

wknd lifestyle

LET'S FACE THE FACTS TOGETHER



1.1°C

The extreme climate events that we have witnessed over the past two years, floods, wildfires, heatwaves, tropical storms and more, are the result of an increase of 1.1 degrees Celsius in average global temperature over pre-industrial levels (defined as the levels on record for the period from 1850 to 1900).

IPCC

ACCORDING TO THE LATEST ASSESSMENT OF THE INTERGOVERNMENTAL PANEL ON CLIMATE CHANGE (IPCC), IN A REPORT RELEASED ON AUGUST 9, ITS SIXTH MAJOR ASSESSMENT REPORT SINCE ITS FOUNDING IN 1988, THIS IS ONLY THE BEGINNING.

1.5°C

4.4°C

Global warming will likely reach or exceed 1.5 degrees Celsius over pre-industrial levels within the next two decades. This decade's actions will determine whether we can contain global warming at these levels and avoid worse climate consequences.

If emissions continue at the current pace, estimates suggest average temperatures over India are likely to rise by 4.4 degrees Celsius over pre-industrial levels by 2100.

WHERE WE STAND

5 hottest years
The last five years (2016, 2017, 2018, 2019 and 2020) have been the hottest on record since 1850.

Since the 1950s, practically all of the world's glaciers have been retreating at the same time, an event unprecedented in at least 2,000 years. At the poles, sea-ice loss is extreme and accelerating.



3X

The pace of sea-level rise has roughly tripled, in comparison with rates from 1901 to 1971.

IS IT TOO LATE? THE SHORT ANSWER IS NO

The IPCC report said, accurately, that if we reached zero emissions today, temperatures would still continue to rise until about 2050. That's called committed warming. Put simply, a certain amount of future global warming is now a given, since the cycle for that warming has already been set in motion.

The reason many climate activists were upset with that statement was that it makes the situation sound hopeless, when taken out of context. The truth is, it has never been more vital for everyone to participate.

The solution lies in the idea of net-zero emissions, where emissions caused by human activity are slashed, and also counterbalanced through the use of natural and artificial carbon sinks, and by cutting waste and consumption.

Realistically, net-zero emissions could be possible between 2035 and 2070, for different countries. Technology is evolving, more individuals, companies and governments are aware and participating. The more emissions we cut today, the further we stay from the danger mark of 2 degrees Celsius over pre-industrial levels, and the closer we can get to net-zero emissions.

Here's what you can do:

Take the train instead of the plane, use public transport when you can

Switch from fossil fuels to renewable sources and electric vehicles

Cut as much plastic out of your life as you can



Reduce waste. Recycle. As vital, don't discard. Every object you buy takes water and power to make, raises its carbon footprint further when it's packed and shipped. Reuse everything you can. For as long as you can.

IF WE CHOOSE NOT TO ACT

If we choose not to act, the extremes will get worse. Rising temperatures on land and in the oceans will result in intensified drought, greater tropical storms, more wet and dry extremes in the global monsoon.

As the rates of loss of polar sea ice and permafrost rise, this will heighten the pace of the warming and disrupt ocean ecosystems.

There will be repercussions for farming and food production, for cities, economies, homes and businesses. For you.

Global warning: This is it (and every bit counts)

Wknd spoke to 7 climate scientists from around the world. Ahead of COP 26, what are their fears, what keeps them going, where do they find hope? Their message: There is still a lot to save. Do what you can. Do it now

Vanessa Viegas
letters@hindustantimes.com

A week from now, on October 31, world leaders will gather in Glasgow, Scotland, for COP26, the 26th United Nations Climate Change Conference of the Parties. Don't tune out. This concerns you. And your children.

At that meeting, world leaders will try to reach an agreement on a concept they're calling net-zero emissions. On a planet that is already 1.1 degrees Celsius warmer than it was in 1850, with all the climate chaos that has unleashed, net-zero emissions holds out promise for a way out, a way forward.

