-scale shift to public transport and shared vehicles – a step-change in the efficiency of passenger and freight movement. But without a step-change in local transport plan funding, it is not easy to scale-up sustainable alternatives.

Accelerating the roll out zero emission vehicles and decarbonising the existing fleet.

The 'ZEV (Zero Emission Vehicle) Mandate', setting minimum EV sales targets for each manufacturer, came into force in Great Britain at the start of 2024. Grant funding for zero emission buses is available to local authorities in England outside of London[190]. The previous government also set an intention to end the sale of all non-zero emission heavy goods vehicles (HGVs) from 2040, with lighter HGVs from 2035. The Renewable Transport Fuel Obligation (RTFO) provides incentives to supply low carbon fuels.

Sales of electric cars have grown rapidly in recent years, but there are concerns that the market is not growing quickly enough to meet targets under the 'ZEV Mandate'. The 'ZEV Mandate' needs further reinforcement to promote zero emission technologies. There are major gaps in policies for HGVs, vans, buses, coaches, and low-carbon fuels, which are crucial for rapidly reducing surface transport emissions by 2035.

Heavy goods vehicles are 1% of the vehicle fleet but contribute 20% of UK surface transport emissions[191]. The plug-in grant for zero emission HGVs should be increased. A date for ending sales of non-zero emission buses is needed. A net zero development roadmap is needed for the coach sector. We need to expand and improve the charging infrastructure; ensuring that suitable chargers are available for all vehicle types.

Even as zero tailpipe emission vehicles gain greater market share, it will take decades for the residual ICE fleet - cars, vans, trucks, buses and coaches - to become fully electrified. Expanding the use of low carbon fuels, including liquid and gaseous biofuels, will encourage reductions in GHG emissions as the market for zero emission vehicles matures. The RTFO lacks ambition and needs to be extended. A long-term government strategy to boost both production and demand for low carbon fuels is needed.

Delivering modal switch for passengers and freight to more sustainable transport.

It is estimated that achieving the 2030 net zero target for transport will require a reduction in car kms of approximately a quarter[192]. Green Alliance estimates that the Government's anticipated roll-out of EVs will be insufficient to keep us on the 'balanced pathway' to its net zero target, and that a reduction in car-km of 20-27% by 2030 will be needed[193]. The Major of London has pledged 27% reduction in car kms by 2030[194]. The Scottish Government has pledged a 20% reduction[195].

The reduction in car kms required will require a cultural change. National Highways should address car occupancy levels and promote public transport to make more efficient use of the existing network. They should measure throughput by people rather than vehicles. Bold action on behaviour change needs a clear rationale and strong leadership from central government. Some form of constraint will be needed to deliver traffic reduction. The use of targeted emission zones can be an instrument for achieving a modal shift.

There is a need for change in the freight and services sector also. Each tonne of freight transported by rail produces 76% fewer carbon emissions compared with road.[196] Smaller and lighter Powered Light Vehicles (PLVs), such as mopeds, motorcycles, micro cars, and micro vans, use less road space, easing congestion, and are more energy-efficient over their life cycle. We should support the development and promotion of more micro-hubs to reduce emissions locally through greater use of cargo-bikes for deliveries.

Quantified carbon reduction is expected to be a target in the next round of Local Transport Plans. A straight switch to EVs is not the right solution for many areas as congestion is a big issue. Focus is needed on the local economy; what we want our places and communities to look like and on reducing the need to travel. However, there is still too much focus on transport-only solutions. A report into last-mile deliveries and local perspectives reveals that local authorities lack the people, skills/knowledge and capacity to tackle these issues[197].

Reducing embedded carbon and "sweat the assets"

There is a big gap around addressing the embedded carbon in transport infrastructure. We need to "sweat the assets": minimise what we build and increase car and charge point sharing. We need to make better use of all resources and move to a more circular economy,

Decarbon8 & UKRI Engineering and Physical Sciences Research Council demonstrate that the carbon implications of infrastructure have not been adequately considered in strategic cases advanced to date[198]. There has historically been too little focus on the carbon in our roads. ADEPT Live Labs II, a three-year programme running until March 2026, focuses on decarbonising the highways asset including materials, street lighting and corridors.

Government's predominant focus is on vehicle tailpipe emissions rather than vehicle life emissions. Zemo Partnership promotes the reduction of emissions throughout the life cycle of vehicles by embedding life cycle GHG metrics into the formulation of transport policy.[199]

iii) Pricing properly for carbon

We must price for carbon properly. We must incentivize consumers to lower their carbon footprint. Pricing also generates revenues to mitigate negative social impacts. Personal carbon allowances and other approaches should be explored. We need an honest conversation about road taxation.

