

businessGreen



SECRETS OF THE PIONEERS

Delivering a Decade of Green Growth

2017



GREENHOUSE



FOREWORD

For the green economy, the past decade has been one of historic success and rapid transformation, as well as frustrating setbacks and time-consuming delays.

It saw the energy market commence an industrial revolution that heralds the end of the fossil fuel age, as renewables costs plummeted and corporate giants embraced decarbonisation. It saw electric vehicles evolve from glorified golf buggies to ultra-desirable Teslas. And it saw world leaders commit to building a net zero emission economy, even as America put a climate sceptic in the White House.

If anything, the next decade promises to be even more eventful.

This year is the 10th anniversary of both BusinessGreen and Greenhouse PR, the specialist communications agency which supports businesses, entrepreneurs and campaigners who are working to create a green economy. To mark the occasion we have teamed up to speak to some of the sector's leading pioneers, uncovering the lessons they have learned from this most exciting of decades and sneaking a glimpse of what the next ten years could bring.

From Christiana Figueres and Sir Ian Cheshire to Lord Stuart Rose and Sir Jonathon Porritt, we spoke with some of the political and business figures who have helped drive the emergence of a greener economy and establish the global low carbon transition as a mainstream concern.

Their insights were as varied as they were revelatory, but some trends emerged. All highlighted how the next decade will be critical to determining whether the world avoids the worst impacts of climate change, just as they stressed how deep decarbonisation is now fully compatible with economic goals. And they each provided some excellent investment tips.

But most of all, the pioneers of the green economy emphasised the message BusinessGreen has spent the past decade attempting to impart: the business community is absolutely critical to tackling the environmental challenges we all face.

Or, as Dr Emily Shuckburgh of the British Antarctic Survey put it when asked if the world could still avoid 2C of warming, "I have always said business is key to this - if the business community responds, we can do it".

James Murray

Editor-in-Chief of BusinessGreen

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The following interviews were carried out throughout August, September and October 2017.

CLAIRE PERRY

Where were you in 2007?

In 2007, within six months, I went from being an at-home caregiver involved in various local environmental initiatives to a policy adviser to the then-Shadow Chancellor George Osborne. It was an eventful year, but one that made me especially conscious of the personal and societal opportunity of getting women to return to the workforce after a career break.

We are living through a massive economic transformation driven by decarbonisation.

Where do you expect to be in 2027?

I have no idea where I will be in 2027. I have never been one for life plans, but I hope to be still doing something I love and doing my best to deliver good results. I do expect it to be an incredibly exciting decade though. We are living through a massive economic transformation driven by decarbonisation.

What is the most important lesson you have learned over the past 10 years?

I have three.

Never say no to exploring an opportunity, no matter how unlikely it seems.

Say less and do more.

Love, family, friends and good health are the secret to a happy and productive life.

What is your vision for the green economy in 10 years' time and what do we need to get us there?

My vision, and that set out recently in the government's Clean Growth Strategy, is for a green economy that creates opportunities across the whole country – new jobs, technologies and businesses – while cutting costs for consumers and contributing to our climate change targets. To make this happen we need to build on Britain's strengths in science and innovation – that is why we've committed £2.5bn to low carbon innovation.

By focusing on clean growth, we are presented with a win-win situation.

What will be the biggest changes from today's world?

It's impossible to predict the technological breakthroughs that could change the world over the next decade, but it's easier to see some of the areas where change is needed.

This year I think we've seen a real shift in attitudes to low emission vehicles and, with greater innovation from carmakers and continued investment in infrastructure, transport is one area that will look significantly different in 10 years' time.



Claire Perry is Minister for Climate Change and Industry at the Department for Business, Energy and Industrial Strategy.

Elected to Parliament in 2010 to represent the Devizes constituency in Wiltshire, she has previously served as parliamentary private secretary, a government whip, and rail minister.

One of the most notable events during her time as Climate Change Minister has been the launch of the long-awaited Clean Growth Strategy, which sets out over 162 pages the government's plans to deliver deep decarbonisation across the UK economy.

What top three sustainability challenges will be top of the agenda in 2027?

There will be big challenges in decarbonising the way we heat our homes, helping heavy industry go carbon light and ensuring energy is affordable.

But I think that part of the reason the UK is considered a leader in tackling climate change is that we don't just see these as problems to be solved, but as opportunities.

By focusing on clean growth, we are presented with a win-win situation. We can cut the cost of energy, drive economic growth, create high value jobs right across the UK and improve our quality of life.

Will the world be on course for two degrees?

PwC's recent Low Carbon Economy Index, published last month, found that the UK and China are the only countries to have reduced their carbon intensity in line with the two degrees goal.

The Paris Agreement marked a clear turning point towards a low-carbon future, but it is clear current commitments only take us around halfway towards the two degrees goal.

One of the main ways Britain can help keep the world on course is by building on our existing strengths in green finance to ensure the investment is there to support countries in meeting their targets.

If you could invest in one clean technology through to 2027 which would it be and why?

There is no magic bullet here. My focus as a government minister is on creating the best possible environment for low carbon innovation and investment.

As we've seen with offshore wind, the approach of allowing technologies to compete with one another drives down costs for consumers and has made the UK a global leader in the sector.

What advice would you give to a sustainability professional starting their job today?

I'd like them to read our Clean Growth Strategy!

I recognise that government doesn't have all the answers and can't achieve all the changes needed to create a truly green economy by itself.

I'd be really interested to hear the views of young people starting out in the sustainability profession and hopefully to work with some of them, as we introduce Green Great Britain Week next year to involve as many people as possible in tackling climate change and improving air quality.

Are you optimistic or pessimistic about the future?

I'm optimistic. The UK should be very proud of our record to date.

We were one of the first countries to recognise both the economic and security threats posed by rising sea levels and rising temperatures.

We have followed the guidance provided by that scientific understanding with action.

Since 1990, we have cut emissions by more than 40 per cent while our economy has grown by two thirds over that time. On a per person basis, this means that we have reduced emissions faster than any other G7 nation.

We now have a great opportunity to build on this progress.

CHRISTIANA FIGUERES

Where were you in 2007?

I was living and working in Washington DC, working on climate change and preparing for the Copenhagen summit of 2009.

Where do you expect to be in 2027?

I expect to be back home in my homeland of Costa Rica, living somewhere very close to the ocean.

“Impossible is not a fact, it is merely an attitude. If any task is important enough there can never be a barrier high enough to stop us from achieving that task. With radical collaboration and stubborn optimism everything that is important is possible.”

What is the most important lesson you have learned over the last decade?

I have learned that impossible is not a fact, it is merely an attitude. If any task is important enough there can never be a barrier high enough to stop us from achieving that task. With radical collaboration and stubborn optimism everything that is important is possible.

What is your vision for the green economy in 10 years' time?

My vision is that we will have a world in which we have energy for everyone, and emissions from no one. That we will have energy that is clean, cheap, reliable and unlimited. We will have transportation that is clean, efficient and shared. We will have food security guaranteed for all. We will have the green economy being the powerhouse, lifting the poor out of misery and contributing to further development in developing countries.

What will be the biggest changes from today's world?

Well, the change towards clean energy for sure, that is already underway. The change toward electrified transportation, that is also already underway. In addition, the digitisation that we are seeing in so many different industries will change the way we interact with each other and in fact will even change the meaning of work.



Christiana Figueres is the former executive secretary of the United Nations Convention on Climate Change (UNFCCC). Assuming the role just after the failed Copenhagen summit in 2009, she re-energised international enthusiasm for climate action and was a key broker of the Paris Agreement in 2015, a landmark treaty between almost every nation on Earth to take radical action to fight climate change.

Figueres now lives in London and is the convenor of Mission 2020, a global initiative that seeks to ensure the world bends the curve on greenhouse gas emissions by 2020 in order to protect the most vulnerable from the worst impacts of climate change and usher in an era of stability and prosperity.

In 2017 she received BusinessGreen's Lifetime Achievement Award.

What top three sustainability challenges will be top of the agenda?

I believe that in the year 2027 we will have three sustainability challenges. Number one, water. Number two, water. Number three, water.

***“Choose one field that you are absolutely passionate about and understand that everything which is a barrier today is not a barrier tomorrow. Your job is precisely to remove those barriers to move us into the new technologies and a new livelihood of the 21st century.*”**

The fact that climate change is changing the hydrological cycle that we have had for hundreds of years means we will not have enough clean water in areas that are currently inhabited. Which means we will have to desalinate water, and we will have to do so at low cost, which is currently not the case.

That is perhaps the most difficult of the adaptation measures, but we will also have many other adaptations that we are going to have to make in order to respond to the increasing pounding of climate change through more hurricanes, more floods, more droughts. So everything that is adapting our infrastructure and our livelihood to a very changed natural environment is going to be top of our sustainability challenges.

Will the world be on course for two degrees?

Yes, I believe the world by 2027 will be on course to stay below 2C.

If you could invest in one technology through to 2027, which would it be and why?

I would invest in any technology that uses any surface to produce energy. Currently we have thin film solar, which hasn't taken off yet, but I believe that all our surfaces will be turned into energy generators for the building that they harbour, and I would invest in that.

What advice would you give to a sustainability professional starting their job today?

Choose one field that you are absolutely passionate about and understand that everything which is a barrier today is not a barrier tomorrow. Your job is precisely to remove those barriers to move us into the new technologies and a new livelihood of the 21st Century.

***“I’m optimistic, because I do feel that we will end up with a more secure, a fairer and a more stable world. But that doesn’t mean that there is not a lot of pain ahead.*”**

Are you optimistic or pessimistic about the future?

I'm optimistic, because I do feel that we will end up with a more secure, a more fair and a more stable world. But that doesn't mean that there is not a lot of pain ahead. I think we will still hit bottom before we can come up again, and the bottom will be produced by the more frequent and more intense impacts of climate change on every single country in this world. We will get through it, but at a high cost.

LORD NICHOLAS STERN

Where were you in 2007?

I came in to the sector as someone who has spent their life in economic policy. I was in the Treasury in 2007, but I had just spent 10 years as a chief economist - first of the European Bank for Reconstruction and Development and then the World Bank. Prior to that, I had been an academic all my life.

In 2005 I was asked by Gordon Brown and Tony Blair to look at climate as a big policy and economics question. I started work in the summer of 2005 right after the G7 summit in Gleneagles, where we'd had Africa and climate change on the agenda. I had written the report for the Commission for Africa and we'd made good progress, but on the other subject we had made very.

We decided one of the reasons for this was that we hadn't seen climate change strongly enough as an economic subject. We had seen it as an environmental issue and a long way down the track, and people's minds weren't focused.

So that's how it started, and as soon as I got deeply into the subject it became crystal clear to me just how big the risks were. It was a huge economic issue, and more than that, it began to be clear that if we went down different routes towards a low-carbon economy that is much less polluting, much less wasteful, then that is a very powerful growth story.

Can we see the connection between the environment and the economy much more readily now?

I think that's absolutely right – that is the big change of the last 10 years. We would not have got the Paris Agreement in December 2015 without the deepening understanding that this was the growth story.

In the longer term there is no high-carbon growth story – it creates an environment so hostile it chokes off and reverses economic development.

Essentially sustainable infrastructure drives growth. It drives growth now in terms of improving demand and sharpening up supply. Over the medium term the whole story of the low-carbon economy sparks off a great wave of technological change, what economics historians call a Schumpeterian wave of economic change, after Joseph Schumpeter who wrote about creative destruction and waves of technological change. And in the longer term there is no high-carbon growth story – it creates an environment so hostile it chokes off and reverses economic development.

If you ask me what the big change in our understanding has been, it's exactly that. It's come through studies, it's come through our experience of how bad high-carbon growth can be in terms of pollution and congestion and so on. It's probably too early to declare complete victory in that argument, but it is pretty well established now. And that's been key.



Lord Nicholas Stern is the chair of the Grantham Research Institute on Climate Change and the Environment at the London School of Economics. He is the author of the Stern Review, a seminal report commissioned by Tony Blair and Gordon Brown into the economic impacts of climate change.

He was knighted for services to economics in 2004, made a cross-bench life peer as Baron Stern of Brentford in 2007, and appointed Companion of Honour for services to economics, international relations and tackling climate change in 2017.

He has published more than 15 books, including his most recent, Why are We Waiting? The Logic, Urgency and Promise of Tackling Climate Change.

What's the most important lesson you have learned in the last decade?

That this is a very attractive growth story. This is not about sacrificing something for the environment. This is about actually growing and developing, reducing poverty and building more inclusive societies in a very different and more attractive way than we have done in the past.

What needs to happen by 2027?

In terms of emissions we should have been going down strongly as a world for six or seven years. In 20 years' time we need emissions at least 20 per cent lower than now, so we should be at least halfway there 10 years from now.

We should essentially be phasing out the internal combustion engine, because if for example you're not going to sell them any more in India by 2030 then by 2027 the whole industrial structure will have to be changing. So by 2027 the combustion engine has to be on the way out. I think you will also see city centres which are better managed so congestion and pollution are far less. In terms of cars, roads and city management, we are going to see dramatic change.

I think by 2027 we have to have a much better understanding of how we can go negative, because we've got to go carbon zero 50 years from now. And if we are going to be carbon zero we have to have quite strong areas where we are carbon negative, because you are going to have some places where there are carbon positives. We had better prepare for it now.

Do you think we will be on course for two degrees?

I think there is a good chance, coupled with a great risk we might not be. We've got ourselves in a position now where we can make it. I'm very optimistic about what we can do, I'm much more cautious about what we will do.

What role will you play over the next 10 years?

I'm going to be involved in the whole story of sustainable infrastructure. Because all this is set in the context of the global agenda of 2015, which is the Sustainable Development Goals (SDGs) and the Paris Agreement, and sustainable infrastructure is absolutely at the core.

