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THE DRASTIC STEPS IRVINE, CALIFORNIA, TOOK TO REDUCE OZONE-DEPLETING CHEMICALS

The small city set a new national precedent in the fight against chlorofluorocarbons, or CFCs, which caused major danger to the atmosphere.

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In July of 1989, a small city in Orange County, California, took a bold step. Barely 20 years old and with a population of just over 100,000, Irvine decided to jumpstart the municipal effort to save Earth from a giant hole ripping through the atmosphere.

In a four to one vote, Irvine's city council approved a measure that would phase out the use of chlorofluorocarbons, or CFCs, in nearly all industrial processes and consumer products. CFCs are major ozone-depleting chemicals that were used in everyday household products, from refrigerators and air-conditioning systems to hair sprays and food packaging. Among other things, Irvine's ordinance barred the use of CFCs in manufacturing, production, cleansing, degreasing, or sterilization processes, and prohibited the use of CFC-laden packaging. Building insulation also had to be free of CFCs, and air conditioning and refrigeration repairing firms were required to capture the compound for recycling.

The move made national headlines. The *New York Times* called the ordinance "the most far-reaching measure" to protect the ozone, and the *Los Angeles Times* declared it "the most comprehensive law in the nation" against CFCs. Critics called it bad for business.

Then-mayor Larry Agran, who championed the move, estimated that it would affect about 500 of the city's 5,000 businesses, and that the reduction of CFC emissions in the city would fall between 20 and 50 percent. But even if Irvine were to eliminate all of its CFC emissions, it would only account for 1.5 million pounds a year—less than 1 percent of the world's production of CFCs.

Why go to all that trouble for a drop in the bucket?

Irvine was after something bigger. "We are very eager to prod our national government and international bodies to act much more quickly in the face of this global emergency," Agran told the

New York Times in 1989. "Local communities acting two to five years in advance of states and nations is how change takes place."

TAKING CHARGE

Two years earlier, two dozen countries, including the United States, had committed to the Montreal Protocol, which aimed to reduce CFCs to protect the Earth's ozone layer. Today, all 197 United Nations member states have signed on, and current research credits the agreement for shrinking the hole.

The latest assessment, released Monday by the U.N. and organizations like the National Oceanic and Atmospheric Administration and the World Meteorological Organization, reveal that through the collective effort, the ozone layer in different parts of the stratosphere are on a path to full recovery, healing at a rate of 1 to 3 percent per decade. By 2030, researchers expect the layer in the Northern Hemisphere to fully recover, followed by the Southern Hemisphere in the 2050s, and the polar regions by 2060.

Back when the protocol went into effect in 1989, though, only a handful of governments had begun to pass legislation banning CFCs, and only in certain products. Portland, Oregon; Tempe, Arizona; and California cities like Berkeley and San Francisco had banned Styrofoam packaging that contained CFCs. Vermont became the first state to ban the chemicals in car air conditioning, which was the single largest U.S. contribution to ozone depletion. Meanwhile, the Environmental Protection Agency had banned the compound in aerosols.

"Other municipalities were doing things that were truly symbolic," Agran told CityLab. "But what if we did something that was a little bit more comprehensive, to get the ball rolling? What if we measured just how much we are contributing to the problem and figured out how to advance the solution?"

With that, Irvine took a more drastic step in hopes that other cities would follow suit. The city was home to several high-tech industries, from computer hardware and software to biotechnology and medical devices. Not surprisingly, business owners opposed the ordinance, warning the city council that complying with the law would either make services and goods costlier for consumers or drive business out of Irvine. Agran and his team disagreed.

"The ordinance wasn't going to be successful if it drove companies to shut down a particular production line or make their products more expensive," said Michael S. Brown, a former regulatory analyst at the EPA, whom the city specially hired to oversee the implementation. The key, rather, was to help businesses gradually transition over to CFC alternatives. That means pairing "technical assistance with a deadline and an exemption process that companies could apply for," he said. Exempted companies would have to show they were actively working on a plan to eliminate the chemicals from production.

To that end, the government formed a Science Advisory Committee with engineers and business experts. The panel researched substitutes and considered alternative administrative approaches, as well as review exemption applications. They also reached out to businesses as part of the city's plan to prioritize education, and held workshops for local owners.

Data from individual companies was limited, but, in a 1992 report in the *Journal of the Air and Waste Management Association*, Brown and then-city manager Allison Hart said the ordinance was effective in spurring action even before it was fully implemented. In anticipation of the vote, they wrote, managers began looking into alternatives and companies were trying out new, cleaner technology in their production process. For those who couldn't immediately eliminate the use of CFCs, they were committed to at least reducing it. "It was really all about getting compliance without getting out the hammer," Hart told CityLab.

In a way, the trajectory of the industry was on Irvine's side. In fact, a 1990 *Los Angeles Times* article reported that there were so many "loopholes" in the ordinance, particularly among its exemption rule, that it didn't make any major changes to how businesses operated.

Even companies that were exempt from the ordinance, namely defense contractors and those that manufactured Food and Drug Administration-regulated products, had already been pivoting away from CFCs. Orange County's top emitter, the medical device manufacturer Bentley Laboratories, reported that it had reduced its emission from 89,000 pounds in 1987 to 50,000 by 1990. The company's spokesperson told the *Times* at the time that the move was mostly motivated by rising cost of CFCs. "We've had an aggressive corporate policy of reducing CFC emissions," he said. "It's not directly related to Irvine. It would have happened anyway."

