Climate Solutions

What it takes to be carbon neutral — for a family, a city, a country

Copenhagen officials estimate that 75 percent of all trips must be done by bike, foot or public transportation to meet their 2025 goals. (Ulf Svane/For The Washington Post)

By Michael Birnbaum

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On my list

COPENHAGEN — Louise Purup Nohr's morning routine is like something out of a sustainable future.

When she hustles her kids into the bathroom, what flushes down the toilet will later turn into the natural gas that warms breakfast on the stove. The eggs come from the chickens in the backyard. The coffee machine's gurgling is powered by electricity generated from the wind. The water that washes the dishes is heated by sustainable sawdust pellets. The recycling gets shunted in eight directions, so that little ends up in the dump. And the commute — first to school, then to work — is on a cargo bike that bumps across Copenhagen's extensive bike-lane network.

Amid mounting global concern about climate change, Denmark has turned into a buzzing hive of green experimentation, with efforts underway inside homes, across cities and on a national scale.

Households such as Purup Nohr's are seeking to limit their carbon footprints by cutting back on consumption.

Copenhagen is trying to become the first carbon-neutral capital by 2025 -- a full 25 years before Washington and other major world cities expect they might have a shot at canceling their emissions.

Denmark's newly elected center-left leaders are trying to turn the whole country into a showcase for how to go green without going bankrupt.

[Climate Solutions: Stories on the people and organizations tackling environmental challenges]

Danes hope they will inspire others to follow suit, creating an impact that goes beyond the borders of this country of 5.8 million people. The societal effort is also a measure of just how much needs to change to slow climate change.

TOP: Louise Purup Nohr feeds the chickens in her backyard in Copenhagen. (Ulf Svane/For The Washington Post) BOTTOM LEFT: Purup Nohr uses secondhand cloth diapers in an effort to consume less. (Ulf Svane/For The Washington Post) BOTTOM RIGHT: Purup Nohr and her daughter, Frida, sort waste at their home. (Ulf Svane/For The Washington Post)

A household that aims to 'live small'

For Purup Nohr's family, being environmentally conscious has involved conscious trade-offs.

"We're not minimalists," said Purup Nohr, 31. But she and her husband have examined every aspect of their lives for its environmental impact.

"It is a journey," she said. "You start looking, and then you look at your food, and then you look at your transport. When you start thinking about the environment, you want to make your life fit."

Some of their adjustments have been relatively minor. They phased out liquid shampoo in favor of soap bars that don't require bottles, and hung an hourglass into the shower to keep themselves from dawdling under the water. They bought used reusable cloth diapers — which they plan to resell to someone else when they are done with them. The little red cart their 1-year-old uses to toddle around is secondhand, as are the rest of the toys, so as not to fuel more production and consumption.

Lau Purup Nohr picks apples with his family. (Ulf Svane/For The Washington Post)

But the family has also made more significant lifestyle decisions with climate and the environment in mind. Purup Nohr, her husband and two small children don't travel on planes — they've committed to exploring Denmark's many islands during their vacations for years to come. She works part-time, reasoning that earning less, spending less and consuming less all go together. And they've contented themselves with a small apartment in town, instead of something like the more spacious suburban houses they grew up in.

[Europe's flight-shame movement has travelers taking trains to save the planet]

The family isn't radical by Danish standards. They haven't cut meat from their diet, for instance, though they've reduced it. They rent cars from time to time, and they try not to be doctrinaire about their efforts.

Danes have long tilted toward green-friendly action, especially in Copenhagen, a city of 624,000 with a rich countercultural tradition.

Nearly half of Danes — 47 percent — consider climate change to be the most serious problem facing the world, according to European Union polling. That's more than double the E.U. average of 23 percent.

And yet researchers from the Norwegian University of Science and Technology pegged the annual carbon emissions of the average Dane at 14.5 tons, above the E.U. average and reflective of the country's wealth.

Many scientists say a two-tons-per-person annual limit will be needed to meet the 2050 goals of the Paris climate accords.

Frida plays with secondhand toys. (Ulf Svane/For The Washington Post)

"People are always saying that Denmark is doing so much," said Mathilde Vallat, 16. "We're still polluting like hell."

Vallat is among the Danish students who have joined the Fridays for Future movement. Inspired by the example of 16-year-old Greta Thunberg, who comes from neighboring Sweden, thousands of high schoolers have marched through the cobbled streets of Copenhagen, decrying their parents' generation for not doing enough.