Self-drive cars will actually mean we build fewer cars, because they will be working all the time rather than just sitting on drives.

When we talk about sustainable infrastructure we are talking about energy, transport, water, the design of cities. A big part of that new investment in infrastructure is going to be in emerging markets and developing countries. My own work will be focused in large measure around fostering and financing sustainable infrastructure, because quantitatively it's so important to what we have to do. Public policy, the reduction of uncertainty and risk, and bringing forward the right kind of finance at the right time is absolutely crucial.

I have also been very involved in the Global Challenges Research Fund and the Industrial Strategy in the UK, and I would like to stay closely involved in that.

If you could invest in one clean technology through to 2027 which would it be and why?

I'm very cautious about the one shot, because all our infrastructure has to be sustainable from now on, whether it's in energy, transport, water, or the design of cities.

If I could name two areas though it would be solar and wind, in the context of the management of the whole electricity supply. I also think there is huge progress in resource efficiency and the circular economy. Self-drive cars will actually mean we build fewer cars, because they will be working all the time rather than just sitting on drives.

But beware the one shot story, because this has to operate across the whole economy.

If you could give some advice to someone starting out today, what would you tell them?

I'll say what I say to my students: get some skills. I'm in the economics profession so I encourage them to go and get some post-graduate skills in economics, so that they will be very good at helping with public policy. If they are going to be really creative engineers I would again encourage them to go and get really good, relevant high-level skills.

So my advice to young people would be to first really invest in the skills they can bring to the world and then get experience in changing things and being entrepreneurial.

JOSH HARDIE

Where were you in 2007?

I was at Tesco at the time, and over time one of my areas of focus was on Tesco's footprint and wider environmental concerns.

It was very interesting watching these trends from the Tesco perspective, and how Tesco looked at it both in terms of social impact and the almost unflinching duty to reduce its impact, but also from the customer dynamic and how you actually change customer behaviour.

I think it has also been a decade of major shifts for CBI members. In 2008 we did our first report which was called 'Everyone's Business', and that feeling that you could get businesses round the table and they would really engage in the issue and look across the economy was starting to emerge.

The way you tackle environmental impacts in a business isn't just a CSR activity. It's not just about tree planting, it's about looking root and branch at your business activities.

So the moves from business have been very good, and still carry on. With government, clearly there have been notable successes. The 2008 Climate Change Act was ground-breaking. I think we can be pleased with the influence we have had on the EU ETS and the Paris Agreement. I think there is lots for the UK government to be pleased about. In the heyday when things were really moving I think it did feel like a genuine partnership.

I think also when you look at consumers it's been interesting. On the one hand, there's no question there's been a dramatic shift in terms of consumer awareness. You can point to some very clear areas of behaviour change, for example recycling or tech and measurement. But it's been tough. During this decade we have also had the financial crisis and austerity. That has quite naturally changed people's priorities. But I don't think of it as a case of things getting jolted off course, because I think that's life.

Whatever decade you pick there are going to be seismic events, the challenge and the opportunity is to find ways of keeping business, government and society engaged as they occur.

How have you seen the relationship between business and corporate responsibility develop?

Swings and roundabouts! On the one hand if you look at the journey businesses have been on in terms of understanding societal expectations and understanding social impact, the last decade I think has seen really significant progress. Businesses' sustainability policies I think in many ways have been the flagbearer for that.

Partly it's been down to the understanding that the way you tackle environmental impacts in a business isn't just a CSR activity. It's not just about tree planting, it's about looking root and branch at your business activities. So you've got to look at the energy being used, you've got to look at the way you transport your goods, you've got to look at your production. So in that sense if you are a business that is going to look at this issue it is a whole business conversation.



Josh Hardie is deputy director-general for policy and campaigns at the CBI. Josh joined the CBI in 2016 to head up the business group's policy development and influencing work.

Before joining the CBI he was group director for corporate responsibility at Tesco, where he led on the integration of social and reputational issues into the retailer's business strategy.

Josh Hardie has also held executive roles at EdComs Ltd creating strategies and campaigns for high-profile clients, including Sky, Google, the Army, the NSPCC, and many government departments.

But the trust between business and society is not as strong as it has been in decades past. That's a cultural thing – it's true of politicians, it's true of the media, it's true of the relationship between society and institutions generally. But businesses are very alert to that and very keen to understand how we can a) improve our impact and b) talk about what the point of us is in a more effective way. That's what I mean by swings and roundabouts – there's been a lot more progressive action, but our environment and that relationship still needs real work.

How do you propose to address that shortfall?

We have got to be absolutely clear, the first thing comes with understanding society's expectations and making sure business behaviour meets that. And the vast majority of businesses are in that position, but when you get instances of individual businesses behaving badly, that damages trust in everybody.

Once you have got good behaviour in place, communication matters. It is very interesting the way businesses talk. And too often businesses talk in a way that people don't understand. Whether that is about topics like energy, or whether it is about topics like what the business is there for, there is a real challenge for businesses to make what they do and the topics they talk about relevant, accessible, engaging and understanding, and to not talk in business speak all the time.

So if you put those two things together – a clear understanding of expectations and of meeting them, and a voice that people are interested in and understand, I think those are two of the cornerstones of building trust.

What is your biggest achievement of the past 10 years.

I think the shift in businesses not asking the question 'what's the benefit to us to act on this social issue', to the belief that actually, this is what business is here to do. And we as business are part of this challenge, and we are going to lead the way on this challenge.

That genuine commitment to trying to solve the problem is for me the most satisfying thing, because that's not so clear and not so comprehensive in many areas as it is in energy and climate change.

What are the core challenges facing the shift towards green business at the moment?

I think the biggest challenge at the moment is simply long-term certainty in the policy environment. It has slipped back, and that doesn't help. There's enough uncertainty that's outside of our control at the moment – let's control what we can control.

The second one is slightly more complicated, and that is how we have an honest conversation about cost. Budgets are tight. Too many people in society are struggling. We know that and absolutely recognise that. At the same time, if we want to push forward on a greener agenda we have to be able to have an open conversation about what that does and doesn't cost.

You see other countries such as Germany doing that rather well – we need to be able to have that conversation.

Paint us a picture of the kind of world you would like to be living in in 2027

For me, the thing that gets me excited is the technological aspect. I would expect and I am confident business will continue on the journey around their own emissions.

Where I would love to see real innovation, real change, is in homes and transport. The things that, for us as consumers, are everyday life. There are tools we can engage with because they are interesting, because they help us live our lives better, because they are convenient, because they make things easier for us, but also because they help us to live more environmentally friendly lives.

This is not just about how we drive greater change in sustainability. It's about what sort of future economy we want, what the UK is going to be brilliant at when we have left the European Union and we are doing trade deals abroad. We need to understand what our competitive advantage is going to be. And it should be in those areas.

EDWARD MASON

How would you describe the journey of green finance over the last decade? Has it finally hit the mainstream?

It depends what you mean by green finance. There's the greening of finance generally and the creation of specific investment vehicles to fund green investments.

There have been very significant steps forward in making environmental issues part of investment decision-making over the last decade. For example, the 62 per cent vote last year for better climate change related disclosure by ExxonMobil which was embraced by the world's largest asset managers, the increasing popularity with institutional investors of sustainability focused and low carbon investment products, and the growing voice of investors on sustainability and climate policy with the pre-Paris Global Investor Statement on Climate Change signed by investors representing more than \$24tr in assets and the IIGCC now having a measurable impact on EU policy.

“Asset owners matter. When it comes to sustainability, in the long term, we've nowhere to hide because our returns are dependent on the health of the economic system as a whole.

But we are a long way from sustainability considerations being fully integrated into our economic, business and investment models. There is plenty more work to do. Reconciling our economic life with planetary boundaries is a journey and we are still in the early stages.

As an endowment the Church Commissioners are generally not fixed income investors and green finance has been very much focused on green bonds. These seem to be making strong progress but it is clear that we are a long way from achieving the level of investment required for the low carbon transition and achievement of the SDGs.

This is as much, or more, a challenge for policy makers as investors. Investors make their decisions based on their fiduciary responsibilities and risk/return criteria. Sustainable investments can stand up in their own terms but so can unsustainable investments, and public policy is the most effective way to get environmental damage priced in and to create the right economic incentives so that capital naturally flows at the scale required to sustainable rather than environmentally myopic investments.

What is the most important lesson you have learned over the past 10 years?

Asset owners matter. When it comes to sustainability, in the long term, we've nowhere to hide because our returns are dependent on the health of the economic system as a whole. While companies are focused on keeping their businesses profitable, politicians on winning the next election, and asset managers on keeping their mandates and staying in the best buy tables, asset owners have a requirement to be able to generate returns long into the future.

Asset owners are increasingly using their voice. When we do, and particularly when we work together, we can have a sizable impact, both directly on companies and policy makers and indirectly by spurring action by asset managers who control huge amounts of capital.



Edward Mason is head of responsible investment at Church Commissioners for England and is tasked with ensuring the church implements its ethical and responsible investment commitments.

He took up the position in August 2014, having previously served for five years as Secretary of the Church of England Ethical Investment Advisory Group (EIAG). Prior to working at the Church of England he served for 15 years as a British diplomat, leaving in 2005 to help establish the diplomatic advisory group Independent Diplomat.

What impact will the Taskforce for Climate-related Financial Disclosure (TCFD) recommendations have on the mainstream investor community's attitude to climate risk?

The TCFD recommendations have given additional profile to the issue of climate risk and its potential financial materiality. My sense is they have been received most enthusiastically by those investors already concerned about climate risk, who will lead investor advocacy of the implementation of the recommendations. Nonetheless, I am optimistic that the impact of the recommendations will be significant.

It is particularly significant BlackRock were involved in the Taskforce and will be advocating the implementation of the TCFD's recommendations in their engagement with companies. Uptake does not get more mainstream than that.

The key benefit of the TCFD report is it gives a common disclosure agenda around which investors can unite, and it will not require many large players pushing for implementation for companies to conclude that they need to act. The recommendations are also a disclosure agenda around which regulators can unite, and if they do, uptake will be faster and more widespread.

What is your vision for the green economy in 10 years' time and what do we need to get us there?

In 10 years' time, I hope to see us long past the peaking of carbon emissions and a clear downward trend established. I'd like the integration of sustainability considerations into business strategy to be normal practice and companies

that do not do this punished or at the very least challenged by the markets. I want to see technological innovation making the sustainable choice the rational economic choice, indeed giving us a range of sustainable choices for our many environmental challenges.

To get there we need a relentless focus on climate change and sustainability from citizens, NGOs, the media, asset owners, asset managers and businesses - which will keep politicians focused too. We need innovation and investment in it from businesses, governments and foundations. We need all that is best in the human spirit.

If the numbers don't stack up the market economy cannot solve environmental and social problems. It is society's job collectively to make sure the numbers stack up.

What top three sustainability challenges will be top of the agenda in 2027? How will investors contribute to tackling them?

Water stress. Climate change. Air pollution.

These are huge challenges, which investors will need to contribute to tackling through their function of investing with a view to achieving their required risk-adjusted returns – just as businesses will need to contribute by investing with a view to achieving their desired return on capital and earnings growth.

While investors can do a number of other things - draw attention to issues, seek and improve disclosure, engage to improve corporate attention to sustainability issues, call for public policy changes, do their utmost to seek out positive investment opportunities and continue to develop sustainable and impact investing – if the numbers don't stack up the market economy cannot solve environmental and social problems. It is society's job collectively to make sure the numbers stack up.

If you could invest in one clean technology through to 2027 which would it be and why?

Batteries. Battery technology is vital to the low carbon economy – for the grid, for electric vehicles, for heavier transport. As batteries become cheaper, more powerful, lighter, smaller, easier and quicker to charge, and safer, the better served we will be – the commercial opportunity is huge.

What kind of world would you like to be living in in 2027?

One where I'm confident about the future for my children and for the poor and vulnerable in developing countries.

Do you think we will be on course to limit warming to two degrees?

I think it is the consensus view that we are not on course to limit warming to two degrees and that getting us on course looks extremely challenging. It is only with the relentless societal focus on the challenge, its urgency and its importance, as I mentioned earlier, that we will have a chance of achieving the Paris Agreement target. This is everyone's responsibility, and the more influence we have, the more responsibility we have to use it.

DR EMILY SHUCKBURGH

Where were you in 2007?

I was preparing to go off to the Antarctic on a research trip. At the time we had a big project to try and understand the circulation of the Southern Ocean. That's important as it absorbs a huge amount of the CO2 we put into the atmosphere. About 30 per cent of the CO2 we put into atmosphere is taken by ocean, and the Southern Ocean is a disproportionate contributor to that. We were going down to the Drake Passage region to take all sorts of measurements.

Where do you expect to be in 2027?

I honestly don't know. Quite possibly back down in the Antarctic. Research dominates my life, so that is where the focus would be. I would most likely be thinking about the Arctic or Antarctic. There will still be big questions in 10 years about their importance in the global climate system and how they are changing. I've been twice to each. I don't go every year, especially with children. I am on a sabbatical as you can't go on trips like that for a short period time.

***“It is very easy in this space to emphasise the doom and gloom, as there is plenty of grounds for that, but that is not very motivating for businesses, or for individuals.*”**

Although my daughter was asked at school the other day what I did and she came home and said “next time you go to the Antarctic can you bring me back a penguin?”

What is the most important lesson you have learned over the past 10 years?

That decade has been the decade of me focusing on the polar regions. I started working there just over a decade ago and until I started studying those regions in detail I had not appreciated the scale of change and the pace at which it can happen.

