

Climate and Energy Experts Debate How to Respond to a Warming World

Experts in energy and environmental fields weigh in on the need for an urgent transition to alternative energy.

By The New York Times

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As energy demand rises around the globe, so does concern about climate change. The science seems clear: Ninety-seven percent or more of scientists active in the field are convinced the climate has been warming over the past century, the pace of warming is accelerating and human activities — particularly the burning of coal, oil and other fossil fuels — are a primary cause.

Many of these scientists also concur that the best option to mitigate the potentially catastrophic consequences of climate change is to reduce the use of fossil fuels and speed up the transition to renewable forms of energy, such as solar and wind.

We asked experts in the energy and environmental fields whether they concur on the need for an urgent transition to alternative energy. And if so, how the energy industry can make that happen quickly enough to matter. We also asked energy executives how their companies would navigate such a fundamental change. The responses have been edited and condensed.

Mark Stein

May Boeve

Executive director, 350.org



Rapidly phasing out fossil fuels is critical to address the climate crisis because fossil fuels are the biggest driver of the climate crisis. Reports from the Intergovernmental Panel on Climate Change based on the work of thousands of scientists have confirmed there are no scenarios in which we both keep digging out fossil fuels and keep the world from a climate disaster. We must act now, and decisively, to switch to alternative sources of energy.

What little has been done is not nearly enough. Research published by the Stockholm Environment Institute shows that despite all the rhetoric about transitioning to renewable energy, the world is on track to produce 120 percent more fossil fuels than would be consistent with limiting global warming to 1.5 degrees Celsius, the goal set by the Paris Agreement in 2015.

I want to be clear: the coal, gas, and oil industries cannot make this happen on their own; markets are not going to get us out of the hole they got us in. We need the political will to fundamentally rethink some of the underlying assumptions about how we organize our societies. This is why we call for a global Green New Deal.

We can do it because people want it and are increasingly demanding it. Technology is an important part of the coming transition, and so is finance. But what is going to make it happen is public outrage, public imagination, and public inspiration.

Sean Comey

Senior adviser, corporate issues, Chevron



We believe climate change is real and human activity contributes to it. We recognize the findings of the Intergovernmental Panel on Climate Change (a United Nations research agency) that the use of fossil fuels contributes to increases in global temperatures. Chevron shares the concerns of governments and the public about climate change.

At the same time, the International Energy Agency (I.E.A.) projects global energy demand will rise more than 25 percent by 2040, driven by population growth and rising incomes. Even in the I.E.A.'s most aggressive low-carbon scenario, oil and natural gas will meet approximately half of that demand. Chevron has responded by establishing targets for emissions intensity — the amount of pollution created per unit of energy produced — and tying these goals to employees' pay. Chevron also is lowering its carbon intensity at the lowest cost, increasing its use of renewable energy to support its business and investing in promising technologies.

Reducing greenhouse gas emissions is a global issue that requires global action. We support a price on carbon as a possible way to reduce greenhouse gas emissions by the end user, but governments must decide which pricing system is best for their citizens. We work with governments to address potential climate change risks while continuing to produce affordable, reliable and ever cleaner energy.

Bob Dudley

Group chief executive, BP



The world is on an unsustainable path. We need a faster transition to a low-carbon energy system and a net-zero-emissions world. The last thing I want is a delay today that results in an abrupt, precipitous course-correction tomorrow. What's good for the world is good for BP.

And what's more, the oil and gas industry has the scale, expertise and resources to help the energy transition happen. This year alone BP will spend around \$750 million on low-carbon activities, including wind, solar and electric-vehicle charging.

But a growing, more prosperous world needs growing quantities of energy, and that includes oil and gas. Today, one billion people lack the energy they need, and renewables alone can't meet those needs. In fact, the International Energy Agency projects the world could still need nearly 70 million barrels of oil a day in 2040 — and that's in a scenario consistent with the Paris Agreement goal of keeping any rise in global temperatures well below 2 degrees Celsius. Of course, how we use that oil and gas will change. Electric cars don't burn petroleum, but they do use plastic in their construction and oil in their lubrication. And gas can be decarbonized.

Energy companies like BP have a bright future because we are evolving to serve the energy transition. But it's a dual challenge; we need to reduce emissions while increasing energy. That's the goal I have set for BP.

Mark Elder

Director, Research and Publications, Institute for Global Environmental Strategies



Obviously the world must reduce its reliance on fossil fuels and accelerate its transition to renewable forms of energy. Who wouldn't agree? Is it necessary to ask? Soon it may become clear that scientists were too cautious about the speed and magnitude of global heating and its consequences.