> ***"If carbon were properly priced then people would quickly seek ways to use less of it or to find substitutes. Whilst such policies can be hard to sell politically the immense advantage of carbon pricing is that it would generate new revenue which can be used to help redress unfairness"[200].***
>
> *Professor Stephen Glaister CBE, Greener Transport Council*

The result of repeated failures of road taxation to cover externalities is that we over consume roads.

The fuel duty escalator was first introduced in 1993 as an environmental tax, to stem the increase in pollution from road transport, but continued freezes and cuts to fuel duty have undermined its effectiveness. Greener Journeys showed that freezing fuel duty 2011-2019 caused a 5% increase in traffic and an extra 5 million tonnes of CO2[201].

Existing forms of motoring taxation, principally fuel duty and vehicle excise duty, do not cover the full external costs. The average driver in the UK lost 61 hours due to traffic congestion in 2023, a four-hour increase from the previous year.[202] Traffic congestion costs the UK economy more than £7.5 billion a year.[203] Moreover, the Office for Budgetary Responsibility (OBR) has shown that increased take-up of electric vehicles will cost the UK Government £13 billion a year in lost fuel duty revenues by 2030. This equates to around 4% of overall tax receipts in 2021–22.[204] A replacement source of revenue will be required.

The switch to EVs provides the chance for a public conversation about road taxation.

Greener Vision has proposed a national road pricing scheme[205]. Government should signal that from 2030 fuel duty and VED will be abolished and replaced by a mandatory road user charge based on distance and congestion which will apply to all road vehicles. To be politically deliverable the scheme should be implemented in stages, with road users incentivized to opt in ahead of the charge becoming mandatory.

The charge should be independently determined and monitored, should not in aggregate cost more than current system and may save users money if they travel at less congested times. The recommendation to move away from VED shifts the burden of taxation away from fixed annual costs towards variable costs. Shifting the burden away from ownership to use increases the propensity to walk, cycle or use public transport.

Personal carbon allowances and other approaches should be explored.

Studies show the overall impact of a carbon tax doesn't need to be regressive as its revenue can be returned to households in ways that promote progressivity.[206] Greener Vision has proposed a universal carbon allowance funded by putting a carbon price on everything we consume[207]. Individuals on higher incomes would pay more in carbon tax through the goods and services they buy but receive the same fixed allowance as those on lower incomes. Higher income households consume three times more carbon than those on lower income[208]

iv) Ensuring a fair and just transition

Too many people are being left behind in the transition to net zero. An equitable approach will be essential to maintain public support. Targeted support should be provided for low-income households. Greater focus is needed on improving sustainable transport networks.

> ***"How about we focus on building radically more infrastructure for walking, cycling, micro mobility, and local sustainable transport? This would be a better way to decarbonize transport and deliver on social justice issues at the same time."***
>
> *Pathways to Net Zero Roundtable: Wider Economy, March 2022*

The predominant focus of the government's transport decarbonisation strategy is the roll out of electric vehicles (EVs), which are bought by people on higher incomes.

The upfront cost puts EVs out of reach for most consumers: a new electric car cost around 40% more than an equivalent ICE vehicle in 2023.[209] Poor access to reliable charging is another key barrier to potential electric car and van buyers. Between 25% and 40% of households in the UK have no access to off-street parking and must rely on the public charging network.[210]

The total number of public charge points is not keeping pace with the number of EVs projected to be on the road. Government need to increase the pace of EV charge point installation, especially where charge points might not be commercially viable. The unfairness in VAT charging between private and public charge points must also be addressed. Public charge points are charged VAT at 20%, compared to 5% for private chargers. This means that consumers are financially penalised for not having a private driveway or garage.

A socially just approach will involve greater focus on improving public transport.

The relative costs of motoring and public transport create an unfair transport system. Over past 20 years the cost of motoring has fallen in real terms by 15% whilst the cost of rail fares has risen by 20% and of bus and coach fares by 40%.[211]

A quarter of households and half of workless households have no access to a car. A 10% reduction in access to public transport is linked to a 3.6% increase in social deprivation[212]. At the same time, decades of car-centric planning have left many low income households with no alternative to car travel.

A long-term skills and retraining strategy and support for SMEs will be needed.

The transition to net zero will see new green jobs created in some areas, such as zero emission vehicle manufacturing and infrastructure. But jobs and livelihoods will be lost in others which will affect people working for example in the fossil fuel sectors.