For example, the Larsen C ice shelf was in the news recently, where this huge iceberg broke off. Calving is a natural phenomenon, but the iceberg that broke off was the size of Luxembourg. In the rest of the world, we just don't see things happen at that scale.

What is your vision for the green economy in 10 years' time and what do we need to get us there?

I do a lot of work through the Cambridge Institute for Sustainable Leadership with businesses. As such, I have had an outsider perspective on what the business community has been doing in this space for a decade. I have really noticed change over that decade, especially in the last couple of years. It has changed entirely.

Ten years ago it was a CSR issue at most. I think that has completely changed. Especially post-Paris there has been much greater understanding of the business community's role and their power to drive forward change.



Dr Emily Shuckburgh, is a climate scientist based at the British Antarctic Survey.

She is also a fellow of the Cambridge Institute for Sustainability Leadership and works extensively with business leaders to promote understanding of climate science.

She is the co-author of the Ladybird Expert book on Climate Change alongside Tony Juniper and the Prince of Wales.

But there has also been more of a recognition – maybe driven by the Bank of England’s recent work – that businesses have a vulnerability to climate change. That wasn’t recognised 10 years ago - whether it is vulnerability in terms of physical risk or investment risk - that is now being engaged with as part of business risk analysis.

I get asked as a climate scientist, do I get frustrated at the lack of action. But my sense is there is a real difference now between public engagement and business engagement. Most of the people I see in the business community get it, and get it to a much greater extent than the wider public, who rely for a lot of their information from a media environment that is very mixed on this topic. Business decisions do tend to be made on a hard assessment of the evidence and a hard assessment of the evidence unveils what a significant challenge we face that we need to respond to.

What do you think the biggest challenge the green economy will face over the next decade will be?

The biggest thing is just the numbers needing to add up. Without wanting to name names of the companies I have worked with, often there is goodwill, but the recognition of the scale of change that is required to be consistent with the Paris Agreement mapping is still a substantial step for some businesses.

There’s been a recognition we need to do something, but not of the scale of the change we need to make. And there hasn’t been that mindset change of what is required.

Will the world be on course for two degrees by 2027?

I have always said business is key to this. If the business community responds we can do it. When businesses put their minds to things they can change things very rapidly.

If you could invest in one clean technology through to 2027 which would it be and why?

That’s a really difficult question. The ultimate challenge is how do we get a population of nine billion people to live an improved lifestyle, so in terms of making a global difference, not necessarily in terms of making money, I’d look at technology that helps improve lives in the developing world and sets them on a trajectory that is cleaner than what we have been through. That means working with local partners in developing countries to develop their own solutions. It’s not a precise answer, but helping the developing world embrace a clean growth future is going to be key to this.

“If we don’t act now on climate change it will come back to bite us. There is this misconception that doing nothing is not a decision. That not reacting in the face of uncertainty is somehow not itself a reaction.”

What advice would you give to a sustainability professional starting their job today?

This is not just for people in sustainability, but the biggest lesson I have learnt is the need for optimism. It is very easy in this space to emphasise the doom and gloom, as there is plenty of grounds for that, but that is not very motivating for businesses, or for individuals.

Are you optimistic or pessimistic about the future?

I waver. I can look at it through an optimistic lens, but I can look at it through a pessimistic lens when you look at some of the science.

Over the last few years we have become increasingly concerned that some of the glaciers that feed the West Antarctic ice sheet could be in irreversible retreat and if that ice sheet collapses that would eventually lead to three metres of sea level rise.

One recent study suggested it could contribute as much as a metre of sea level rise just this century, and that would come on top of the other causes of sea level rise - you could have close to two metres of sea level rise. If you look at a map of the UK you start to see large parts of the country below sea level. I live in East Anglia - you can forget East Anglia.

What’s currently the biggest misconception surrounding climate science?

I think the thing most people struggle with, even the people who are fairly knowledgeable about climate change, is the scale and urgency that is required.

I started working on this in the early ‘90s – I’ve been working on it for a good 25 years – when you say we have a couple of decades to respond I think we have been warning people for a couple of decades already and not much has happened. This is not something we can leave until tomorrow, but that is still the easy thing to do. It is easy to focus on issues like Brexit, we are seeing the UK government do that. But if we don’t act now on climate change it will come back to bite us.

There is this misconception that doing nothing is not a decision. That not reacting in the face of uncertainty is somehow not itself a reaction.

SIR JONATHON PORRITT

Where were you in 2007?

I was Chairman of the Sustainable Development Commission at the same time as Forum for the Future was expanding internationally. The Forum had been going for seven years, and we had just got into this incredibly rich period of engagement with the Labour government doing this real joined-up, delivery-based approach to sustainable development across central government departments and local government. It was amazing. And I look at the government scene now and I think 'oh my God, that was a high point'.

In 2007, for instance, more than 90 per cent of local authorities in the UK had a local Agenda 21 action plan. They had a set of integrated indicators for economic, social and environmental outcomes, which were assessed on an annual basis by the National Audit Office, and regional bodies were really getting their heads around sustainable development.

It was an amazing time, because the government wasn't standing in the way of business - it was actually saying 'this is really important'.

I can't help but compare that with where we are now, because there is nothing happening - literally nothing - from government on this front. It is a complete desert. The coalition government got rid of all the sustainable development architecture.

It wasn't just that they got rid of the Commission itself, they also got rid of sustainable development ministers across government, stopped asking local government to do anything, botched all the regional bodies, and even stopped using the phrase 'sustainable development' completely because it was held to be irrelevant.

In 10 years the entire memory of what sustainable development means as a central guiding principle in government has been obliterated. It's incredible to see.

What did business sustainability look like 10 years' ago?

Good. It was good. There were a few companies doing big-picture, joined-up sustainable development, although it is also timely to remember how fragile, unfought, and naive some of it was - a lot of it was quite disconnected.

The pursuit of economic growth indefinitely into the future on our finite planet is the closest thing we have to modern, species-wide insanity. You don't really hear anybody articulate that in modern politics.

So I think one of the best things over the last 10 years is the degree to which business has upped its game. It has become much more integrated in its thinking, more sophisticated, better able to bring about real change on the ground and through supply chain management, relationships with business partners and consumers and so on. So 10 years' ago it wasn't bad, but it looks quite primitive in comparison to where we are now.



Sir Jonathon Porritt is founder director and trustee of sustainability non-profit Forum for the Future.

He helped set up the Forum in 1996 and has since seen it expand beyond the UK with offices in the US, India, and Singapore.

A leading environmentalist and writer of numerous books on sustainability issues, Porritt worked as director of Friends of the Earth from 1984-1991. He was later appointed by the Blair government to chair the Sustainable Development Commission for two terms between 2000 and 2009.

Sir Jonathon Porritt also became chancellor of Keele University in 2012 and remains an active political campaigner for the Green Party and a number of other causes.

What has been the biggest barrier for companies improving their sustainability credentials?

There is a real barrier here. It is clear companies have to be able to demonstrate the 'business case' because if they can't do that, it is quite hard to actually justify to shareholders this is something that is absolutely in their interests.

We have to think much more broadly about the systems in which those companies operate and how they can combine forces with other players to effect change at a systemic level.

Now some companies have made a better fist of that than others – Unilever, M&S and others have consistently said it is about long-term value creation rather than short-term business benefit today. But many companies have never really got their heads around it and that's proving now to be quite problematic, because the basic ground rules of our capitalist economy have really changed.

The pursuit of economic growth indefinitely into the future on our finite planet is the closest thing we have to modern, species-wide insanity. You don't really hear anybody articulate that in modern politics. You do hear more of it – tempered and a little bit nuanced, obviously – in capital markets and amongst some of the savvier investment houses with people thinking about stranded assets and returns over time. But there's no mainstream challenge to that central premise for what progress for humankind looks like.

What's the most important thing you've learned in the past 10 years?

For us in the Forum there has been a really big set of lessons that we've had to internalise in the last four or five years. The first is that business is a hugely important and significant player in changing the circumstances out there and in improving the current state of play. You wouldn't have said that 10 years' ago, but now you can say that emphatically, and they are right there as a major agent of change in their own right

But they have to operate within the ground rules and that means some of the interventions they make are not really as cost-effective and outcome-effective as they could be, and there are quite severe limitations on what they can actually do. We have to think much more broadly about the systems in which those companies operate and how they can combine forces with other players to effect change at a systemic level.

Also, when I think of the role of business in climate issues, particularly at the time of the Paris summit and the agreement around the SDGs, business was very active in its advocacy work. They were a major influence, succeeding in bringing politicians with them.

So voice is very important, and nowhere is that more important these days than in the USA, where you have now got excruciating dilemmas for many large global companies which are having to work out what to do about a political system and a president that seems to want to reverse much of what they have done over the last 10 years. So that voice issue is crucial.

What do you see as the biggest sustainability challenges for the next decade?

One of the biggest problems we've got at the moment is the debate about climate change has focused almost exclusively on energy, transport, materials, infrastructure – the man made, physical world that we depend on to create wealth. The land-based aspects of climate are much less understood and developed. If you think now about agriculture, forestry, land-use patterns and how we are going to optimise the use of different biomes for different purposes to feed people – to maintain biodiversity and maintain life support systems in soil and so on – we are massively off the pace.

What do you think the green economy will look like in 10 years' time?

It is changing so fast. 10 years ago there were lots of outright cynics saying the green economy was just window dressing and not even worth talking about as a sector in the way we categorise economic activities – it was just a bit of rhetoric for politicians to play around with.

10 years on those cynics have completely disappeared, just by virtue of the scale of market activity under different headings in the green economy. And if you project those growth curves forward, the green economy won't work as a concept in 10 years' time because it will be too bloody big.

So I'm hugely hopeful about that, and what makes me particularly hopeful is that will get investors to re-calibrate their future value in earnings over time in terms of their own portfolios, and that means we should be seeing trillions of dollars of investment flowing into different aspects of the green economy during the next decade. It has to, as we know it's not moving fast enough right now.

JAMES THORNTON

Where were you in 2007?

At that point ClientEarth was just starting up. We were trying to establish that citizens could use law to protect the environment in Europe, because no one had really done that before.

At that time in Europe there was a great interest in the environment and in reducing environmental harm. One of the things we identified though was an enforcement deficit in environmental regulations and laws.

One example was that all the capital cities in Europe that we looked at were violating air pollution standards in a fairly extreme way, to the detriment of people's health. The European Commission was saying that around 400,000 people a year across Europe die early because of air pollution.

So that was an example of a remarkable enforcement deficit. People had agreed air pollution was a very serious matter, they had passed quite decent legislation in Brussels which then was passed in every country, and then not much was done to apply it.

One of the other dynamics was NGOs had become very expert at campaigning and at policy, but they didn't use law very much and because of that they didn't try and enforce law very much. So countries and the EU itself were rather lackadaisical about making sure the laws were complied with.

Where are we now with tackling that deficit?

A number of things have changed in the last 10 years. One of the most dramatic developments is everyone understands environmental problems are much more serious than we thought even 10 years ago.

We have the Paris Agreement, which is in my mind a turning point in human history. Basically all the countries in the world have agreed climate change is so significant they are willing to take serious measures. That's enormously important. We have also understood biodiversity loss is happening much more rapidly than we knew 10 years ago. Astoundingly, something like 50 per cent of all wild animals have been eliminated in the last 40 years.

In me there is enormous hope, because once you understand things you can start to solve problems. For example, there is a lot more citizen involvement in enforcement.

We started air quality cases in the UK, and we beat the government in the Supreme Court. I had discussions with Michael Gove yesterday about air quality, I hope the UK will now make dramatic moves to clean it up.

We have also brought cases all across Europe. We have won a series of cases in Germany for example and Poland, and we will see results. We will see countries having to now deliver on the promises they made, because citizens are demanding it.

China has also changed a lot in the last 10 years. Napoleon said: "China is a giant who is sleeping, and let her sleep because when she wakes she will change the world." And he was a smart fellow - it has woken up on the environment.



James Thornton is the founder and chief executive of ClientEarth. The award-winning environmental law firm was established in 2007 and uses advocacy, litigation and research to address environmental challenges, including biodiversity loss, climate change, and chemical pollution.

Thornton is also a successful novelist and a conservation fellow of the Zoological Society of London, and in 2012 he was named by The New Statesman as one of ten people who could change the world.

In 2016 he was also named BusinessGreen's Leader of the Year.

China has articulated its new vision for an ecological civilisation. And it means it very seriously. That's very exciting, because it's far more of a profound examination of this than is happening in any Western country. If they are successful then they will lead the world in green technology.

So while the Western companies who are clever about this will be ahead of companies pushing old industries, the real competition I think for Western green companies may be coming from China. They will have to keep a careful eye on that.

A few people can make an enormous difference. We have had very profound impacts in Europe, in China and in Africa, and we are still only a little more than 100 people at Client Earth. And that's by being strategic, having powerful tools, and having a vision of where we want to go.

What is the most important lesson you have learned over the last decade?

That a few people can make an enormous difference. We have had very profound impacts in Europe, in China and in Africa, and we are still only a little more than 100 people at Client Earth. And that's by being strategic, having powerful tools, and having a vision of where we want to go.

What's your vision for the green economy in 2027?

The world's biggest problems from an environmental perspective are climate change and biodiversity loss.

My hopes for the next 10 years are that we will see a thorough move towards addressing climate change. I believe there is still time to do it. If industry and the market really get behind moving faster towards electrification of the transport fleet, electrification of the economy, and generating the electricity needed in a zero-carbon way, then we have tremendous potential to keep climate change within the Paris Agreement target. Even 1.5C is possible.

And second is biodiversity loss. The good news is even though we have killed 90 per cent of the sharks in the ocean, 10 per cent are still there. So all we have to do is treat them with respect and the biodiversity loss can be stabilised and we can come back.