Arctic and Antarctic ice is melting much faster than expected, so rising sea levels will threaten coastal cities. The permafrost in Alaska, Canada and Siberia has melted nearly enough to release vast quantities of methane, greatly accelerating global heating. Fossil fuels, including natural gas, need to be rapidly phased out to minimize the worst effects of global heating.

Utility-scale renewable energy combined with battery storage is now technically feasible and economically competitive with fossil fuels in many cases, so many electric utilities are already shifting to renewables. Fossil fuels cannot compete without large government subsidies and assistance. Fossil fuel producers face enormous financial losses as oil and gas reserves and coal mines lose their value, becoming stranded assets.

These companies could shift their focus to ecosystem restoration to repair the damage caused by fossil fuel extraction, possibly with government assistance. It might not offset the losses from stranded assets, but it could provide replacement jobs for the workers. Wind turbines could be erected on old oil drilling platforms. Carbon capture and storage uses large amounts of energy and is very costly, so it probably will not be feasible. Investors are advised to steer clear of companies with large fossil fuel operations.

Nat Keohane

Senior vice president, climate, the Environmental Defense Fund



Climate change is an urgent crisis that's damaging our economy, our planet, and our children's future. To prevent the worst impacts, we must achieve a 100 percent clean economy in the United States and other advanced nations by 2050 at the latest, and in the rest of the world soon after. A 100 percent clean economy means we produce no more climate pollution than we can remove.

Achieving this ambitious goal will require policies that guarantee steep reductions in emissions, drive massive investment in clean energy and find ways through nature and technology to remove carbon from the atmosphere. The best science says that we must do all these things.

The reality is that solving this fast enough will take action from Congress. The core policy should be an enforceable, declining limit on climate pollution to ensure that we meet the 100 percent clean goal, achieved through a flexible, market-based approach that creates incentives for businesses and entrepreneurs to find the fastest and cheapest ways to get there. We also need to invest in innovation, reduce barriers to clean energy and energy efficiency, support more resilient farms and forests, and ensure a just and equitable transition for communities throughout America.

Mark Little

President and chief executive, Suncor



Reliable and affordable energy is critical to our quality of life, and we will need to responsibly harness all forms of energy if we are to meet growing global demand and simultaneously tackle the challenge of climate change.

The choice is not between fossil fuels and renewable energy, but rather, how do we accelerate the growth of renewables while reducing greenhouse gas emissions from the use of fossil fuels.

At Suncor, we're optimistic that collaboration and innovation enable us to do both. While transforming the energy system is one of the most complex tasks the world has faced, we can accelerate progress. We're seeing businesses mobilize and collaborate on climate action like never before.

Last year, for example, we invested 635 million Canadian dollars to develop and deploy technology in this field, including innovations that could reduce greenhouse gas emissions from operations by up to 80 percent. Our Fort Hills oil sands mine uses paraffinic froth treatment technology to cut the greenhouse gas emissions intensity of each barrel of oil produced there to be on par with the average refined barrel in North America.

We also are investing in energy-efficient cogeneration technology to reduce emissions from burning petroleum coke and export low-carbon power to Alberta's grid so the province can transition from coal-based power generation. This will reduce greenhouse gas emissions by 2.5 million tons per year, equivalent to removing 550,000 vehicles from the road.

Mark Anthony Gyetvay

Chief financial officer, Novatek



Climate change is the defining topic of our generation and ultimately impacts everyone and all companies globally. It is our responsibility — the oil and gas industry — to ensure that we are doing everything possible to mitigate our carbon footprint and facilitate the transition to clean-burning energy. With energy demand forecast to rise over the coming decades, we must ensure affordable and secure energy supplies are available in a sustainable manner.

At Novatek, sustainable development is integral to our corporate strategy and embedded in our decision-making process. When we consider development projects, such as our large-scale liquefied natural gas projects, the ecological and environmental impacts are fully studied and plans are implemented to mitigate negative consequences. We engage all of our stakeholders in the review process.

Although climate science is calling for the reduction in fossil fuels, I believe the imminent demise of fossil fuels is overstated and the rapid transition to renewable sources of fuels will not solve this existential question. Natural gas is a clean-burning fuel and will be an important part of this energy transition. We will do our part to facilitate this energy transition by promoting natural gas as part of the climate change dialogue and solution.

Sir Mark Moody-Stuart

Chairman, Global Compact Foundation



UN Global Compact

Undoubtedly yes, the world must accelerate its transition to renewable energy.

First, we all need to unite to support regulatory and fiscal frameworks, using taxes or market mechanisms to establish a carbon price high enough to drive significant change, with proceeds used to support those negatively affected parts of society.