Net-zero emissions is the idea that humans can counter-balance emissions through the use of natural and artificial carbon sinks. If we can do this while ensuring that average global warming stays under the 2 degree Celsius mark (when compared with those pre-industrial levels from 1850), then there is significant hope that the damage we have caused can be contained.

This will involve change, at the personal and policy levels. New technologies will need to be deployed and widely adopted. Across the board, fossil fuel use will have to drop, renewable energy use will need to rise, and consumption patterns change. The developed world will have to own up responsibility for their legacy of contributing much of today's atmospheric carbon, put their money where their mouth is and finance emission- and carbon-control initiatives in the developing world, and not insist on one deadline for net-zero (the surest way to kill the talks). For their part, developing countries such as India should be willing to sign off on commitments on when their emissions will peak,

when they will hit net-zero, and how they plan to reduce the emission intensity of their GDP. All this is in the realm of possibility. The next decade will be crucial in setting this ball rolling. Twenty years from now, if the world isn't close to net-zero emissions, the result will be a climate crisis that intensifies exponentially.

Use less power, less petrol, take fewer flights, switch to electric vehicles; avoid plastic; reuse everything for as long as you can. Because this is it, and every bit will count. That's the message from climate scientists around the world, India, the US, the UK, Asia, Scandinavia, who Wknd spoke to in the run-up to this crucial meet next week.

It's been a tough few decades, they say, watching the climate emergency intensify and calls to action go unheard by individuals, industries, communities and countries. "The biggest problem isn't that people don't think climate change is real. It's that most still think it's a few decades away," says NH Ravindranath, a retired professor with the Centre for Sustainable Technologies at the Indian Institute of Science, and co-author of assessment reports by the Intergovernmental Panel on Climate Change (IPCC).

To the dismay of the scientists Wknd spoke to, this was true around the world: some people think the danger is still years away; tragically, others think there's nothing to be done. "But we can fix this," says Piers Forster, a professor of physical climate change and director of the Priestley International Centre for Climate at the University of Leeds, UK. We must fight hard and keep fighting, adds NASA scientist Peter Kalmus, "no matter how bad it gets, because we've lost a lot, but there's still a lot to save."

Read on for more on what these years have felt like, what keeps client scientists up at night, where they find hope, and what they fear most.

ANNE SOPHIE DALOZ | CICERO CENTER FOR INTERNATIONAL CLIMATE RESEARCH, NORWAY

'The climate crisis is a chance for us to reimagine society, tackle inequalities'

Climate modeller at the CICERO Center for International Climate Research in Oslo, Norway, Anne Sophie Daloz has studied a range of climate crisis-related themes, including the effects of climate change on tropical cyclones, snowfall and clouds, and farmer perceptions of climate change in the Himalayas.



"At this point, we should have initiated more collaborations between sectors, countries, political parties and basically everyone. The climate crisis is a chance to reimagine society. I believe in climate solutions that have multiple co-benefits, including decreasing social inequalities."

On the upside, she doesn't feel like this field is ignored anymore. "The impacts of climate change are visible everywhere. Take the heatwave in Canada this summer. The last reports of the IPCC have been widely communicated to different

audiences. I can see that more people from very different backgrounds realise that climate change is a critical issue and that we need to do something about it now." Hope keeps her going, but some days are harder than others, she admits. "I get frustrated by high-ranking lobbyists and politicians, who know climate change is real, man-made and urgently needs to be handled, but choose to reject it openly. In exchange, the electorate will demand the denial of climate change. The deception feeds on itself, with grave and worldwide implications. At the same time, I am often hopeful because I see many people doing fantastic things, creating new associations, having new great ideas that contribute to solving the climate crisis."

SURUCHI BHADWAL | THE ENERGY AND RESOURCES INSTITUTE, DELHI

'Nature will not wait for us to settle our differences'

In terms of where we are headed, I get very concerned," says Suruchi Bhadwal.

Bhadwal is director and senior fellow of the Earth Science and Climate Change division at Delhi-based The Energy and Resources Institute (TERI). She directs science and policy research on climate change, focusing on impacts, vulnerability and adaptation studies.