What will be the biggest changes on the ground?

Well one that's obvious to visualise is people will drive fully electric vehicles and the electricity for that will come from only renewable sources. If that happened, your contribution to climate change will plummet and the health of your children will soar. That's one change I think is very tangible and reasonable to expect.

Do you think we will be on course for two degrees?

Yes, well we have to be. And I believe we certainly can be. The reason I am generating hope for it is because hope is my job. Unless you have a positive vision of where you want to go you will never get there.

If you could invest in one technology over the next decade which would it be and why?

That's an interesting question. I would say there would be two: clean tech in terms of electricity generation, and Artificial Intelligence (AI).

I think one of the ways the industry is going to help us move much more quickly than we anticipate to a carbon-neutral economy is through development of AI. That needs to be done in the right way, in such a way that it benefits people and the environment. But it could potentially be an enormous help in making sure we achieve these objectives.

If you had to give some advice to somebody starting out in the industry today what would you say?

I would say the future is carbon neutral. So find a way to contribute something that nobody else is, and contribute something that AI won't be able to do instead of you in 10 years.

LORD ADAIR TURNER

Where were you in 2007?

I probably hadn't thought about the issue of climate change before 1995 or so - I was vaguely aware of the science but I hadn't really paid a lot of attention to the early development of the Kyoto Protocol and so on.

But when I became responsible for presenting the point of view of business I had to take it seriously. As head of the CBI I had to decide what our lobbying stance would be. So because I had to take it seriously I read and thought about it, and I became absolutely convinced the science was clear, that this was a very dangerous threat, and that there was almost certainly a set of technologies - if we unleashed the power of human innovation, private capital and public support - that could deal with it economically.

In 2007 itself, I have to say I wasn't heavily and directly involved in a specific climate role at that stage, but I was about to be. I was appointed to the Climate Change Committee (CCC) in early 2008, and we produced our first report at the end of 2008.

Over the last decade how would you characterise the shift you have seen happening in the green economy?

The most fundamental thing that has changed is that progress on renewable electricity has gone far faster than most of us anticipated back in 2007.

If you look at the first work that we did in the CCC in 2008, if you had asked me then what we have to do to decarbonise UK electricity I would have said to back three different technologies: renewables, carbon capture and storage (CCS), and nuclear.

Since then the cost of nuclear has not gone down, the cost of CCS has not come down, and the cost of wind and solar has come down something like 70 and 90 per cent.

So that then raises the real potential that we could actually decarbonise electricity supply with a close to 100 per cent renewable system. The realisation that is possible is one of the most transformational things that has occurred.

What is the most important lesson you have learned over the last decade?

It is that a form of government policy aligned with the free market can work. The fact is, we would never have had dramatic falls in the cost of wind, solar, and batteries without initial subsidies. We made a set of commitments that we wanted green renewable energy - that required subsidies up front to get it going, subsidies which at the time were criticised. Those subsidies, along with public-sponsored R&D support, have driven the private sector to achieve scale and learning such that the prices have come down so much we soon will not need subsidies.

That was the theory of the case that people put forward in advance, but I have to say I think it has succeeded beyond people's wildest dreams.



Lord Adair Turner is the chair of the Energy Transitions Commission, which aims to map out pathways for the world to shift to low-carbon energy while still enabling economic development.

He is a former director-general of the CBI and former head of the Financial Services Authority before its abolition in 2013. He was also the first chairman of the Committee on Climate Change.

What will be the biggest changes from today's world by 2027?

The single most important answer around the world is that we drive that decarbonisation.

But one also has to realise that's not a sufficient answer in itself. Because there are some sectors where even if you had limitless green electricity it wouldn't solve the problem. For example, cement production. It produces CO₂ as a by-product of the chemical process.

So we are going to need other solutions for what the Energy Transitions Commission (ETC) calls the "hard to abate" sectors.

For example, what are we going to do about aeroplanes? We may be able to use electricity on some short haul flights but I doubt if we are going to be able to fully electrify long haul flights. What are we going to do about cement production? Steel production?

Which sustainability challenges will be top of the agenda in 2027?

By 2027 we will be increasingly confident that we can build low-carbon electricity systems. We will still have a major challenge however in the fact there is still a whole load of coal-fired power in the world. Because it's there already it will mean it's competitive on a marginal cost basis. We will either have the enormous cost penalty of persuading people to close that down before its end of life, or we will have to have CCS.

I think challenge number two will be water. In many parts of the world there are very severe water stress problems which will be made worse by climate change.

Will the world be on course for two degrees in 2027?

I think it is touch-and-go whether we can meet 2C. And although I admire the fact Paris targets 1.5C, as I look at the science that is almost impossible.

We will have a greater confidence we know how to build an eventual zero-carbon economy by the late 21st century, which is fully compatible with rising prosperity in the emerging world. But we will be worried about whether we can get there fast enough to prevent the accumulation of CO₂ in the atmosphere getting so high that we go above 2C.

If you could invest in one clean technology through to 2027 which would it be and why?

Even better batteries. What we are seeing so far is remarkable progress with lithium ion batteries, where Tesla and others are operating at such scale they are getting learning effects and economies of scale, and we're seeing dramatic reductions in the cost of a fundamentally unchanged technology. I think that's great and it will take us quite far. I think by 2020 we will have battery systems using lithium ion at below \$150 per kWh.

Technologically, I'm significantly more optimistic about the future. The pace at which the costs of renewable power and batteries have come down make me much more optimistic that this is technologically achievable.

But if by 2027 we could get that down to \$50 per kWh, and if we could get the density improved to get a kWh per kg of battery, rather than 0.4 kWh per kg of battery, that would be transformational.

Are you optimistic or pessimistic about the future?

Technologically, I'm significantly more optimistic about the future. The pace at which the costs of renewable power and batteries have come down make me much more optimistic that this is technologically achievable.

But the developments in the US with President Trump made me more worried that politics and self-interested lobbying will get in the way of the logical way forward.

What advice would you give to a sustainability professional starting their job today?

Understand the huge potential power of human technological innovation, and understand that will not be delivered either by governments acting alone or the private sector acting alone, but by an effective mix of both of those levers.

So keep well away from any demonisation of the private sector, and keep well away from any demonisation of the state. They are both needed, but they are needed in a symbiotic combination.

DR JEREMY LEGGETT

Where were you in 2007?

I had just stepped down as Solarcentury's CEO, with great relief, handing over to the wonderful Derry Newman, MD of Sony UK until his defection to what was then a glorified South London roofing company.

There was just a chance, I figured, that such a man would be able to grow and run the company better than me. And that it would give me time and space to do the things that really interested me. I had books to write. And we had set up SolarAid, with five per cent of our profits, in 2006.

Where do you expect to be in 2027?

I plan to keep chronicling the great global energy transition, in prose and storytelling that ordinary folk can appreciate, meanwhile doing my best to peer into the crystal ball.

Broad as the energy arena is now, I plan to survey an even wider stage because artificial intelligence and robotics are accelerating fast alongside clean energy technologies. This grand nexus of change offers huge opportunities, but also poses severe new threats. AI and robotics can also be used for sinister purposes, providing the perfect apparatus for police states, and the authoritarian right is on the rise in politics. I will be 73 in 2027, if I make it. I would like to be seen as a wise old chronicler, aspiring futurist, and teller of truth to power.

What is the most important lesson you have learnt over the past 10 years?

Never trust the Tories.

What is your vision for the green economy in 10 years' time and what do we need to get us there?

One needs to be a holistic expert to have a view of an entire economy. I have come to the view that there are no such experts left. Things are moving too fast, and the germane disciplines and technologies are too diverse. Suffice to say, things can move a lot faster than most people seem to believe possible, in both good and bad directions.

Will the world be on course for two degrees in 2027?

We certainly have the technologies and strategies to be shovel ready, never mind in the lab and the minds of young innovators.

If you could invest in one clean technology through to 2027 which would it be and why?

Digitalisation and the multi-technology platform business models that are opening up around us suggest to me that the kinds of investment a decade from now are likely to be very different from the kinds of bets we can make today. I am sorry to dodge the question. But 10 years really is a very long time when there is so much potential for exponential growth curves.

What advice would you give to a sustainability professional starting their job today?

Learn to code, work in a hub surrounded by startups, and keep the faith with green core values.

Are you optimistic or pessimistic about the future?

I am a qualified optimist, with a small q and a lot of emphasis on that word.



Dr Jeremy Leggett is the founder and director of solar firm Solarcentury. He also is the founder and chair of SolarAid, a charity that provides solar-powered lights to some of the world's poorest communities.

He is the author of four books on the climate-energy nexus, including Winning the Carbon War, which charted the rise of global climate action ahead of the Paris summit.

JULIET DAVENPORT

Where were you in 2007?

In 2007, we had just taken over our back office company and integrated it into Good Energy, and relocated our whole team to the offices we have today.

The company was still pretty much in its infancy, with its focus on delivering 100 per cent renewable electricity to small businesses and household customers. We had one wind farm and had started working with micro generators to encourage a community of smaller renewable generators.

The HomeGen scheme we had developed then became the blueprint for the government's Feed-in Tariff Scheme, which now sees over 900,000 households generating their own power today.

"I think Good Energy will be a really different company in 2027. Perhaps not so much delivering electricity and gas, but instead delivering services for customers to generate, balance and use energy in their homes and businesses."

Where do you expect to be in 2027?

I think Good Energy will be a really different company in 2027. Perhaps not so much delivering electricity and gas, but instead delivering services for customers to generate, balance and use energy in their homes and businesses.

Products like our peer-to-peer trading platform Selectricity will be integral to helping our customers minimise their costs and ensure their energy use has little to no impact on the environment.

What is the most important lesson you have learned over the past 10 years?

Trust in your customers. Our very first share offering was prompted by listening to customers in our call centre, hearing that they wanted to be part of the business. Since then I have always valued our customers' views - not only are they the best barometer of our performance, they give us an informal steer on the direction our business needs to take too.

What is your vision for the green economy in 10 years' time and what do we need to get us there?

Looking at how far renewables have come in the last 10 years, my expectations are high! In 2007, less than 6GW of renewable capacity was deployed in the UK. This has increased by over 600 per cent to a massive 38GW in 2017. I don't expect we will quite get to 100 per cent renewables in 10 years; although - looking at the developments of solar, onshore and offshore wind and tidal - we are in with a chance.

Clean tech - like batteries, electric vehicles and smart technology - is so important in supporting this change. Ongoing cost reductions as these technologies mature will allow for more and more renewables onto the system.

The final part of the puzzle is consumers. Keeping them engaged and connected with how their electricity is generated, stored, and used is the key to bringing us the real transformations.



Juliet Davenport is the founder and chief executive of Good Energy, one of the UK's leading green energy suppliers.

The company was responsible for the first commercial onshore wind farm in the UK, at Delabole in Cornwall, and it was also the first company to launch a renewable energy marketplace in the UK, in collaboration with Open Utility.

In 2013 she was awarded an OBE for services to renewables and in June 2015 she was appointed to the board of the Natural Environment Research Council.

What will be the biggest changes from today's world?

The biggest change will be bottom-up energy, rather than top-down. The journey from the grid to the end customer will look very different, with loads of different business models facilitated by digital systems that use AI or Blockchain to manage energy trading. The players will look completely different and it will be digital and data that rule the show.

***“Decarbonising heat is a massive opportunity and a challenge because of the inefficiency of the existing housing stock in the UK. New technology and systems will be key.*”**

What three sustainability challenges will be top of the agenda in 2027?

Firstly, decarbonising heat is a massive opportunity and a challenge because of the inefficiency of the existing housing stock in the UK. New technology and systems will be key to supporting people to use less energy in heating their homes.

Secondly, early solar panels and batteries will be reaching the end of their lives by 2027 and recycling will be a top priority to reduce mineral and electronic waste. A whole new industry will be built around reusing and recycling these.

Third, aviation and shipping are the slow movers on reducing greenhouse gas and pollution emissions. However, innovative technologies are coming through in these areas, which could see battery-powered planes become a reality.

Will the world be on course for two degrees?

I have a feeling we will overshoot 2C. The question is whether we will be able to bring it back and find ways of cooling our planet.

If you could invest in one clean technology through to 2027 which would it be and why?

That's a tricky one because the UK needs a mixture of renewables and flexible clean technologies to keep us on track to meet our emissions reduction targets.

If just one, I would say tidal lagoon power because the UK should make the most of its fantastic tidal range. This could be a world leading industry that sees us gaining from a highly dependable and dispatchable source of renewable power.

What advice would you give to a sustainability professional starting their job today?

I've seen the renewables profession develop from its humblest beginnings, and seen the technological innovations and policy interventions that have come along the way. So I would say keep an open mind and your skill set broad; learn how to communicate and keep an eye on the technology. There will be unique opportunities out there in the future, so the ability to adapt is essential.

Are you optimistic or pessimistic about the future?

Optimistic. Always optimistic and smiling.

LORD STUART ROSE

What did the sustainability landscape look like in 2007?

I think the wheels had slightly come off people's passion for climate change and for sustainability because of course we were on the brink of the great economic crisis. So there was a real push a couple of years before that but people really were beginning to worry more about the economy. And I was feeling at the time that greenness, sustainability, was falling off the agenda because people were worrying about their businesses.

I wish people would understand that 2050 is only 33 years away. And it will go in a nanosecond.

How has that changed over the last 10 years?

We are in a better place now than we were 20 years ago, and we are in a better place now than we were 15 years ago, but I have to say that in the last few years I think there has been more flatlining than I would have liked. It's come off the top of government agendas. There hasn't been the same passion and unification as I would have expected, and of course the United States hasn't played as big a part or as passionate a leadership role as one would have liked. In the UK, I have to say, with the last government and with the present government, it's certainly not top of their agenda.