['We will make them hear us': Millions of youths around the world strike for action]

The deliberate choice to "live small," Purup Nohr said, is one way people can be kinder to the planet than their parents might have been.

She and her husband, she said, "live in a world where our parents live in big houses with a lot of money and we don't. We have no debt. We have no savings. It's a choice. We could also have chosen to have different jobs with more money. I think we live the good life."

She acknowledged that climate issues can feel overwhelming.

"I don't read articles about the ice melting or the biodiversity crisis," she said. "We never talk about climate with the children. I think it's way too scary."

Instead, she focuses on things within her control, while asking herself: "Do you want to give a better world to your children, or a catastrophe?"

Copenhill is an artificial ski slope built on top of a power plant that burns trash.

Becoming the first carbon-neutral capital

Having a motivated population, with families like Purup Nohr's, has enabled Copenhagen to set one of the world's most ambitious climate goals.

The dash to become carbon neutral within the next six years has sent city planners scouting across the Baltics for sustainable sawdust, turned what were once traffic-choked roundabouts into tree-studded miniature wildernesses, and led to the construction of an urban ski slope atop a hulking new power plant that burns trash to make electricity.

"Livability and the green transformation go hand-in-hand," said Copenhagen Mayor Frank Jensen, who helped establish the climate goals soon after taking office in 2010.

[Scientists are weighing radical steps in a desperate attempt to save coral]

The combined ski slope and power plant, with emerald green artificial turf that can be used year-round, is visible from the historic 18th-century city center across the harbor. It's the visual centerpiece of the city's efforts to reduce emissions by shifting to greener energy sources.

The city has also switched from coal to sawdust pellets left over from logging and lumber production to heat the water that runs from central plants to homes — a preexisting system called district heating that was already more efficient than home boilers.

"It's only a small city," said Joergen Abildgaard, head of the team running Copenhagen's climate plans. "But it matters. Because when you look at a global perspective, we know that people are moving to cities. We know there's a growing middle class. If those investments are done in a sustainable way, it's positive."

[Why didn't Greta Thunberg win the Nobel Peace Prize?]

Another major focus of the city's efforts is how people get around. Copenhagen officials estimate that at least 75 percent of all trips must be done by foot, bike or public transportation to meet the 2025 goals.

Bicycling was already popular — it's often the speediest way to get from one place to another. But city planners have brainstormed everything they can do to make biking even more attractive, right down to installing footrests at stoplights to make it easier for cyclists to wait out a red.

Also in the service of Copenhagen's emissions goals: A subway line opened in September with 17 new stations that encircle the city center.

And to reduce cars in the city center, Copenhagen has raised the annual resident parking fee from $1.48 to $148.

Jensen, the mayor, said the green sales pitch got more buy-in after a 2011 downpour in which 6 inches of rain fell on Copenhagen in less than three hours, causing massive floods and more than $1 billion in damage.

“All the citizens of Copenhagen could see: We have to act,” Jensen said.

Floods, such as this one in August 2010, have become more frequent in Copenhagen and helped change the political mood. ( )

Since the flooding, city planners and residents have sought to make the urban landscape more absorbent.

In one stretch of streets in Oesterbro, a dense district just outside central Copenhagen, parking spaces have been given over to plots of land where trees and bushes grow wild. A roundabout that was once a desolate stretch of pavement is now a birch-studded parkland. Cars still move through — but on narrowed lanes. Birds fly from tree to tree. Kids run across small footbridges.

[How hippies, farmers and Prince Charles are preserving the ancient art of hedgelaying]

“Something has happened in Denmark,” said Sara Jorn, who runs Miljoepunkt Oesterbro, a community organization that helped craft the area’s climate plans. “Politicians and leaders are listening now.”

In total, the city plans to spend about $400 million over the course of the 11-year effort, which started in 2013. But officials emphasize that economic growth has continued even while the city has invested in becoming greener. And they say residents will be shielded from rising fossil fuel prices, as well as from some of the damage from extreme weather events in a warming world.

Abildgaard, the Copenhagen project director, was tasked with making changes without sending costs for city residents soaring, which constrained some of his decisions. But he anticipates Copenhagen will reach its 2025 goal or come very close.

It has already cut its emissions by 40 percent compared with 2005, in which time its population increased by a quarter.