However, price is not the whole answer; the poor are more adversely impacted by pricing, so we should mandate strict performance standards for technologies or ban some energy sources unless mitigated.

Cost is no longer a major barrier for renewables; intermittency is. So we need to develop technologies to store energy for periods of little or no wind or sunshine. Batteries are one answer, but they face scale, resource availability and environmental challenges. An alternative is to use spare capacity at times of high renewable availability to split water into oxygen and hydrogen. The hydrogen can then generate electricity or drive heavy transport, aircraft or processes not easy to electrify.

Finally, renewable-energy projects are currently less profitable than oil and gas projects. The challenge for oil majors and their investors enjoying high dividend yields is how to profitably apply their cash flow and project skills in the new energy world.

Bjarne Pedersen

Executive director, Clean Air Asia

The science on how human activities — predominantly the use of fossil fuels — have caused and continuously aggravate the impacts of climate change is indisputable. An accelerated shift to renewable energy is necessary not only to mitigate the impacts of the global climate crisis, but also to provide safe and clean air, particularly in Asia, which bears the highest health burden from air pollution.

Only 2 percent of Asia's cities meet the World Health Organization's guidelines for exposure to soot and other small particulate matter of 2.5 microns or less in diameter, which cause cardiovascular and respiratory disease, and cancers. Despite this, Asia is set to contribute half of the projected global expansion of coal-fired power plants. In Southeast Asia alone, it is estimated that coal emissions will increase premature deaths to 70,000 annually by 2030, from an estimated 20,000 today.

The role of the private sector is critical to the needed shift to renewable energy. Divesting from coal-powered energy generation and investing in renewable energy is imperative, particularly in Asia, where energy demand is increasing.

With millions of people in Southeast Asia still without access to electricity, and with the rapidly declining costs of renewable energy technologies, there is huge potential for its use on remote islands and in areas not easily accessible to the national grid. Equally important is investing in, and placing emphasis on, sustainable transport and clean energy solutions for buildings and consumers.

Erich Pica

President, Friends of the Earth

Transitioning to renewable energy is not only necessary to fight the climate crisis, it is also the only way we can quickly and effectively meet rising energy demands. It is foolish to think, however, that the fossil fuel industry will eagerly embrace this transition. We must push governments to enact an ambitious climate strategy that phases out all fossil fuels and transitions to a sustainable economy.

Over a billion people around the world lack access to electricity, and increasing fossil fuel-based generation will not fix this. Coal and nuclear power plants are expensive boondoggles. Communities living in energy poverty are continuously left in the dark without access to the grid as corporations sell power to industrial users and for export to recoup the costs.

Renewables, particularly small-scale renewables, are cheaper and faster to install. Small-scale renewables also tend to generate and keep power locally. This becomes a more effective way to fight energy poverty. Renewables are cheaper than nuclear, can compete with gas, and their price continues to fall. Rapidly phasing out fossil fuels and transitioning to renewables is the only choice for the climate and the economy.

Patrick Pouyanné

Chairman and C.E.O., Total

Science and market trends are clear: the world energy mix will evolve. But the debate is about the capacity of the world to adopt the right pace of change. The energy world is facing two challenges: providing affordable energy to a growing population and efficiently addressing climate change. For many emerging countries, the first challenge is paramount. This is why we engage resolutely in adapting the energy pattern and finding an acceptable gradual pace.

With the digital economy, a host of products and services are "going electric." As a result, demand for electricity is surpassing demand for other forms of final energy. In this environment, all fossil fuels are not equal. For an equivalent energy content, gas emits half as much carbon as coal in power generation.

Total has been an “oil producer” for nearly a century, but now it is a major “energy player” that produces and markets fuel, natural gas and low-carbon electricity. Climate issues are central to our strategy in all four of our priority areas. In particular, we aim to:

Develop our leadership in the integrated gas value chain, the cleanest fossil fuel and an essential alternative to coal.

Grow in low-carbon electricity from power generation to power storage and sale to end customers.

Focus on low-cost oil for petroleum products and develop sustainable biofuels.

Develop businesses necessary to carbon neutrality, such as energy storage technologies, energy efficiency services, nature-based solutions and carbon capture and storage.

Shyla Raghav

Vice president, climate change, Conservation International

Our dependence on fossil fuels for energy — and, actually, the entire global economy — is unquestionably the largest cause of the greenhouse gas emissions driving the climate breakdown. Science suggests that avoiding the worst impacts of climate change requires global emissions to peak in 2020 and decline rapidly to net-zero by 2050. This will be possible only through a large-scale shift to clean, renewable energy.