In terms of the business moves, what have you seen in the last decade that gives perhaps more cause for optimism?

I'm optimistic, and there are some very good examples of businesses that have really continued to drive forward. So lots of small businesses have picked up the baton, lots of medium businesses. And the Unilevers of this world, the Walmarts of this world, even the Marks & Spencers of this world, have reset their targets for 2020 and 2025. So there are some good things going on in the sustainability arena, but it doesn't have the same cut through, in my view, that it could have had if we had a government that was really pushing the agenda.

What's the most important lesson you have learnt in this area over the last decade?

I wish I had started my own journey earlier. I wish people would understand that 2050 is only 33 years away. And it will go in a nanosecond. Actions we don't take today will have a dire effect if the predictions are true. So we have to really act early, act soon, act in a unified way and get on with it.

Is that the advice that you would give someone starting out in sustainability today?

I would tell them the most important enemy you have got is time. We have to move on fast, and if you don't move on fast now you will regret because time will go very quickly. So speed is of the essence.



Lord Stuart Rose spent four years as the chief executive of Marks & Spencer before assuming the role of executive chair at the retailer in 2008 for a further two years.

During his time at M&S Lord Rose oversaw the introduction of the flagship Plan A sustainability programme, widely regarded as an industry-leading environmental agenda. He was also the chairman of the Stronger In campaign for the 2016 referendum on leaving the EU.

He was knighted in 2008, and was made a life peer in 2014. In 2014 he was also named BusinessGreen's Lifetime Achievement Award Winner.

What would you like the world to look like in 10 years' time?

I would like to see more co-operation. No country, no business, no individual, is big enough to be able to tackle some of the problems this planet will be facing in 20, 30, 40 or 50 years' time. We need more co-operation across governments, companies and NGOs, and we need more of a coherent and cohesive government vision for what the issues are and how we are going to deal with them. I really do believe that one plus one plus one equals more than three.

What will be the key challenges over the next decade?

Well, the biggest three things that we are going to face - and everybody knows this - is the global population, which is increasing exponentially. This means we are likely to have a shortage of energy, food and water. Not across the whole world, but in certain areas there will be big crises. So that's the problem for the next 50 years - how do we feed this ever expanding population on the planet? And how do we do that in such a way that we also protect what's left of our eco structure? So that's a very complicated problem which no individual can solve, no government can solve, and no company can solve, but collectively we can do it together.

How does that change life for people in the street?

Well, we have to educate people. The really dangerous place to be would be if everybody does nothing, then eventually governments will wake up to the fact that there is a crisis and they will be forced to legislate. And legislation is a very crude weapon, it's a very crude instrument. And what you need to do is to head that off at the pass to avoid that.

Start taking actions now, however small on an individual level, or however large on a corporate or government level, which will make sure that we don't have to go to the fall-back option of governments having to take action because we are facing a crisis.

Do you think we will be on course for a 2C target?

I don't know. Some recent research suggests there appears to be less warming than we originally thought. That's irrelevant. It's still going to be the fact that we're going to have a whole crisis on our hands about water or energy, and on top of that if we have got a planet that is warming that's only going to make all those problems more challenging. So 1C would be bad enough, even 1.5. I don't think we need to stick with 2C as a benchmark.

The planet is getting hotter. We are polluting it, we are creating the conditions which will put - without over emphasising it - the potential survival of this species on this planet under threat.

If you could invest in one technology for the next decade, which would it be and why?

The one I think is the most exciting is the electric car.

Would I buy an electric car? Absolutely. We have to get everybody to think this way.

The technology is here. Now it is not about the technology, it's about the mindset. Would I buy an electric car? Absolutely. We have to get everybody to think that way. Literally last week I've starting looking at whether I should change my car for one. Even I, an old Luddite like myself, has woken up to the fact that I need to do something about it.

SIR IAN CHESHIRE

Where were you in 2007?

I was running B&Q - it was the year before I took over as chief executive of Kingfisher.

We were getting into some of the circular economy work for the first time. There was a sense that summer that the storm clouds of the financial crisis were starting to gather, a feeling things were getting quite uncertain but we needed to move faster on the green agenda.

I was encouraged that a lot of our supply chain was working with us to make a difference, so it felt like an odd contrast between an increasingly uncertain and dangerous world, and lots of opportunities we were seeing to re-engineer products and rethink business models.

So what has changed in the last decade, and what have you learned?

I think what has changed most has been the degree of shift in technology in that period.

If you think 2007 was the year the first iPhone was released it doesn't seem quite possible. On the back of that the mobile internet has completely transformed the world, and in relation to that (but not directly connected) we have seen an explosion in renewables, new materials and batteries.

I think it's the rate of change since 2007 which I have most noticed. It's the hyper-transparency that we have now got, and that you can scale things in a way that wasn't possible 10 years ago. Change seems to happen at a network rate. So you get these huge shifts - Facebook suddenly connecting billions rather than just a few people.

There's a sense that if you catch the tide on these things change is possible at a faster rate than ever before. Which is good and scary at the same time.

What is your vision for the green economy in 10 years' time?

I hope we will have done two big things. One of which is making a more substantial shift towards a circular economy model.

The second part is I think there are real opportunities to rethink how sustainable business can play a role. I think that's reinforced by this technological change of total transparency, and using that to build a different relationship with customers and citizens. I think that's a very different model we could be looking forward to.

What would that look like for the average consumer?

There's probably not one single mega-change. We are not all going to be running around in flying cars, which is a shame because the Jetsons were rather fun.

I think what you will see emerge is a digitally enabled consumer who is able to understand far more about the impacts of how they behave and what they do, and be able to use that consumer power to help businesses change more.

Fundamentally, the big shift from the consumer's point of view will be an increasing focus on the sharing or gig economy. We are already seeing it with car ownership in certain groups. I think you are going to see a much more digitally enabled, switched on, use-it-when-you-need-it, experience-driven consumer, rather than one who has just got loads of gear.



Sir Ian Cheshire is chair of the department store Debenhams and chair of Barclays UK, the retail arm of Barclays bank.

He was previously chief executive of B&Q and then its parent company Kingfisher.

He was knighted in the 2014 New Years' Honours list for services to business, sustainability and the environment, and in 2015 received BusinessGreen's Lifetime Achievement Award.

What top three sustainability challenges will top the agenda in 2027?

Personally, I still think we won't meet the challenge of climate change in the next 10 years. That will still be with us, which is an all-encompassing headline for quite a few other things.

Number two is this model of the economy – can we really see a reinvention of the economy from that linear 'take, make, dispose' model to a more circular system?

“You get these huge shifts - Facebook suddenly connecting billions rather than just a few people. There's a sense that if you catch the tide on these things change is possible at a faster rate than ever before.”

And then I think you are going to see individual issues arise. It's interesting society seems to focus on things for five or 10 years, then declare victory and move on to the next thing. So if you think back to the ozone layer, everyone got focused, CFCs got banned and people actually did something about it. I think we are just at the beginning of a 10-year cycle on oceans – not just plastics in our oceans but generally the health of our oceans and the degree to which that has not been understood.

What's your personal plan for the next 10 years?

One area which interests me is the whole connection between food, farming and the countryside - I'm going to get involved in a project starting later this year on that. It's a side effect of Brexit that the UK could have a rethink of how its economy and farming interact, because it will be outside the Common Agricultural Policy for the first time, which is interesting.

Then the other question, which I still think is not on the agenda enough, is the sustainability of cities. So much of the world's population is moving to cities and they can be great engines of sustainability if we build them and run them right.

Will the world be on course for two degrees in 2027?

I'm a little pessimistic. I think what we are seeing is the first really big shift in power generation that we have seen certainly in my lifetime. But I think it will require a lot more in the way of things like electric car growth to make it really happen.

But I think what's most important – and this is not being unfair on us in the UK – is the shift in the Chinese leadership, the realisation they simply can't have unsustainable growth, which makes me more optimistic about the future.

If you could invest in one clean technology through to 2027 which would it be and why?

I'm very interested in the whole area of materials sciences and the ability to make things which could, for example, replace aluminium, things which allow batteries to work on a completely different basis. I think you are going to see some very fundamental changes courtesy of materials science.

What advice would you give to a sustainability professional starting out today?

If you are starting out the two bits of advice I always give to people in an organisation is figure out the unique contribution that organisation can make. Don't try and do everything. If you are in the car industry, reinvent that one, don't fret about the other ones.

The second one is think about how to unleash the power of the consumer and the transparent world that we have, and all the data that is out there to make change.

Are you optimistic or pessimistic about the future?

I'm optimistic, because I think we have got to the point where enough people are worried and we have seen some of the big players like China come to an understanding that things can't carry on in a straight line.

The main reason why I am optimistic though is because I am a profound believer in human creativity, and I think we will find solutions even if they are not easy or straightforward.

MARK CAMPANALE

Where were you in 2007?

I was at Henderson Global Investors. I'd been one of the founding team in 1994 that had built their Global Care brand of thematic sustainability funds from £10m to over £2bn.

From around 2001 Nick Robins and I, the other founder of Carbon Tracker, had started to lecture on our 'stranded assets' and 'unburnable carbon' thesis and published the first carbon footprint of an investment fund.

Where do you expect to be in 2027?

By 2027, I'd expect to be continuing to implement some of the ideas in the investment world that I've been developing since the '90s, the first being around more effective capital markets for high social impact enterprises. I founded and incorporated the 'Social Stock Exchange' in June 2007 which is still building out today. And the second would be looking at ecosystems limits to how capital markets operate.

So in 2027 I'd hope that capital markets function better to support particularly social enterprises in lesser-developed countries; and that capital markets respect ecological limits through better transparency and accountability.

It's OK to get angrier as you get older. A peaceful and untroubled mind is an unproductive mind, maybe a complacent mind.

That is what Carbon Tracker, and more recently Fish Tracker, is really about.

What is the most important lesson you have learned over the past 10 years?

A lot needs to be swept away; let's start with attitudes, institutions, people, positions, market behaviours. New wine often needs new wine skins (I'm stealing a saying from the past).

'Mainstreaming sustainability' in financial markets is a delusional journey whose mission is led by the inexperienced and the naive. I hear it all the time but I've never understood what it meant.

Don't wait to be led, always take the lead and listen to people younger than you more often than you do; and don't listen to people in positions of power or influence. They're often the first that need sweeping away as they're protecting the status quo (sometimes including their own position).

And here is a lesson to remember: it's okay to get angrier as you get older. A peaceful and untroubled mind is an unproductive mind, maybe a complacent mind.

Remember in sustainable financial markets, the biggest and most effective changes have occurred when women have been in leadership. So don't surround yourself with guys. If you do, things often end unhappily.

Lastly, resist people who say 'let me be your boss; I know what you want, better than you do, let me run this for you'. If they're not a fox, then they're almost certainly a snake. Real partnerships start with standing in the same place and looking forwards in the same direction.



Mark Campanale is founder of the Carbon Tracker Initiative and one of the chief architects of the 'unburnable carbon' capital markets thesis, which argues we cannot burn all the proven fossil fuel reserves in the world and avert dangerous global warming.

At Carbon Tracker he is responsible for management strategy, board matters and developing the organisation's capital markets framework analysis. It's goal is to align capital markets with natural ecological limits to growth.

More recently, Mark Campanale founded and is chair of the Fish Tracker Initiative, which focuses on limits to growth in the fisheries space.

What is your vision for the green economy in 10 years' time and what do we need to get us there?

We need to find ways of incorporating ecological boundaries into international accounting standards; into the listing rules of companies on stock exchanges, or how companies report through better integrated reporting.

We need fundamental reform of the whole financial architecture of capital markets.

So no listing of logging companies or oil palm companies, or fisheries businesses without independent sustainable resource management plans or assessments of ecological limits; no more financing through debt or equity capital markets of fossil fuel companies whose plans take the world above 2C of warming.

And we'll need to make sure that the WTO rules sit beneath the Earth Summit treaty obligations, not the other way around. To get us there, we need fundamental reform of the whole financial architecture of capital markets.

What will be the biggest changes from today's world?

In the future, investors will have learnt that ecological limits can be translated into financial risks and these risks pop up in nearly every sector.

Transformation is happening in the energy and transportation sectors - we need the same changes to happen in agricultural production, in water and fisheries management.

The SDGs will have become mighty pillars through which investors can better understand the world of risk and opportunity.

What three sustainability challenges will be top of the agenda in 2027?

Maintaining a stable climate will be critical, followed by establishing sustainable food production systems. I want to put water in front of the other two sometimes, I know that is going to be crucial.

Will the world be on course for two degrees?

I hope so, but fear we won't be able to bend the emissions curve downwards fast enough. Technology is a fix but it can't save us in time - we may need new agreements to limit the supply of fossil fuels to ensure we keep below 2C.

If you could invest in one clean technology through to 2027 which would it be and why?

Battery storage technologies, so that we can allow for better grid management and to get power when it is needed but from renewable sources.

Are you optimistic or pessimistic about the future?

I'm broadly optimistic. Although time is really against us.

ANNA GUYER

Where were you in 2007?

I founded Greenhouse in 2007, with a mission to work with pioneers and entrepreneurs to create positive social and environmental change.

This was a personal response to a powerful film made by the Christian NGO Tearfund, which told the story of families across Africa who could no longer live or farm on their land due to the huge impact of climate change. The film brought home the consequences of climate change and the disproportionate impact it has on the world's poorest people. Even then it had already created thousands of environmental refugees.

It was a life-changing moment and I decided that, however daunting the task, the focus of my work needed to be addressing climate change and helping to create a more sustainable future.