That led critics to call the ordinance quixotic and an overreach of city power. Agran argued then (and still does today) that it's responsible for speeding up progress—and not just in Irvine. "You can wait around until industries decide to do it, you can ask people to do it voluntarily, or you can give it a big push," he said. "Come on, that's what the governments are for, to lead us in the right direction."

THE GLOBAL STRATEGY

While eyes were on the federal government to turn the Montreal Protocol into action in the U.S., Argan brought together 24 cities from across the country for a two-day conference the same week his city passed its ordinance. The agenda: To figure out how cities can collectively make up for the slow progress at the national and international level.

That Irvine led the charge is no coincidence. The predominantly Republican community broadly supported environmentally friendly policies regarding land use and open space preservation. It was among the early adopters of curbside recycling and it was home to the University of California–Irvine —where two scientists spearheaded the research about the dangers of CFCs.

"It was logical for them to be among the first to get involved," said Mario Molina, who leads the Mario Molina Center for Strategic Studies on Energy and the Environment in Mexico City. "The city was a way to get started, to let society at large know that this was relevant." He was one of those scientists. It was in 1974 that he and F. Sherwood Rowland published a paper in the journal *Nature* with a damning theory that CFC molecules, known for their inert properties, get broken up by UV radiation when they drift into the stratosphere. The process releases chlorine, which thins out the ozone layer. (A decade later, British scientists would back these calculations with the detection of an ozone hole above Antartica.)

By the '70s, some 20 million metric tons had already been released. The chemists (and eventual

Nobel Prize laureates) led a steadfast campaign urging U.S. policymakers to ban CFCs, going head-on with what was on track to becoming a $28 billion industry—one with the means to discount their theory as "utter nonsense." As the science became clearer, they realized they needed a much larger audience. "We were talking about something without precedent," Molina recalled. "A global problem [in which] it doesn't matter where you release this compound because it affects the global atmosphere."

At the time, the movement of uniting cities on foreign policy issues was just beginning to take off. "It really all got started in the early '80s with a nuclear-free zone campaign and the nuclear weapons freeze, and then Jobs With Peace [campaigns]—all of these efforts that focused on having people do referendums at the local level on foreign policy issues," said Jeb Brugmann, who by the mid-'80s had formed a network of 630 U.S. mayors and city council members called the Local Elected Officials for Social Responsibility (now known as ICLEI). Agran himself was also involved through his think tank, the Center for Innovative Diplomacy, and the two soon merged their organizations.

It was Brugmann, an environmentalist at heart, who pitched the idea of focusing their collaborative efforts on a global environmental issue—and for Agran, who personally knew Rowland, it made perfect sense. At the two-day conference in Irvine, city leaders adopted a resolution calling for a complete ban on CFCs by 1992. In the following years cities introduced their own measures, as reported by the EPA in 1990:

> **Since that time action has been taken in other municipalities, the city of Newark, New Jersey, passed its own comprehensive ban on CFCs on October 4, 1990. Austin, Texas, is developing an ordinance similar to these first two. Colorado local legislators are seeking a regional approach to CFC banning laws. Cambridge, Massachusetts, developed a comprehensive ordinance that targets businesses and universities in that city.**
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> **Other municipalities have selected portions of the ozone depleting chemicals issue for immediate local action. Minneapolis, Topeka, and Berkeley are recycling coolant from old appliances. San Jose, Albuquerque, and Berkeley will regulate auto air conditioner emissions by requiring recycling equipment at repair shops.**

California State Senator Nancy Skinner—then a councilwoman in Berkeley and the cofounder of ICLEI—took the cities' momentum, and pressured states and even federal governments to get their respective legislation passed. And by 1992, with support from the White House under President George H.W. Bush, the U.S. Senate unanimously passed a proposal to halt the production of CFCs as fast as possible. (It certainly helped that the company DuPont, which led the CFC industry and lobbied hard on its behalf, finally accepted the science and backed the Montreal Protocol in 1988 as part of its corporate strategy.)

Meanwhile, Brugmann was taking the intercity effort global. Later that year, he brought their cause to the World Conference of Mayors for Inter-City Solidarity in Hiroshima, Japan, and eventually to the U.N. "The whole point was to get it started in the U.S. and then roll it out internationally," he said, "taking this notion of cities kind of pledging—almost like there was an intercity treaty—to regulate this substance."

LEARNING FROM THE PAST

If there was one advantage that activists then had over today's climate advocates, it's that saving the planet hadn't become a polarizing issue, at least not to the extent it is today. "We were lucky that the ozone depletion story didn't become politicized," Molina said. "That's what happened with climate change."

Case in point: Irvine in 1989 was a conservative enclave. Just months before the CFC vote, the city council faced mounting pressure to remove the words "sexual orientation" from an anti-discrimination measure. Still, the affluent Republicans that made up the majority of the population tended to side with green advocates on environmental issues that hit close to home. And they swore in a Democratic mayor and a mostly liberal city council to see that the jobs got done.

Still, there are enough similarities between the environmental challenges then and now: the industry-led skeptics, the reluctance of federal government, and the collective willpower of local policymakers to take action in hopes of spurring action on the national, even international level. One key, Molina said, is to get creative. "The main challenge was, well, maybe this will hurt the economy," he said. "But we showed with the ozone layer that if you do it properly, with creativity and new technologies, the economy can thrive and do even better."

The other lesson, perhaps directed at climate skeptics, is to listen to science. "Science doesn't tell society what to do," he said. "It can only tell us what happens if [people] continue doing certain things.

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