"I'm scared as an individual, but I'm concerned for the earth as a whole, because no

matter what countries do and what they pledge, the impacts will be felt by all of us," she says.

The bush fires in Australia, the forest fires in Siberia, the floods, the storms, the deluges and floods in India. "These are all signals to tell us things are not going right, and we are still not acknowledging it." Cutting emissions has to be a unanimous choice globally or it cannot work, she adds. "If, as humans, we don't think that saving the human race is an area that deserves



attention, then I'm very concerned. At the end of the day, the natural ecosystem will not wait for us to settle our differences."

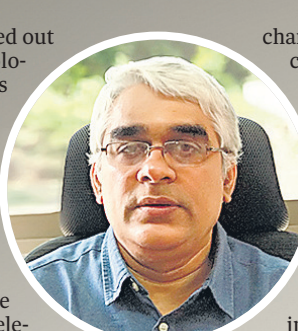
At the individual level, Bhadwal adds, households could be less consumptive. Simple things such as saving electricity and carpooling are crucial. "After all, this is not an issue that should bother only scientists and governments. It's an issue for everyone out there," Bhadwal says. Politicians and governments around the

world need to be far more aggressive in their approaches. "We are looking at tipping points for many areas, we are looking at thresholds being crossed, and there is still a disconnect between what the science is asking us to do and what politicians and governments are doing. As a scientist, her job, as she sees it, is to never lose hope and to keep repeating the message over and over, in the hope that it will be heard. On the upside, improved assessments and predictive models are evolving. But given how countries are still not in agreement about reductions in emission levels, she says, "I don't see us as a species doing much in this regard over the next few decades."

KRISHNAN RAGHAVAN | INDIAN INSTITUTE OF TROPICAL METEOROLOGY, PUNE

'I could not have imagined we'd be here'

When he started out as a meteorologist 30 years ago, "I could not have imagined the types of repercussions that we are witnessing now," says Krishnan Raghavan, 56. "I recall seeing Syukuro Manabe, the Japanese-American climatologist who won the Nobel Prize this year, on television in the late 1980s. He had been making some major projections about global warming since the 1960s. Watching him talk about the global climate response to rising carbon-dioxide levels in the atmosphere was all exciting to me as a newcomer to the scientific profession, but it was more out of scientific curiosity. I couldn't have imagined this scale of



changes in extreme weather and climate events." Raghavan is now executive director of the Centre for Climate Change Research at the Indian Institute of Tropical Meteorology, Pune. He is very concerned. "In terms of heatwaves, heavy precipitation and droughts, the extremes are intensifying. One of my main concerns is that tropical cyclones and flood-producing precipitation systems are becoming more powerful. Additionally, with rising sea levels, our coastal areas are becoming increasingly vulnerable."

Civil society and individuals are more aware these days, he adds. But it troubles him that the communication gap is still so

PETER KALMUS | NASA, USA

'I'm terrified right now'

Being a climate scientist is strange, because how can you quietly pursue science when the planet you love, and the world your children will inherit, is collapsing before your eyes, asks Peter Kalmus, 47, who works at NASA's Jet Propulsion Laboratory in California. "I feel an intense mix of sadness, frustration and rage. I'm terrified right now. After all the things we've tried, to wake people up, I'm at a loss as to what to do."

Kalmus says he is deeply concerned that humanity will remain on its current path of inaction, with world leaders unwilling to rein in the fossil fuel industry and reduce global emissions. And he's concerned that people around the world don't grasp the depth and breadth of what's coming, and how soon.

The climate crisis prompted Kalmus to switch careers from astrophysics to climate science, in 2012, which is when he joined NASA JPL. "I started thinking about climate pretty much all the time, so eventually I just switched," he says.

Kalmus is also a climate activist. "I spend a lot of time, energy and thought trying to wake people up to a sense of deep urgency. I think we need a billion or more climate activists around the world to create a fierce demand for policies that lead to rapidly ending the fossil fuel industry."