In the ten years since then, Greenhouse has worked with energy pioneers using renewables and battery storage to create a smart, cost-effective, low-carbon power system; transport pioneers launching electric and hydrogen cars and low-carbon alternatives to diesel for HGVs; food pioneers promoting organic food and sustainable agriculture; and financial pioneers educating capital markets and investors about climate risk.

We have used our communications expertise to help organisations have more impact, raising awareness of the solutions they offer and why they are needed. We have enabled them to reach policymakers and investors, customers and consumers, encouraging people to wake up to the potential of the new green economy.

Where do you expect to be in 2027?

By 2027, I hope to be living in a world that has embraced not just the urgent need for a green economy but also its huge potential.

Today's disruptive innovations and the fast-developing sharing economy are transforming the way we live and work, and with the current pace of change, so much is possible.

But we will still be living in an unsustainable world. Ten years from now other challenges such as water shortages, air quality and biodiversity will all be much higher up the agenda.

Greenhouse will still be working with the pioneers - businesses, entrepreneurs and campaigners who find opportunities in developing extraordinary solutions to these problems, whether that is using emerging technology to develop better services, developing a revolutionary new product or finding new and powerful ways to analyse problems.

There will still be just as much need to frame clear powerful messages about why their solutions matter to people, business and the economy, and to offer a compelling vision of a sustainable future.

Even small organisations can have a global impact when a powerful proposition is communicated well – just look at the influence of Carbon Tracker as it has brought the concept of the carbon bubble and stranded assets to policy makers, influencers and investors on a global scale.

We need organisations to be brave, to be focused, and to communicate effectively if we want to scale the change we need to see.



Anna Guyer is the founder and director of Greenhouse PR, a communications agency entirely focused on accelerating the transition to a sustainable and green economy. Previously, Anna was a Board Director at Hill & Knowlton and Trustee of Transition Towns.

Greenhouse PR won BusinessGreen's award for Green PR Agency in both 2015 and 2016.

What is the most important lesson you have learned over the past 10 years?

Do what you can where you can. Don't procrastinate – get on and do it.

Surround yourself with others who share your values, who want to support you in your mission.

The new green economy is a sharing, collaborative economy, full of intelligent, passionate and fascinating people. So always learn from those around you and collaborate and support others wherever you can.

What is your vision for the green economy in 10 years' time and what do we need to get us there?

I want us to create a thriving, smart, green economy that will be regenerative and restorative for both people and for the planet.

We need governments and businesses to understand and recognise the value and importance of ecosystem services, and become more accountable for their decisions and our footprint in the world.

We need financial markets to invest in the solutions that exist, shifting billions away from funding unsustainable activities. There is growing awareness of 'climate risk' but not enough recognition of 'climate opportunity'.

And ordinary people need to recognise that their money can have real impact. We can all help shape the future by choosing where we save and where our pension is invested. There are many funds that support renewables, protect resources such as water and forests, address social inequality, and still get a good financial return.

If we all invested just 10% of our savings and pensions in ethical and sustainable funds, then individuals and institutions could be investing billions in the change we need to see.

Will the world be on course for two degrees in 2027?

I think we have the knowledge and technological capability to get there. The growth of renewables is now unstoppable and that, combined with battery storage and electrification of transport, creates huge opportunities for transformation.

But governments and policy frameworks have a huge part to play. They also have the frustrating potential to slow everything down.

If you could invest in one clean technology through to 2027 which would it be and why?

Solar power and battery storage - these are disruptive technologies which are growing exponentially as costs continue to fall. They are fundamental to decarbonising our economy and they offer real benefits to individuals and communities.

Solar panels on household roofs linked to home batteries and electric car batteries have huge potential when they are managed in a virtual power plant. Communities will soon be sharing the power they generate so that everyone saves money, and earning further income by providing services to support the grid.

We help people to see the potential and to realise that we all have significant role to play in building a better, more rewarding and more sustainable world.

At a network level, domestic and utility-scale storage will allow clean solar and wind power to provide an increasing proportion of our electricity. By managing these in a smart grid we can reduce the need for fossil fuel power stations and cut the costs of running the system.

We are well on the way to decarbonising power, but our electricity system will also need to support rapid growth of electric vehicles over the next decade and beyond. This will create even more demand for solar and storage.

But I also have to champion the protection of scarce resources - and in particular water and timber. It is possible for us all to invest in the things that we care about. Water is going to be such a critical issue that investing in its protection is critical.

What advice would you give to a sustainability professional starting their job today?

Recognise the power of good communications. Business pioneers, technology entrepreneurs, and social enterprises are doing amazing things, but they need help to take those ideas to scale.

We need more communicators to share stories with networks of influencers and decision makers, mobilise support and accelerate the transition.

Are you optimistic or pessimistic about the future?

I feel lucky to be a natural optimist, and I surround myself with people who help me to sustain that. I am fortunate to work with entrepreneurs and pioneers – people pushing the boundaries of what's possible – who by their very nature, see a problem as a reason or a catalyst to find a solution.

Hope is a powerful motivator. It's too easy to feel powerless when confronted with the challenges we face - that's why we need to give people a positive and encouraging vision of what the future can look like.

We help people to see the potential and to realise that we all have significant role to play in building a better, more rewarding and more sustainable world.

ANDREW HOWARD

Where were you in 2007?

I was just starting out doing sustainable investment back when it was beginning to become a 'thing'.

At the time I was at Goldman Sachs starting a product called GS SUSTAIN. It was a time where I would say sustainable investment was beginning to emerge as something which big investors and research firms were trying to work out how to do – so it was on the radar, but was still at a very early stage in terms of figuring out how to approach the question.

How have things transformed over the past decade?

The industry has changed a lot, but – although I hate this phrase – I think we're on a journey. We've come from this situation where 10 years ago we were beginning to see an ESG industry as opposed to an SRI industry. What I mean by that is an industry which has historically been a niche part of our investment world was moving towards a recognition that this question of social and environmental change wasn't simply about ethics and responsibility, it was about understanding businesses better and it's something which is relevant to all that we did, not just discreet funds.

There is more recognition now that companies are not a set of numbers pulled out of an annual report, they are part of society. Successful companies succeed because they adapt to the social and environmental pressure they are part of, rather than by trying to shape the outcomes. They don't succeed by running against the grain of social and environmental trends.

What has been the biggest obstacle to green finance over the past decade?

There was much less data around then compared to today. When I first started 20 years ago a lot of my colleagues didn't even use Excel and email was beginning to become something we thought about, but pretty much half the people over about 45 couldn't get their heads around it.

Today we are awash with data, and one of the challenges that creates is it tends to focus people onto a more systematic way of doing investment analysis. What Schroders generally - and personally as well - recognises is that it is very difficult to see where climate change fits into this.

Can we definitively say climate change will have a direct or indirect impact on a company's earnings over the next 12-18 months, and if so, do we know definitively how big that impact will be in a way we can objectively model? The reality is that no, we don't.

So while on the one hand I think people understand climate change is going to be an enormously important social, economic, and investment issue over the next five, 10, 20 years, it is much harder for people to know how to incorporate that understanding into day-to-day building of a model and making an investment conclusion.



Andrew Howard is head of sustainable research for ESG at Schroders.

Having started out as a metals and mining company analyst, Andrew spent a year at Global Witness where he led the green NGO's global finance campaign from 2004-2005.

He then worked as a management consultant at McKinsey and Co, before being appointed by Goldman Sachs as head of the research team which helped launch GS SUSTAIN in 2007 – a strategy which sought to incorporate ESG factors into the company's long-term investment plans.

In 2014 he founded his own independent research firm – Didas Research – before joining Schroders in early 2016.

How have public and corporate attitudes changed towards climate change since 2007?

I think attitudes have changed massively. At a high level, this used to be something that was a bit optional and unusual, and today it is pretty much second nature. Not in every country and age group, but it is becoming that.

We are on the brink of an exciting time ahead in terms of our industry and the green economy.

Ten years ago there were still questions about whether climate change was definitely happening. If you look at now, that debate has largely passed – one or two very notable people aside.

Find me the CEO of a large multinational company who says anything other than ‘climate change is a major challenge facing our society and the world economy, it is something that must be addressed, and we are committed to addressing it’. It may only be words, but it is very difficult to say anything other than that today.

So I think there has been a real sea-change in how people think about the question. It has shifted from niche to mainstream, from something that some people think about, to something people almost don't think about, because it has become second nature.

What have been your biggest personal and professional achievements of the past decade?

Well, I think my wife would kill me if I didn't say getting married and having children.

Having children has changed how I look at climate change a lot. There is this anti-decarbonisation tendency among people who won't necessarily personally feel the ramifications of what is fairly clearly unfolding, but however you want to look at it, there is a very clear understanding that this is a risk we don't need to take. Maybe thousands of scientists have got this wrong, but it is not a risk worth taking. It is particularly clear when you have children and you think forward.

Professionally, I personally don't feel there is anything much in our industry - and myself included - that shows a particular single thing we can stick our nail on and say we've done. We have more questions to answer than we have already answered as an industry. Personally and professionally, what I am here trying to do, and what Schroders is trying to do, is to answer those questions that remain unanswered.

What are the biggest risks to the success of the low-carbon transition going forward?

I think there was a real danger around the time of COP21 in Paris which introduced a degree of complacency that somehow it had solved something. Paris was a lot of people agreeing something on paper which didn't actually change anything very much, and certainly I was becoming slightly concerned there was quite a lot of complacency that somehow because the headlines looked good at the time, people said they had solved that problem and could therefore move onto something else.

Trump, ironically, with his statement around withdrawing from Paris may have been the catalyst that galvanised action back into ‘well hang on, we probably ought to do something’.

Are you hopeful for the future?

The short answer is always. Absolutely. We are on the brink of an exciting time ahead in terms of our industry and the green economy. I just hope we can find solutions to those questions because we are thoughtful and far-thinking enough to find them in advance, rather than picking up the pieces.

CAROLINE HILL

Where were you in 2007?

Back in 2007 I was working at PwC in their sustainability and climate change team. I think PwC was really at the vanguard of sustainability consultancy and working with clients to think about corporate responsibility strategies and the whole responsible business agenda.

But I think there have been enormous changes between 2007 and now. Back then it was unusual to be going to clients with the green agenda. Whereas now I think clients are a lot more au fait with it and understand it's a key part of how a business is run.

What is the most important lesson you have learned over the last decade?

To make sustainability relevant to whoever you are talking to. There are different levers you can use with different audiences. If you are going to speak to a CFO think about what their priorities are and how sustainability fits and supports them. If you are going in to speak to a marketing person, what are your different messages there? I think old school sustainability was

***“Some of the jobs we do now won't exist in 10 years because of the rapid rise of technology and AI.*”**

about having your environmental goals and trying to meet them. New-style sustainability is about how we run our businesses better, how we achieve resilience in our companies and be around in 10 or 20 years' time. I suppose it's a mindset shift. The general awareness of climate change and its relevance to business has gone through the roof in the last five years.

Where do you expect to be in 2027?

I don't have a crystal ball. If you had asked me that question back in 2007 I don't think I would have told you I would have a team of 20 people looking after sustainability in the UK's largest property company. The thought back then that a property company would have 20 people dedicated to sustainability, I think that would have sounded ridiculous.

So looking to the future and where I will be in 10 years' time, who knows? But what I hope is that big business will really have sustainability embedded in the top level, so within executive committees and board level, and it will be an integral part of the way companies are run.

What is your vision for the green economy in 2027?

We will see a massive rise in consumer awareness. I think we are starting to see that in pockets but I think by 2027 people will have, for example, air quality monitoring apps on their mobile phones. They will know if their work place is giving them air quality that they are happy with or not. So that kind of consumer activism, I think, will be huge and will drive some important improvements.



Caroline Hill is head of sustainability at Landsec, the UK's largest commercial property company. Previously she spent more than a decade at consultancy giant PwC, advising business clients on corporate sustainability strategy.

What will be the biggest changes to today's world?

The nature of work will change hugely. Some of the jobs we do now won't exist in 10 years because of the rapid rise of technology and AI.

I think we will see some really significant shifts to companies having fewer direct employees, bigger supply chains, bigger pools of contractors they work with, so people have more flexible careers than they have now. For sustainability professionals that means it is essential we really get on top of how we run sustainability through our supply chain now.

What will the future sustainability challenges be?

Climate change resilience. I think we are just starting to see that come in now, particularly with the Task Force for Climate-related Financial Disclosure (TCFD) recommendations from the Financial Stability Board, but I think by 2027 stakeholders like companies and cities will have to show how they are resilient against future changes.

We are already starting to see in some cities the rise of the chief resilience officer - I think that kind of thinking around how cities, how companies are adapting to the changes that will sadly be taking place by 2027 will be huge.

Do you think we will be on course for two degrees?

It depends what day you ask me! Some days I am an optimist. I love the campaign that was part of New York Climate Week this year about being a climate optimist. I think that kind of positive thinking, that we have to get on top of this, is essential.

But then other days I see research of where we are, and what is certain is that currently we are not on track to meet those goals.

But I think the awareness and desire to meet them is ever growing. They are still possible, but there is much more to do and technology has an absolutely critical role to help us achieve that.

If you could invest in one clean technology through to 2027 what would it be and why?

Battery storage technology. Because I think we have seen some fantastic performances, particularly in the UK over the last few months' from wind and solar, but when we start to combine technologies like solar with batteries, that's when I think we are really going to have a bit of a game-changer.

Are you more or less optimistic about the future today than you were 10 years ago?

I am more optimistic, because 10 years ago business and consumers generally weren't even talking about these issues. We haven't done the action we need to do yet, but it's at least on the table now.

MIKE BARRY

Where were you in 2007?

I joined M&S in 2000. So for the first two or three years it was just a question of getting some kind of basic structure in place. It was a business with a very good heart and soul, really good values, but we'd become a little bit out of touch with the new world of NGOs and campaigning, and there was a bit of competition between the retailers to become the most ethical.