Decarbonising transport poses difficulties for parts of the sector. SMEs, which include around 85% of freight operators, face high upfront costs in investments in, for example, zero emission vans. Freight operators face additional challenges, as they generally operate under tight profit margins. They may require funding support from the public and private sectors.

v) Strengthening delivery across the UK

Greater devolution would drive faster delivery of UK wide net zero targets. Government should enable local areas to plan and invest on an integrated long-term basis. We need to reform governance, funding and appraisal and support collaborative working across wider regional areas.

> ***"Planning of the past has been complicit in shaping the present in which we now confront the stark reality of dependence on a transport system, the considerable direct and indirect emissions of which are no longer tolerable. Planning of today and tomorrow will in turn have long-lasting ramifications for society. How we now plan is therefore no less important in the fight against climate change for the decades ahead, for future generations."***
>
> *Professor Glenn Lyons, Greener Transport Council*

Moving to devolved long-term financial settlements for local areas is a key priority.

More progress on net zero can often be made through place-based solutions. It is easier at a regional level to break down government silos and develop integrated strategies. We need to reform funding and governance so that local leaders can plan for housing, jobs and transport on an integrated long-term basis with net zero at the heart of decision making.

Too often local leaders have been reliant on ad hoc project-based funding streams. Bidding is inefficient, labour intensive and militates against joined-up planning and decision making. There is a major lack of resources, skills and knowledge base at local level. The new focus and direction for devolution[213] will address some of these issues but careful thought must be given to the resource implications of organisational changes.

Consistency on funding, policy and messaging is needed to deliver behaviour change

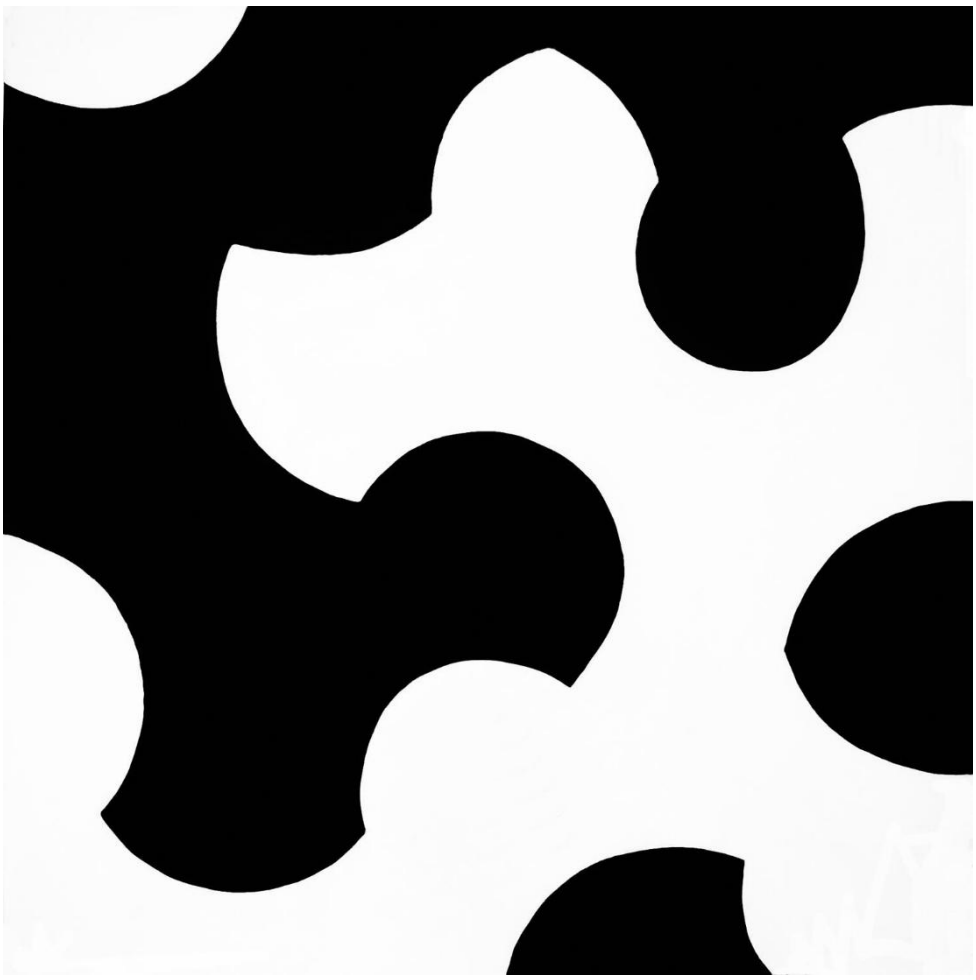
Various policy levers can be used to affect behaviour such as parking charges, congestion charging, LTNs, use of bus lane powers, Workplace Parking Levy (WPL), moving traffic offence powers and clean air zones. However, in addition to tools and policy levers local authorities need incentives and political support. There can be little prospect for any radical divergence in approaches to traffic levels locally if there is no commitment nationally.