He founded the Climate Ad Project, a non-profit organisation that creates short videos that inform and encourage people to become climate activists. He wrote a book, Being the Change (2017), on his journey to a slashed carbon footprint. "I have two children, aged 13 and 15, and my younger is a regular climate striker," Kalmus says.

But people are not acting quickly enough. "Unfortunately, the way we're wired, it

appears that most people need to experience the catastrophes in the present moment to know they are real. The great tragedy of being a climate scientist is seeing the future — a catastrophically hotter planet — but not knowing how to get people to act.



appears that most people need to experience the catastrophes in the present moment to know they are real. The great tragedy of being a climate scientist is seeing the future — a catastrophically hotter planet — but not knowing how to get people to act until that future becomes the present. That's why society is just now starting to act, even though the science has been clear for fifty years."

Kalmus says he wishes the scientific community had recognised early on that in the struggle over information and public opinion, "we were up against a wealthy, powerful and immoral adversary: the fossil fuel industry." "You can't just talk about climate emergency in peer-reviewed literature, in dry scientific language. You also have to warn society in a way that gets through. You have a responsibility to do so."

His message to anybody who cares to listen: "Fight hard and keep fighting, no matter how bad it gets. It's not a case of all or nothing. We've already lost a lot, but Earth is incredibly beautiful and bountiful and there's a lot still to save."

(Views expressed are his own)

NH RAVINDRANATH | CO-AUTHOR OF IPCC REPORTS, BENGALURU

'Every year's delay now will cost us'

One of the drawbacks of being a climate scientist is that one never has results to offer right away, says NH Ravindranath, 69. The second big drawback is that, as you watch what you predicted occur, you know it is essentially irreversible: Sea level rise, damage to biodiversity due to forest fires, snowmelt at the Poles will take thousands of years to undo.

"But there is much we can do," Ravindranath adds. "In agriculture, we can still change crop varieties and come up with good management practices to cope with changing climate. We can work to protect forests and biodiversity before it is too late."

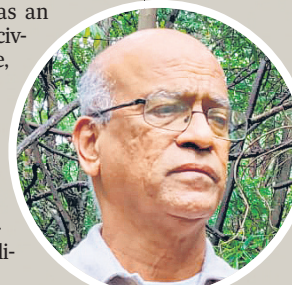
Since the 1990s, Ravindranath, who is based in Bengaluru, has researched climate change impact, mitigation measures, vulnerability in forest and agro-ecosystems, adaptation and climate resilience, among others. He was also a professor at the Indian Institute of Science's Centre for Sustainable Technologies, and he had co-authored co-author assessment reports of the Intergovernmental Panel on Climate Change (IPCC).

When he started out, he says, few people were concerned about the issue. That's changed. "It is now such an enormous developmental concern. It has an impact on every area of human civilisation," he says. For the future, Ravindranath says he is cautiously optimistic. "I can't call it doomsday just yet. We live on the hope that even now the world community can come to an agreement on how and how fast we can reduce carbon dioxide emissions and adapt to the climate impacts," he says.

Science has shown that emission level goals are a challenge, but achievable. "It requires a huge political commitment, a lot of institutional and structural changes. We need to transform our society. Transform transportation, transform energy, transform housing, transform agriculture. That's the scale that's required. Which is why I say I am cautiously optimistic."

But as a father and a grandfather, he feels a deep-seated fear, he adds. "In the last two years, we've had the worst forest fires, the worst heat stress. I worry about what awaits me in my lifetime. I fear for my own grandson or my six-month-old grandson. I'm terrified for his future for sure."

It's alarming to him that, in countries around the world, the climate crisis is not a serious enough issue at the government level, city level, village level, household level. People seem to think that this is a crisis that is decades away, Ravindranath adds. "But we are already starting to see the impact. Every year's delay now will cost us enormously in the long run. Delay is a villain. That is my biggest worry. We have to act now and we have to act fast."