So the first two or three years was a question of getting on top of the basic conversation with stakeholders and NGOs. Once we had that basic competence we started to win a few awards, and then an inspiring leader in Stuart Rose came into the business.

Stuart was great because he said: 'I want to be at the heart of a revolution about how business conducts itself in the future. I expect Marks & Spencers to be at the very forefront of that revolution, not a follower or laggard. What does that leadership mean?' And he gave us a three-month homework question to work out what truly transformational leadership means in terms of responsible business. And that was the genesis of the Plan A we know now.

At that starting point there were four things that made it different. It was about systemically tackling all the issues. It was also about the whole value chain and the true impact of a retailer in its supply chain and in the consumer's home. Thirdly, it was about making sure it was integrated into the heart of the business, so it wasn't being run by a small team of auditors and professionals; there was a sense from the start that everyone in the business should know their contribution to Plan A.

Finally, it was about the business case for sustainability, making sure we very deliberately extracted value, both economic and emotional, from doing the right thing in the right way.

How radical an agenda was that in 2007?

There was a sense this was coming and we got there at the right time before everybody else, but it wasn't 10 years ahead of everybody else. It was a year or two.

A lot of those commitments we made back in 2007, we didn't know how we would deliver them by 2012. We made some really bold goals, like 100 per cent sustainable wood in the business and 100 per cent sustainable fish. And when the five years came up in 2012, we missed a few of them.

But on a relative scale the NGOs turned around and said 'well done M&S, that's better than anyone else'.

“Plan A has just kept going, which is not always the sexy thing in life, because you haven't got a new splash, you are just getting on with what you said you would do.”

During my time leading Plan A over the last 10 years every retailer, every business, has had a splash and a programme has been launched, and some of them have been very good. And then there's a sense of hiatus, and there's another programme, and then it goes quiet again.

Plan A has just kept going, which is not always the sexy thing in life, because you haven't got a new splash, you are just getting on with what you said you would do.



Mike Barry is director of Sustainable Business at Marks & Spencer.

He was part of the small team that developed and delivered the company's ground-breaking Plan A initiative, a 100-point, five-year plan to address a wide range of environmental and social issues.

What has been the biggest surprise in trying to implement the Plan A goals over the last decade?

It's been tough and challenging at times – it's the reason I've got grey hair! Sometimes we've known what the solution is, it's just been that we can't quite get as far as we want to get to in the market, because we haven't quite got the money, the investment, or the time.

But the key thing about Plan A is we have kept moving forward on every front. It's very tempting to cherry-pick, and just say 'let's focus on Fairtrade, or let's focus on packaging', and what Plan A has done is it kept everything moving forward at a good strong pace.

The great challenge that we had has been about customer loyalty, and how do you connect your customer with all this wonderful work you have done behind the scenes and how much do they actually want to know? I think what we have found from our customers is that they want to know some of what we do, but they expect the vast majority to just be done by us. 'Don't overwhelm us with a carbon label for every product or a label for every single issue', customers tell us.

I think generally the fourth industrial revolution, the technology revolution that's in our hands now, is critical.

I think we have finally started to find our competence and find our feet this year – 10 years on – of knowing exactly how to connect and communicate with our customers. But it's taken us a bit longer than we perhaps would have wanted.

Do you feel more or less optimistic than in 2007?

I feel more optimistic. Despite the very real and growing evidence of climatic and social challenges the world faces. I think almost things need to get worse before they get better. I think what makes me positive is the sense of disruption that's now happening in the sector.

I think what you are now starting to see - for example with Elon Musk and Tesla disrupting the car industry - are some radical shifts in terms of product and service, the ability to deliver them to the customer, and the customer's willingness to engage with them. People are buying Teslas because they are beautiful aspirational cars that you want to be seen with, as opposed to grudgingly doing something because it's the green option but realistically it's uglier, it's more expensive, it's a compromise on how I would like to live my life.

I think to become a truly sustainable society we have to find ways of really exciting customers that the more sustainable options are actually the better ones for them as individuals, rather than asking them to please do it because it's the greener option.

What will be the real challenges for businesses through to 2027?

I think generally the fourth industrial revolution, the technology revolution that's in our hands now, is critical. It can be a tremendous power for good, in everything from electric vehicles to drones, driverless cars and 3D printing, AI and so on. Or it can be a tremendous power for bad. If a robot can replace a human being, what kind of society have we got in terms of work?

So I think the great challenge for the next decade is how we use that technology revolution to create a truly sustainable approach to consumption, as opposed to allowing things to become much worse than they are today.

What's your vision of the world in 2027?

I want people to be consuming sustainable products and services because they want to, not because there is a law saying they have got to do it, or a tax. I want people to be buying things, and using things, that are fundamentally better for the planet, not just a little bit, but dramatically so, because they are better for the consumer and individual.

At heart I am an optimist. I think we stand at a crossroads, we do have a choice as to whether we turn left or right. And I think we have now got sufficient compelling scientific evidence that business as usual will lead to a very difficult place for humanity.

The planet will survive perfectly well without us, but our way of life might be significantly negatively impacted unless we change things dramatically.

ROBERTA BARBIERI

Where were you in 2007?

In 2007, I was at Diageo, the global spirits and beer company. I was the environmental health and safety director for the Americas at the time and over the course of that year, I helped create Diageo's first full-time, global environmental sustainability role, and then I filled it.

So my job was then to set the company's goals in carbon, zero waste to landfill and water efficiency, establish the working group to get the work done and launch the overall sustainability programme. It was fantastic and fun.

Where do you expect to be in 2027?

I expect to be working on next generation sustainability goals - and to be driving global results on environmental goals. Whatever the details are, what will be certain is that I'll still be getting up every day striving to save the planet. I've been doing it for years and will still be doing it in 2027.

What is the most important lesson you have learned over the past 10 years?

You have to set your own personal prize - and then keep your eyes on it at all times. My prize is to reduce our environmental impact. So if I stay focused on that outcome in all of my work, I get the job done and I also feel inspired as I do it. Once you determine what your prize is and focus on that outcome, in my experience, everything else falls into line.

What is your vision for the green economy in 10 years' time and what do we need to get us there?

I think it's going to take more than 10 years to create a green economy. Right now, progress is too slow and the true disruptors that could catalyse progress are too few. We need more 'Tesla-like' big ideas to get us to a green economy.

"In 10 years, we'll have made progress on water scarcity. So, among our top challenges will be slowing climate change, determining a new role for plastics in the world, and managing the effects of biodiversity loss and natural habitat destruction."

What will be the biggest changes from today's world?

In 2027, the impacts of climate change to our world will be more visible. There will be an even greater presence of plastics in the environment.



Roberta Barbieri is vice president of global water and environmental solutions at PepsiCo.

She has 25 years' experience working in environmental sustainability, including a stint at Diageo where she was the principal architect of the company's sector-leading Global Environmental Sustainability strategy.

Which three sustainability challenges will be top of the agenda in 2027?

In 10 years, we'll have made progress on water scarcity. So, among our top challenges will be slowing climate change, determining a new role for plastics in the world, and managing the effects of biodiversity loss and natural habitat destruction.

You have to be a raging optimist to be in this field. If we're successful, there's hope for a future in which humans are a constructive force on the earth, rather than a destructive one.

Will the world be on course for two degrees in 2027?

I think we are too late to save the world from a 2C change unless someone somewhere figures out some amazing breakthrough. The new 'prize' in my opinion is to adjust to what will be the new normal in 2027 and work hard to keep the change in temperatures to as low a number as possible.

If you could invest in one clean technology through to 2027 which would it be and why?

I'd invest in breakthrough battery storage technology. Imagine if you could drive further without charging your vehicle as often. Imagine how payback periods will change if we could store solar or wind energy on days that the wind doesn't blow or the sun doesn't shine. And if I had to choose another one to invest in, it would be an innovation in carbon capture. I don't know what that piece of equipment is, but we need it. We need a safe way to capture carbon and store it.

What advice would you give to a sustainability professional starting their job today?

Embrace the ambiguity of what we do. Get comfortable with it and get the job done in new ways.

Are you optimistic or pessimistic about the future?

You have to be a raging optimist to be in this field. If we're successful, there's hope for a future in which humans are a constructive force on the earth, rather than a destructive one.

SIMON BOAS HOFFMEYER

Where were you in 2007?

In 2007 I was studying for an MBA in China. I was comparing corporate social responsibility (CSR) in China with Europe, and looking at how to ensure a knowledge transfer was happening from Europe to China.

So that was where I started off with my more practical experience within sustainability, but at the same time I was actually working for Carlsberg in their communications and company branding department, helping define the first Carlsberg Group CSR strategy.

So going forward to 2017, how has the approach evolved?

In 2007 we started getting our house in order, aligning our policies by ensuring that in the company we had minimum standards that were adhered to, and also ensuring really good structured reporting and communication of data from all of our subsidiaries across the world.

So in those first years we were really focused on getting the CSR framework up and running, including governance in the business, to ensure CSR was taken into account in all the business decisions. And then of course, publish annual progress to stakeholders.

After that we moved into a more topic-specific era, where we focused on partnerships within packaging, using the cradle-to-cradle design framework, and working with suppliers through the Carlsberg community.

A lot of our impact is outside our direct sphere of influence. Therefore we really looked beyond our own fences into the supply chain.

Now I think with our new programme, Together Towards Zero, we have really combined the best of all the things we have learned in the past, and started looking at these long-term ambitions and really connect that with medium and short-term achievements in order to keep up the momentum.

What is the most important lesson you have learned over the past 10 years?

You need to integrate sustainability into the business – a lot of people are talking about it, but really doing it involves engaging your internal colleagues in all the different parts of the business. That is definitely something that we have become much better at over the years.

In 2016 we did training sessions with more than 7,000 colleagues on our ethical behaviour, in our work with society and sustainability, and how we interact with each other internally. So we did real on-the-ground training where we got so much great feedback from colleagues, and that impacted on the Together Towards Zero strategy. It really ensured a much better internal alignment and actual integration than we have seen in the past years.

The difference was really being able to get from management senior level to real employee level. Mobilising and engaging employees, even where there might not be a direct impact, that is really valuable, and that provides a lot of input and excitement into projects that wouldn't appear otherwise.



Simon Boas Hoffmeyer is sustainability director at Carlsberg. Earlier this year he launched Together Towards Zero, a major new sustainability strategy that will see the brewer target zero carbon emissions at its breweries worldwide by 2030.

Where do you expect to be in 2027?

Now that we have set out 2030 targets I would expect I will be part of making sure that is brought to life - but of course you never know what will happen! I do think Together Towards Zero is an incredibly exciting journey over the next 13 years, and I would hope to see it to the end in order to ensure we achieve our targets and we deliver the business and societal value that we set forward.

What is your vision for the green economy in 10 years' time?

2027 is definitely past the point where we should have seen gigantic strides to achieving the SDGs and the Paris Agreement. Those two activities, they are to me two of the most prominent current activities and visions for the future that the world has set forth.

So what I would expect in 2027 is that we have actually moved beyond the Paris Agreement, and to some extent the SDGs, and that we have started discussing planetary boundaries to a much larger extent.

And we will also in 2027 hopefully have seen the rate of innovation go way beyond our expectations, meaning we will have technologies and abilities to live more sustainable lives as consumers and companies that we do not see in 2017.

What will be the biggest changes from today's world?

The speed at which we will be able to disseminate new technology I think will be much bigger.

When you look at solar, when you look at wind, when you look at these types of renewable solutions, if they were invented in 2025 I think you would see it reaching scale much faster.

So for me, that is likely to be the biggest change - our ability to quickly scale solutions that can make a real impact.

Which three sustainability challenges will be top of the agenda in 2027?

The discussion around the planetary boundaries and all the different aspects of that I think will be crucial. For example, arable land for food production - I think topsoil quality and nutrients in our soils will be one of the key topics, not only in 2027 but probably earlier.

I also think the issue of water will be key in ensuring access and high quality of water.

And then there is the rare earth minerals and metals in some of the electronics we use - that will increase in prominence over the coming years.

Will the world be on course for two degrees in 2027?

I think we will get there. For me, the tipping point was Paris. Regardless of what some world leaders are saying, I believe that we will reach it, and I also have faith in us reaching the more ambitious target of 1.5C.

The reasons are many. I see commitment from businesses through, for example, the RE100, the We Mean Business Coalition, and through the opportunity side of sustainability. That has really made me an optimist. I also see the world uniting in general on, for example, the SDGs - just the fact the SDGs were approved in the UN General Assembly unanimously is a very strong signal about us having a global vocabulary for sustainability and sustainable development.

I'm not saying there won't be difficult times ahead or actions carried out by world leaders or other companies that go against this, but in general I am an optimist and have felt like that ever since I stood in Paris and witnessed the agreement being approved.

If you could invest in one clean technology through to 2027 which would it be and why?

The Carlsberg Foundation has just invested \$80m in impact investments in sustainable agriculture, water technologies and low-carbon fuel alternatives. So they singled out these three investment areas. If I had that type of money I would have done the same.

To be able to have an impact requires you as a sustainability professional to equally be a salesperson internally, a strong project manager, and have an insatiable interest in how the business works.

What advice would you give to a sustainability professional starting their job today?

Remember that to be able to have an impact requires you as a sustainability professional to equally be a salesperson internally, a strong project manager, and have an insatiable interest in how the business works. Those are three key things it takes to be a successful sustainability professional, because those are really the ingredients for achieving things in a business.

BOB HOLYCROSS

Where were you in 2007?

For Ford and the industry we were just getting in to the global financial crisis. We were on the cusp of our global transformation programme. It was very different to the transformation we are going through today; we were really on the cusp of figuring out how to survive.