This may seem nearly impossible, but wind and solar technologies are doubling in capacity every four years. If we prioritize policies such as carbon taxes and shift to circular production and consumption systems, achieving net-zero emissions is possible, even in the sectors that are the hardest to abate such as cement and chemicals.

However, just decarbonizing our economy will not by itself be enough to solve this crisis — for that, we need nature. The world's carbon-rich ecosystems — tropical forests, mangrove swamps and peat lands — store more carbon than the entire atmosphere. Their destruction contributes to climate change, so we need a transformative shift in how we protect and manage such ecosystems as well as how we produce and use energy.

These fundamental transformations won't happen on their own. Business and political leaders must heed consumers' and voters' demands for action, and promote changes via tax incentives, carbon pricing and investments in solutions available today. People can help by limiting their air travel, avoiding single-use plastics and shunning products that drive deforestation. This may all seem daunting, but with the right incentives and leadership, change will be inevitable. Our future depends on it.

Ajay Singh

Head of strategy and commercial, Japan Petroleum Exploration Company

I agree completely that the world must rely less on fossil fuels and accelerate its transition to renewable forms of energy. But it's a tall order. Consumption of fossil fuels is actually increasing, whereas scientific assessments call for it to reduce drastically — for instance a total phase out of coal and a 50 percent reduction in hydrocarbons by 2050 — if we are to limit global warming to 1.5 degrees Celsius (2.7 degrees Fahrenheit).

The fact is that the world has an abundance of hydrocarbons, the cost of producing them remains relatively low, they can be conveniently used in most applications, and investment in oil and gas assets generally remains financially more attractive than that in renewable energies. Shareholders do not necessarily like the prospect of lower returns that might result from a greater push into renewable energies. More widespread carbon taxation would help align investment behaviors with societal imperatives.

Meanwhile, further growth in renewable energies such as photovoltaic solar and wind — which are competitive in their own right against hydrocarbons and coal in certain regions — is being impeded by the lack of cost-effective electricity-storage solutions.

Next-generation technologies — such as using electrolysis to produce hydrogen fuel by splitting water — can accelerate the transition by providing effective energy storage and, in some cases, by exploiting synergies with the oil and gas industry.

Jean Su and Kelly Trout

Co-chairwomen, Energy Working Group, Climate Action Network

The science is clear: We must rapidly slash fossil fuel consumption by 2030 and keep 80 percent of the remaining fossil fuels in the ground to avoid climate catastrophe. At the same time, renewable energy is reaching cost parity with fossil fuels. The barrier to a 100 percent clean and renewable energy future is no longer technology and economics — it's sheer political will.

But our political system is broken. Despite their knowledge that fossil fuels drive the climate emergency, fossil fuel producers have been suppressing this science, obstructing clean energy from reaching the grid and delaying this transition for decades. When companies like Exxon, Shell and BP invest in extracting more fossil fuel out of the ground, they lock us into high-carbon infrastructure, and that drives more fossil fuel consumption — exactly what these companies want.

The public, reflected in the millions of students and adults striking around the world last month, knows we cannot rely on the fossil fuel industry to stop drilling us into disaster. Instead, our political leaders must say no to new fossil fuel projects and finance and invest in a 100 percent clean and renewable energy system, creating good-paying jobs and protecting communities in the process.

Ms. Su also is the energy director and staff attorney at the Center for Biological Diversity; Ms. Trout also is a senior research analyst at Oil Change International.

Mark Watts

Executive director, C40 Cities

We are in a climate emergency, and we need to start acting like it.

Despite all the scientific evidence, a small group of powerful nations and companies are still blocking attempts to curb greenhouse gas emissions. Allowing global temperatures to rise far beyond 1.5 degrees Celsius above preindustrial levels risks the extinction of human civilization. That is why mayors of the world's big cities are so committed to urgent action.

They also recognize the benefits that will come from shifting our economies off fossil fuels: Cities in the future could enjoy affordable and reliable public transport; clean air; buildings that could be cheap to heat and cool; waste that can be reused or recycled rather than going to landfills. Mayors are using all the powers they have to shift markets and shape consumer choices — buying electric buses, for example, and creating low-emission zones in their city centers.

In the absence of meaningful leadership from the intergovernmental system, more than 70 mayors are gathering in Copenhagen for the C40 World Mayors Summit. Working with business leaders, investors, civil society, scientists, and young climate activists, mayors will be taking responsibility for stimulating a scale and pace of action that can avert climate breakdown. This is the future we want, and it is still within our grasp.