It is also important to think about interface with the Strategic Road Network (SRN) run by National Highways. It is the SRN, not local roads that is causing most carbon emissions from road vehicles. Local authorities need to work closely with National Highways which can be challenging because most of the time a vehicle is going through an authority.

We need to reform appraisal. We should prioritise carbon reduction and move beyond narrow frameworks of cost-benefit analysis.

Existing methods bias projects towards the most easily appraised outcomes such as faster journeys, rather than harder to identify objectives such as integrating housing, jobs and transport. The transport metrics of time savings skew policy towards road building.

We need to move beyond narrow frameworks of cost-benefit analysis. Greater emphasis should be given to co-benefits such as improving health and well-being, enhancing bio-diversity, creating jobs, reducing poverty, stabilising the economy with increased focus on risk and resilience and the ability to adapt to climate change.



Tabula Rasa XVI, 1995-2015, acrylic on board, 92x92 cm

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[27] **VUCA is an acronym based on the leadership theories of Warren Bennis and Burt Nanus**, to describe or to reflect on the volatility, uncertainty, complexity and ambiguity of general conditions and situations
[28] https://www.iea.org/topics/energy-efficiency
[29] https://carbontracker.org/new-data-highlights-widening-gulf-between-oil-and-gas-company-plans-and-climate-science/
Carbon Tracker assessed 30 of the world's largest upstream producers and evaluated them on six key metrics including investment options, recent sanctions, production plans, greenhouse gas and methane emissions targets, and executive remuneration.
Each business was then given a grade, with 'A' being the highest and 'H' the lowest. None of the companies analysed scored higher than a 'D', and no company excelled across more than one of the metrics.
The report highlights that despite global efforts to transition to cleaner energy, including a global pledge to triple renewable energy capacity by 2030, many of the largest oil and gas producers are increasing fossil fuel production and approving projects incompatible with the Paris Agreement. They have largely been more bullish about doing so since Trump was inaugurated in January.
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The Net-Zero Banking Alliance (NZBA) has confirmed the results of a key vote by its members, formally dropping the requirement for banks to set climate targets aligned with limiting global warming to 1.5C and reaching net-zero emissions by 2050.
The NZBA, a UN-backed climate coalition, was launched in 2021 as part of the Glasgow Financial Alliance for Net Zero (GFANZ), with the aim of aligning global banking activity with net-zero emissions by 2050. This move marks a significant softening of the Alliance's original climate commitments. In place of mandatory alignment with the 1.5C target, the NZBA will now recommend that member banks align their strategies with the broader goal of keeping temperature rise "well below 2C, aiming for 1.5C," in line with the original language of the 2015 Paris Agreement. The vote, backed by an overwhelming majority of the Alliance's 129 members, effectively converts key climate requirements into non-binding "best practice" guidance.
In recent months, six major US banks — JPMorgan Chase, Goldman Sachs, Wells Fargo, Citi, Bank of America and Morgan Stanley — exited the Alliance amid mounting scrutiny from Republican lawmakers and criticism of climate-aligned finance as part of a broader backlash against (ESG) initiatives
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World scientists' warning: The behavioural crisis driving ecological overshoot - Joseph J Merz, Phoebe Barnard, William E Rees, Dane Smith, Mat Maroni, Christopher J Rhodes, Julia H Dederer, Nandita Bajaj, Michael K Joy, Thomas Wiedmann, Rory Sutherland, 2023

A human behavioural crisis is at the root of climate breakdown. Unless demand for resources is reduced, most climate solutions just tackle symptoms not causes. Climate breakdown is a symptom of ecological overshoot which in turn is caused by the deliberate exploitation of human behaviour.

The 3 levers of overshoot are consumption, waste and population. Humanity would currently need 1.7 Earths to maintain consumption of resources at a level that the planet's biocapacity can regenerate. The best strategy to counter overshoot would be to use the tools of the marketing, media and entertainment industries in a campaign to redefine our material intensive socially accepted norms. Current interventions are largely physical, resource intensive, slow-moving and focused on addressing the symptoms of ecological overshoot (such as climate change) rather than the distal cause (maladaptive behaviours)

The 3 drivers of the behavioural crisis – economic growth, marketing and protonatalism. Whilst behaviours driving overshoot were once adaptive they have become distorted and extended to the point where they now threaten the fabric of complex life on Earth. **"Simply, we are trapped in a system built to encourage growth and appetites that will end us."** The scientists call for increased interdisciplinary collaboration between the social and behavioral science theorists and practitioners, advised by scientists working on limits to growth and planetary boundaries.

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