WATCH Peter Kalmus and Anne Sophie Daloz talk about the urgency, the hope, and the need to start now

LYNETTE CHEAH | SINGAPORE UNIVERSITY OF TECHNOLOGY AND DESIGN, SINGAPORE

'Decisions we make now can have a positive impact'

Lynette Cheah, 43, is hopeful. Collective hope may go a long way, says the associate professor of engineering systems at the Singapore University of Technology and Design. Cheah is also director of the research group Sustainable Urban Mobility, which creates data-driven models to reduce the environmental impacts of passenger and freight transportation.

She enjoys working in this field, she says, because it allows her to build momentum from awareness to action.

The widespread human response of denial and dismissal of climate change does concern her, and deeply, she adds. "Some people may hear 'crisis' or 'emergency' and associate the message with doom and gloom. This can create anxiety, despair, inaction. Individuals and communities coming together, acknowledging concerns, focusing on realistic solutions, and collaboratively considering how to adapt is a more effective approach."

There are several clear reasons, in her opinion, why people are more driven to denial than action. The consequences of climate change are not uniformly distributed, so not everyone sees them. "Others notice structural issues, such as our profound reliance on fossil fuels, or the scope

I witness the inventiveness that scientists, researchers, inventors and students bring to the challenge. It helps me stay optimistic.

Cheah says she wishes that the messaging surrounding climate change in the past had focused a bit less on the gravity of the problem and been more hopeful. The truth, she adds, is more reassuring than most people think: decisions we make now can have a long-term positive impact on our community.

How does she stay hopeful? Cheah says she relies on fellow climate scientists and educators for encouragement. "I witness the inventiveness and energy that scientists, researchers, inventors and students bring to the challenge," she adds. "I am optimistic that more action will be taken in the future."



PIERS FORSTER | UNIVERSITY OF LEEDS, UK

'We have solutions in play. But we need to go faster'

Piers Forster likens climate change to being on a train with a bridge out somewhere along the track. He's not sure how far away the plummet is. "If we don't put on the brakes now, the train might fall into the chasm," he says.

Forster, 53, is a physicist and professor of physical climate change at University of Leeds, UK. He is also director of the Priestley International Centre for Climate, and co-founder of the United Bank of Carbon, a forest protection and research charity.

He was also a coordinating lead author on the sixth assessment report of the Intergovernmental Panel on Climate Change (IPCC), released this August. Forster has been a teacher for more than two decades. His class is twice as large as in previous years, and he notices that young people are concerned about the real dangers of climate change. They understand how difficult it is to change societies by democratic means.

He attempts to instill in them a sense of hope that a better future is on the horizon. "I try to give them the tools they need to go out and play important roles in repairing our world," he says. "I never fail to be inspired by their enthusiasm and passion."

His biggest fear is that people might not realise the urgency of climate change until it's too late. "But I'm an optimist," he says. "We have the solutions. They are beginning to be deployed, but we need to go faster. Our climate, our air quality and our health depends on success."

He believes one of the biggest obstacles

The hope is that, 20 years from now, things will look very different, in a good way. By then, we could be getting net emissions close to zero.

is communication. The gap between what scientists say and what the public hears about climate change has been a major source of frustration to him. He wishes, he says, that in decades past they had done a better job of talking about what they understood rather than what they didn't. Even if they had, he admits, it would have taken a lot to reverse global reliance on burning fossil fuels.

The hope is that, 20 years from now, things will look very different, in a good way. "By then, we could be beginning to stabilise temperatures by getting net emissions close to zero." If not, the climate crisis will have intensified, there will be worse flooding and heatwaves and more people dying.

It's heartening to him that his 18-year-old daughter, Harriet Forster wrote her first climate research paper in 2020. Across his own sphere of influence, he talks to people about the things he's doing to reduce his carbon footprint. In ways that "make being green seem as normal and as easy as possible."

A zero-emissions world would be a better world in so many ways, Forster says. "It would be healthier, safer, more equitable, with a better future for our children. We adults need to get out of their way so they can create this better world."