But some critics say the efforts don’t go far enough. Among other issues, being carbon neutral — the product of an elaborate set of calculations, offsets and assumptions — is not the same as being emissions free. Burning all those wood pellets still pumps carbon dioxide into the atmosphere, even if, in theory, new trees can be planted somewhere to reabsorb it.

The combined ski slope and power plant is the visual centerpiece of the city’s efforts to reduce emissions by shifting to greener energy sources. (Niels Christian Vilmann/Ritzau Scanpix/AFP via Getty Images)

Some have suggested that Copenhagen is cheating by not including its international airport — officially outside city limits — in its calculations.

And, perhaps the biggest issue of all, according to critics: The city's plan doesn't demand much sacrifice from its citizens.

"It doesn't require any changes at all for individuals," said Fanny Broholm, a city council member from the left-wing Alternative party. "And we need to change everything if we are to get to two tons" of carbon emissions per person per year.

Broholm said Danes need to consume less — something not addressed by Copenhagen's emissions plans, which focus on what comes out of the city's smokestacks, not on the environmental impact of purchasing a plastic toy from China, flying for a beach vacation to the Mediterranean or eating red meat.

[Are my hamburgers hurting the planet?]

In September, Broholm's party successfully pushed a plan to cut the meat in meals prepared by municipal kitchens. Copenhagen schoolchildren, city employees and seniors who eat at municipal elderly centers will all have less meat at lunch time.

"Eating burgers and meatballs and stuff — we shouldn't do it," Broholm said.

But Abildgaard said cities aren't necessarily well-placed to change that sort of individual behavior more broadly.

"You do have to ask: What is the role of the city when it comes to where they go on vacation, what they eat, what clothes they wear?" he said.

Denmark has invested heavily in wind energy, and for the first time this fall, wind turbines generated enough power for the whole country's electricity demands for a full 24 hours. (Ulf Svane/For The Washington Post)

Building a low-carbon society

Copenhagen got a partner for its climate efforts with the election of a center-left coalition in June, after a campaign dominated by green issues.

Among the top priorities of the new government: cutting national emissions 70 percent by 2030 from their 1990 levels.

"We're at 0.1 percent of emissions" globally, said Danish Environment Minister Dan Joergensen, whose government-issued car is a gleaming electric Mercedes sedan. "That's not going to save the planet. But we want to show the world that we can do this."

The goal has broad public support, and every major party in Denmark has signed on — even if Joergensen admits officials don't yet know how they can achieve it. Leaders say they will unveil how they'll get there, and how they'll pay for it, in the coming months.

There's a sweeping list of recommendations to consider, prepared by a commission, established in 2015, to advise Danish leaders on climate policy. Potential changes include slimming the size of Denmark's dairy herds, planting the countryside with fast-growing willow trees to burn later for energy production, and ushering out cars that use internal-combustion engines in favor of electric ones.

Danish leaders say they want to demonstrate that it is possible to live sustainably without massive new spending commitments or a hit to living standards.

Louise Purup Nohr commutes with her children by bike. (Ulf Svane/For The Washington Post)

By many measures, they are already moving in the right direction. On Sept. 15, for the first time, wind turbines generated enough power for all of Denmark's electricity demands for a full 24 hours. It was a milestone in the country's effort to become fossil-fuel-free by 2050, a commitment made by a previous center-left government.

Danes already face steep taxes intended to encourage green-friendly choices: Car buyers pay an 85 percent tax on the first $27,500 of any car purchase. Above that price, the tax rises to 150 percent. That's actually less than the tax used to be, and the new Danish leaders are considering raising it again.

[Revolutionary recycling? A new technology turns everyday trash into plastic treasure.]

Green efforts in other Western European countries have at times tripped up politicians. French President Emmanuel Macron sparked months of "yellow vest" protests in France when he proposed raising his country's gas tax. His critics said he wasn't being mindful of the economic difficulties of rural populations.

Danish leaders, fresh off their electoral victory, say that they have a strong mandate to go green. And they say relatively low levels of inequality in Denmark will help insulate them from complaints.

For now, they say, Danes have told them to be ambitious.

"Instead of asking what's possible, we ask what's necessary," Joergensen said.

Louise Purup Nohr and her husband, Bjarne Bodholdt Purup, are motivated by the thought of the world they are leaving behind for their children. (Ulf Svane/For The Washington Post)

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