

2022 was a historic year for climate change policies. What's next for 2023?

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2022 was a landmark year for climate change action—and repercussions.

President Biden signed the historic Inflation Reduction Act to boost [clean energy](#) and reduce [greenhouse gas emissions](#) in the midst of the hottest August on record for North America and Europe.

Following a summer of historic flooding that put one-third of Pakistan under water, the United Nations Climate Change Conference COP27 in November recommitted to the goals set by the 2015 Paris Climate Agreement and agreed to help countries most vulnerable to [climate change](#).

Also in November, U.N. officials met in Uruguay to discuss terms for a treaty to end plastics pollution by 2040, and in December COP15 participants meeting in Montreal adopted a framework to address biodiversity loss, protect indigenous rights and restore the ecosystem.

Whether these actions will be enough to help put the brakes on [global warming](#) and keep rising temperatures to less than 2 degrees Celsius—preferably, to 1.5 degrees as stated in the Paris Climate Agreement—depends on steps taken in 2023, experts at Northeastern say.

News@Northeastern spoke to associate law school professor Alexandra Meise, engineering professor Auroop Ganguly and public policy professor Maria Ivanova—experts in energy use, climate adaptation and resilience and plastics pollution diplomacy, respectively—about what needs to happen in the next 12 months to meet climate change challenges.

Alexandra Meise

"If I had to pick one event or point of progress to look at in 2022, that would be the Inflation Reduction Act and the \$369 billion in climate change-related investments that are going to stem from that," says

Alexandra Meise, associate teaching professor at Northeastern University School of Law.

She called the legislation "transformative" in the way it will enable the U.S. to meet its emission reduction targets and transition "from the use of fossil fuels into greener technologies for power generation and transportation."

It's crucial that the U.S. and other countries pick up the pace to meet the goal of preventing temperatures from rising more than 1.5 or 2 degrees Celsius above pre-industrial levels, Meise says.

"We've heard a lot of talk. Now we have to see what the action is," she says.

Parties to the Paris accords have been making progress, Meise says. But "they haven't been making progress fast enough on reducing emissions to hit needed targets."

Progress of course depends on the continued cooperation of politicians across the globe.

In the U.S., Meise says she hopes the Republican-controlled House of Representatives will see the benefits of supporting improvements to the infrastructure and green energy.

The U.S. is increasingly seeing the impact of changing climate in terms of intensified storms and heat waves, flooding and droughts.

"That's really bringing climate change home to individuals in a way that they may not have thought about before," Meise says.

"This is a security threat that's right at your front door because your

front door is flooded or your power has gone out."

In Europe, the Russia-Ukraine war poses a major risk to emissions reductions as European nations debate whether to fire up coal plants in lieu of Russian oil and natural gas shipments.

"It certainly is an issue," Meise says, adding that the situation raises concerns about how countries will be able to meet their green energy goals while still keeping the lights on.

Auroop Ganguly

COP27 made progress in recognizing the role that industrialized, [high-income countries](#) that generate the most emissions must play to mitigate the impact of climate change in lower income countries suffering the brunt of the effects of global warming, says Auroop Ganguly, professor of civil and environmental engineering.

Creating a specific fund for loss and damage was progress, says Ganguly, who is also director of Northeastern's Sustainability and Data Sciences Laboratory.

"We still need to see to what extent each country follows up with promises that have been made," he says.

Progress also is being made on municipal and state levels, with Boston Mayor Michelle Wu appointing Kate England green infrastructure director and Massachusetts Gov. Maura Healey tapping Melissa Hoffer to serve as the state's first climate chief.

Massachusetts, Oregon, California and Washington have led the nation in "terms of clean tech and climate policies," Ganguly says.

Where much work remains to be done is in getting scientists representing different fields and social scientists to break out of academic "silos" and work together on risk assessment and adaptation, he says.

To understand the impact of drought, it's important to know how much to what extent human usage is tapping water supplies, for instance, Ganguly says.

Indonesia is moving its capital city from Jakarta, which is sinking due to climate conditions and the withdrawal of [water supplies](#) for human usage, he says.

"There is not enough understanding, not enough cross pollination, between even adaptation scientists and structural engineers, who should be working very closely," Ganguly says. "Everybody needs to take part in both adaptation and mitigation."

Ganguly says a New York Times article a few years ago pointed out that [climate](#) change isn't a cliff "you fall over but the chasm which you continuously descend."

Maria Ivanova

The same petroleum industry that produces fossil fuels also manufactures plastic.

And plastics have become a health burden for the planet and individual biological beings, says Maria Ivanova, Northeastern professor of public policy and director of the School of Public Policy and Urban Affairs.

"We now have microplastics in human blood, in human placenta," she says.

"Animals of all sizes are killed by plastic pollution, from nets to bags to other debris. It affects planetary health because it pollutes rivers, pollutes the land. It's manifesting locally, but ultimately the impacts are of planetary proportions."

Ivanova was a delegate of the International Science Council to negotiations on a U.N. treaty to end plastic pollution by 2040.

With the treaty slated to be adopted in 2024, there will be much work to be done in the coming year.

Ideas being discussed for treaty aims include potentially banning some types of plastic outright—including Styrofoam and polyvinyl chloride—while promoting the use of bioengineered products that act like plastic but degrade naturally.

"We should ultimately have as little plastic to recycle as possible," Ivanova says.

Research universities such as Northeastern have a significant role to play by convening conversations, enabling innovation and ensuring the "open source" development of any new polymers, she says.

"Open source" means everybody can see the composition of a material. Currently, the current model that rewards patenting unique proprietary materials has resulted in a myriad of products that require different recycling methods, if they can be recycled at all, says Ivanova, who will travel to Paris in May for further treaty deliberations.

When plastic is necessary for medical supplies and food production, there needs to be a plan in place for the end of its life cycle, she says.

"Plastic is ultimately a petroleum product. The [petroleum industry](#) has a

vested interest in more plastic," Ivanova says.

"We need to change that limited mindset. What kinds of alternatives we present is indeed a space where engineers need a much stronger, much more forceful presence. And that's where I think higher education has a role to play."

Provided by Northeastern University

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