At the same time, sustainability wasn't a new thing for us even in 2007. We have been doing formal sustainability reporting as far back as 2000 and given our heritage and legacy sustainability has always played a prominent role in the company in one form or another.

Where would you expect to be in 2027?

If you look 10 years from now, we would see ourselves very much on the leading edge of being an automobile and mobility company. And by that time the broader industry might even be described in terms of the overall mobility operating system.

For us, our goal over the next five or 10 years is to be front and centre in that discussion. The real thing for us is how we continuously innovate to deliver all the products that can make that work.

By 2027 we will see a lot more products that are electrified, we should see smarter vehicles, vehicles that are connected to the cloud and each other. With the work we are already doing in that space, the goal would be to have all those technologies penetrate as much of the way through the fleet as possible.

What has been the biggest lesson you have learnt as a sustainability executive over the past 10 years?

That's a really important question, lessons learnt are always important. For us and Ford, and even for me personally, recognising the importance of integrity in the process has been an important lesson. It is not just about the products and services you produce and offer, but the manner in how you do it. Ford has been recognised as one of the most ethical companies through the work Ethisphere has done. I think our sustainability reporting and the transparency that we have continued to provide is important.

Innovation has to be there by default.

Integrity matters and we have seen in our industry where that has been challenged. I think that can be a big wake up call for some, that if you don't do it the right way some of the metrics may improve, but that really won't make a difference if people aren't buying your products because you are not doing it with the right level of integrity.



Bob Holycross is vice president of Sustainability, Environment and Safety Engineering for Ford in Europe, Middle East and Africa. He is responsible for the development and implementation of the company's environment and safety strategy, policy and performance in Europe.

Previously, he was director of Global Certification and Program Compliance for Ford's Sustainability, Environment and Safety Engineering organisation.

He has chaired government and industry committees, testified before federal and state government bodies on environmental and energy matters, and moderated third-party technical panels through organisations such as the Society of Automotive Engineers (SAE) and the US Chamber of Commerce.

What do we need to do to deliver on the vision of a cleaner, smarter fleet over the next decade?

Innovation has to be there by default. Beyond that it is a question of how do we connect the right government policies globally, given the societal concerns around air quality and congestion.

The toughest thing we have seen with electrification has been the difficulty of matching the ambitions of regulatory targets with customer demand. In some cases we have had experience with technology mandates in the US in particular where we recognise what the goals are and where we need to get to, but if we have policies that are too short-sighted or too tech-specific the risk is we bring in technologies too early that don't resonate with customers. Then the brand of those technologies is damaged even if you then make progress.

This isn't about resisting increasing the pace of electrification, it is trying to do it in a manner that considers all the broader requirements and use cases.

There isn't some sustainability widget you bolt on at the end, you have to integrate it throughout the product design cycle and the operations.

One example for us is, as we are making investments in products for 2020 and beyond, we have to look at investments that will be required in infrastructure to charge vehicles. We have entered into a partnership with a number of companies in Germany to look at the high-speed charging network on motorways. We are going to have to work with others in the industry and with policymakers to make all of this work.

Do you think we will be on track to keep temperature increases below 2C by 2027?

I like to think we'll be on course. But whether or not we are on track is not going to change what we try to do. We will be working to continue to improve fleet efficiency and electrification year over year. In addition to regulatory targets we also set our targets complimentary to 2C or the 450ppm stabilisation concentration.

If you could invest in one clean technology through to 2027 what would it be?

That's a tough one, as there's no silver bullet and I know this will be the expected answer. But when I look at it I think about vehicle connectivity. The ability of vehicles to connect with one another and with the transport infrastructure - the investment in that technology is really going to be the foundation for everything else. To get at these issues like congestion and ride services and the underlying mobility operating system, that connectivity will be key.

It's not as simple as putting a modem in the car, there are considerations for cyber security and privacy and how vehicles react on the fly. It is a very complex web of innovation we will have to work through, but I consider that to be a key enabler for clean technology.

What advice would you give to a sustainability executive starting their career today?

The one thing for me has been the need to embed yourself in the operations of the company. You can't think of sustainability as what you do after the product has been designed or manufactured. There isn't some sustainability widget you bolt on at the end, you have to integrate it throughout the product design cycle and the operations. That has been the most exciting part of my role. The other thing is you need to keep an open and curious mind. The pace of change is phenomenal and you have to stay curious to be effective.

Are you an optimist or a pessimist for the next decade?

I am absolutely an optimist. When you are going through a big transformation and there is that level of uncertainty you can be pessimistic or scared to take the leap. But I am optimistic because we have the best people in the industry, we have the financial foundation, and we have the leadership.

I am an engineer by training and I still continue to be amazed with the ingenuity I see with some of the new technologies our engineers are coming up with. When you see that innovation, you can't be anything but optimistic.

KATE WYLIE

Where were you in 2007?

I was at Ebay working on the sustainability strategy there. The world then was still exploring what sustainability was. You had to do a lot more explaining of the fundamentals.

Whereas now everybody understands climate change, understands water scarcity, at a high level at least, and there's much more focus on the 'how', rather than the 'what'.

What is the most important lesson you have learned over the last 10 years?

How to drive change within a business. One of the most important lessons I have learnt is to put myself in the shoes of the people I am working with. You need to understand where someone is coming from if they are in procurement, or if they're a general manager running a business unit, or the CEO of an organisation.

Put yourself in their shoes and understand their needs, and then work together on how you can deliver change.

Where do you expect to be in 2027?

I would love to still be working in this area, to look back on the last 10 years and be very proud of the delivery both that I have helped lead and seen others lead.

What is your vision for the green economy in 10 years' time?

First of all, let's all just sign up to the 'what'. Let's assume we all agree on climate science, then let's sign companies up to Science-Based Targets (SBTs), and then let's try and drive leadership on the 'how'.

We will need a much more open and honest dialogue about what is working and what is not working. That's a challenge. Companies are very used to talking about the good things!

We are going to enter some really interesting forms of collaboration in order to get there, particularly when you start looking at issues like water.

What will be the biggest changes from today's world?

I think what we will start to see more and more is that sustainability will either become standard operating procedures, or a standard part of products and services - so consumers might not even know about it - or it will become standard in a way that they do know about it and they can just talk about it naturally.



Kate Wylie is global sustainability director at Mars, where she led this year's launch of its Sustainable in a Generation strategy. With 15 years' experience in corporate sustainability under her belt, Wylie has helped shape environmental strategy for the likes of eBay, Barclays, and Etsy.

What top three sustainability challenges will be top of the agenda in 2027?

I think today the challenge is still getting people aligned on the SBTs, but in the future everybody will have signed up, everybody will be driving that charge, and we will be getting much more technical. For example, when you are working at the watershed level, when you have farmers who are both upstream and downstream, how does that actually work when you're trying to address water challenges?

Secondly, we will need a much more open and honest dialogue about what is working and what is not working. That's a challenge. Companies are very used to talking about the good things! I think that's something Mars hopefully has created a safe space for - to start discussing some of the complexity and how we can have an open and honest dialogue together to solve those problems.

Thirdly, there will be a lot more evidence on the win-win for business. That again will be standard practice, and it will be more about the laggards behind helping catch up on that.

Will the world be on course for two degrees?

I'm very positive about this. Particularly with the energy that we saw from Climate Week NYC.

This area is going to get much more technical. If you look at the journey we have gone on, 15 years ago I was explaining to people what a carbon offset was and what climate change was. Then you went into 'well, is it relevant for business?' Now we are into, 'OK, what do we need to do?'

The number of companies on track to do this, some of the innovation that is starting to happen now in technology, the leadership we are seeing, and the fact the business case is there. That all gives cause for optimism.

If you could invest in one clean technology through to 2027 which would it be and why?

I would go for renewables in emerging markets. Because I think there is such growth potential there when you look at how it's developed in other countries. My husband also works in it too, which helps!

What advice would you give to a sustainability professional starting their job today?

This area is going to get much more technical. If you look at the journey we have gone on, 15 years ago I was explaining to people what a carbon offset was and what climate change was. Then you went into 'well, is it relevant for business?' Now we are into, 'OK, what do we need to do?'

I think the next stage is the 'how', and the technical side of things. So for people starting out now, I would always recommend they bring in one area of technical expertise as a foundation that you can build on.

JAMES MURRAY

Where were you in 2007?

I was working on the launch of BusinessGreen, building the reach of the blog that it grew out of, and working with the team at Incisive Media to deliver the full website.

It was a lot of work, especially when you consider we were launching into what would turn out to be some pretty horrendous economic headwinds.

But we are still here and still growing a decade on, and I like to think we have delivered on our vision to provide the green economy with the news and analysis it needs. It would also be nice to think we've played a small role in helping to push green economic thinking into the media and corporate mainstream.

Where do you expect to be in 2027?

Who knows? The economy and the media industry are changing so fast it is hard to look too far ahead. I'll still be working on environmental issues in some capacity though – that's a life-long project now that I can't ever see myself walking away from. And I still love writing and learning from fascinating people, so if I can continue to combine those passions I'll be pretty happy.

What is the most important lesson you have learned over the past 10 years?

Twitter is a huge drain on daily productivity.

More seriously, I think my understanding of the all-encompassing nature of the low-carbon transformation is the single biggest lesson.

Too many people still don't understand the scale of the risk and the scale of the opportunity we face. Naomi Klein called her book on climate change *This Changes Everything*, and while I don't agree with all her analysis, it is a brilliant title, because the climate crisis really should change everything. We, as a green economy and environmental campaigners, still haven't worked out how to communicate the immense reach of the clean industrial revolution that is already underway.

There is some fascinating work going on in material science - light-weighting materials, graphene, sustainable plastics, manufacturing from captured carbon. It's not particularly glamorous, but it could be transformational.

The other big lesson is the carbon bubble hypothesis – the unanswerable logic of that argument really should prove to be a game-changer and every economics and MBA course on the planet should be teaching it.



James Murray is editor-in-chief of BusinessGreen, having led the brand's editorial coverage for the past decade.

He co-founded BusinessGreen in 2007 and has overseen the website's expansion and the development of BusinessGreen's events and commercial offering since then.

A journalist since 2002, he comments widely on the green economy, clean technology, and the climate crisis.

What is your vision for the green economy in 10 years' time and what do we need to get us there?

By 2027 we need to be clean and ultra-low carbon in the areas where we know how to decarbonise. That means an extremely low-carbon grid, built around renewables and some nuclear (assuming Hinkley Point is online by then). It means electric vehicles with long ranges dominating the national fleet, and it means a step change in energy efficiency.

That needs to be accompanied by a sharp increase in R&D spend in the areas where decarbonisation will be difficult, such as aviation and industry.

The good news is all of that is entirely deliverable if the transition is finally treated with the urgency it requires by business and political leaders. A few more Teslas and a strengthening of the Paris Agreement around 2020 could put us on track. That is why I am so worried about Brexit, it risks distracting everyone from what needs to be done just as we enter this crucial decade.

What three sustainability challenges will be top of the agenda in 2027?

I'm hoping the agenda will be dominated by the next phase of decarbonisation, rather than a continuation of the tired debate about the efficacy and cost of existing clean technologies. If I still have to write pieces in 2027 explaining that electric vehicles and wind farms won't actually crash the grid then we're all screwed.

So I hope by 2027 the debate is focused on curbing emissions from agriculture or delivering genuinely green flight or making scalable negative emissions technologies a reality. I also fear we are going to be talking a lot more about climate resilience by then – that seems tragically inevitable.

Will the world be on course for two degrees?

I doubt it, which is why negative emissions technology is so important.

If you could invest in one clean technology through to 2027, which would it be and why?

The obvious choices would be solar and storage due to their remarkable cost reduction curves. But if you want an investment tip I suppose you want an area that is undervalued currently. There is some fascinating work going on in materials science - light-weighting materials, graphene, sustainable plastics, manufacturing from captured carbon. It's not particularly glamorous, but it could be transformational.

I also think we'll see a lot of important innovation around business models and financing models. There's been a huge amount written about the servicification of the economy and that could continue to be the dominant story of the next decade. Related to that is the recognition that if we can get financial services right we can remove the cost barriers to clean technologies.

The amazing businesses and technologies we write about every day do allow for some optimism to break through.

I'm also excited by some of the moon-shot ideas. We need to find a way to capture atmospheric carbon emissions and we are long overdue a technology revolution in agriculture. Both areas could offer fertile territory for investors.

What advice would you give to a sustainability professional starting their job today?

I'm afraid it would be all the same old patronising stuff that people in the workplace always tell young people entering the workplace. Work really hard on mastering the basic skillset – learn how to write and communicate and work well as part of a team. Keep reading. These issues are evolving too fast to ever think you have got a handle on it. And recognise that while you are engaged in a project of epic importance, not everyone understands that, so finding effective ways to make the case for sustainable action is crucial.

Are you optimistic or pessimistic about the future?

I'm quietly pessimistic, I think, but as a relatively new parent I find that hard to admit. We've made immense progress in the past decade, but we have not gone far enough or fast enough, and Trump and co feels like a pretty serious backlash.

I got quite frustrated recently at the #climateoptimist campaign, which to me, perhaps unfairly, felt like an attempt to gloss over the scale of the challenge we face and a promotion of the idea that if we all just believe hard enough that everything will be OK then we will all be fine. Unfortunately, it is going to require a lot more than that.

That said, the amazing businesses and technologies we write about every day do allow for some optimism to break through. We do have many of the technologies we need to decarbonise. The mission now is accelerating their development and tearing down the barriers to deployment.

Someone mentioned the old Gramsci line recently, 'pessimism of the intellect, optimism of the will'. That feels about right.

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