



Canadian
Electricity
Association

Association
canadienne
de l'électricité



NILOUFAR

When my husband and I came to Canada in 1995, we rented a tiny apartment in Scarborough. It was fine, for a young couple, but I hated living on the eleventh floor. I swore I'd never live in such a tall building again.

But the condo I visit with my grandson Faisal is in one of the tallest I've ever seen.

It shines in the sun, angled and sculpted in pieces that look like artichoke leaves. Faisal goes on about graphene and carbon, but I'm more interested in the floor lighting and the push buttons on all the doors. It means I can get around easily on my own, which is not always a given, since the stroke I had a few years ago.

I ask the real estate agent about the bus stop. I need to be able to walk there in the winter. We have so many ice storms in Toronto now and I don't want to be stuck at home half the year, because if I fall, I could break something.

She tells me the sidewalk out front is heated, all the way to the bus stop. Heated sidewalks! She says it's to keep the ice off, but it seems like a terrible luxury to me. Where are they going to get the energy for that, I'd like to know?

The agent says the building gets power from turbines built into the top, and from solar panels on some of its weird angles. The artichoke leaves, it turns out, are sun shades that move around the building, following the sun.

It's connected to a neighbourhood geothermal system for heat and cooling, and for those heated sidewalks.

I'm always skeptical about such claims, so I ask her how a consumer like me is supposed to know it will deliver net-zero emissions.

She tells me that the provincial government has new consumer protection rules, to respond to all the new companies and new technologies competing now.

Faisal pulls out his phone. He uses eye tracking to pull up an app that will give me information about power use and emissions in real time. And my phone's camera will also be able to tell me whether the sidewalk heating is on and working.

The real estate agent takes us out onto the green roof, which I have to admit is lovely. Faisal and I sit on a bench beside a magnolia tree and the agent leaves us for a few minutes so we can talk.

Faisal asks if I'll take the place. He doesn't quite succeed to hiding the hopeful tone to his voice.

"I suppose so," I say. "If you'll come and visit me here."

He laughs and reminds me of when he was a little boy and I'd tell him not to build castles in the air when I was trying to teach him to be practical. How funny, he says, that my castle in the sky turned out to be very practical after all.



ERIC

There's only a moment of silence, before the generator comes on. Not even a moment. A mere flicker. But it's a flicker that stops my heart. I know the quality of that silence. It's like what Sherlock Holmes called "the curious incident of the dog in the night-time." Sometimes the absence of sound is the loudest thing there is.

My husband Tom and I founded Tomeric Tool and Die soon after we moved to Manitoba. We had both worked in manufacturing for years and wanted to do our own thing, combining the newest in 3D printing technology with traditional, hands-on values. We make the components for the machines of the twenty-first century, and we are proud of that.

We're also proud of the fact that we employ one hundred and thirty people and sponsor the local hockey team. When the factory's heart skips a beat, the lifeblood of the town is at risk. Tomeric Tool and Die started out hooked into the provincial electrical grid. Coming from Atlantic Canada, Tom and I were used to the stable, predictable power. But after the cyberattack in 2034, when we lost power for eight days in the dead of winter, we got fed up. And we weren't the only ones. So many people switched over to their own small, generator systems, while the utility price kept going up and up.

Making the switch ourselves seemed like a no-brainer. A lot of towns installed small modular reactors, with government help. For the factory, we decided on biomass. We paid to install our own combustion facility for combined heat and electricity.

And we installed a smart system with sensors to control lights and heat. It's been working great. Until today. At 2:34 in the afternoon, the power flickered, and now all the lights are dim as the generator keeps the machines going.

The carbon monoxide detector went off in the combustion facility, and triggered a shut-down. The levels in the factory itself must be fine, or else everyone's phone would be buzzing and chirping. Toxin detectors are standard in phones these days.

But just in case, I use the walkie-talkie mode on my phone to order tools down and an evacuation. Better safe than sorry.

The repair crew must have got an alert; the truck pulls up just as I finish giving the evacuation order. I walk around to the gathering point in our front parking lot to see how everyone's holding up. "Is the power supply going to be OK?" one of the newer hires asks, and I see a lot of concerned faces.

"It's fine, yep. And if there were ever a problem, Tom and I would make sure we fixed it. We're not dependent on anyone now. Cyberattack? We'll be fine. Flooding? We'll be fine. Zombie apocalypse? Fine."

That last bit gets a laugh, and I laugh too, in relief. Things really are going to be OK. We've gone our own way, do-it-yourselfers at heart, but we've also built a community out of that spirit.



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LARGE-SCALE RENEWABLES

CANADIAN ELECTRICITY ASSOCIATION - SCENARIOS

03

BRODY

There's a story my mom likes to tell about me. When I was eight, I set up a lemonade stand on our road, and added a solar-powered phone charging station. My parents laugh about how I've always been one to dream big, and I guess that's true.

But truth be told, I was probably inspired by the way my community dreamed small. I was born in 2019 in a First Nation on Vancouver Island. By then, our community was already getting its power from its own solar and wind installations, and selling power back to the B.C. grid.

Now I'm a filmmaker, just about to finish my degree, and I want to start my own digital animation company, one that will specialize in films written in Indigenous languages. We'll use augmented reality to help people bring those stories into their lives in new ways.

I want to make sure it starts on a sustainable foundation – sustainable in every way. It's got to be cost-effective, because let's face it, I'm a 21-year-old entrepreneur. But it also has to respect the path my community has forged in renewable energy.

These days, government subsidies just aren't there for small-scale rooftop solar panels. Those little solutions just haven't been able to compete since the battery technology got better and large-scale renewables became dispatchable. There's even a network of batteries that pays homeowners when it draws on their home batteries as needed. And they've turned the rivers into energy storage, pumping water up when there's excess from the solar and

wind, and using it to run the hydro generators when there isn't. I can buy my power from the grid and feel pretty confident that it'll be clean, renewable power, for less money than anything I could build myself.

Still, though, there's something I like about the idea of being less reliant on the grid. It's how I grew up. And at least it's under my control, unlike the massive grid with its dams and huge wind farms.

So far, climate change hasn't had any ill effects on hydro power in B.C., but that's about to change. By 2050, just ten years from now, the melting ice fields could mean a totally different landscape for hydroelectricity. The era of cheap prices could be over soon. Every year, there are more storm outages. I need reliable power over the long term, no matter what changes.

The grid is the most economically sound option, but there is a way I can take back more control: my company's energy use. There are many technologies that can reduce electricity use and help me find efficiencies in even the tiniest ways. Tiny ways add up.

Buying power from the grid is the most economically sound choice these days. And it makes sense to use information technology to increase efficiency. Maybe I can set up a local network with its own energy-demand analysis. Just like I set up my own solar panels for my lemonade stand.



DIDI

I'm a single mom who's had to get through some hard times. I'm not used to relying on other people.

But my bandmates are an exception. My friends Yannick and Fatima and I formed Blue Screen of Death nine years ago, now; I remember my daughter was still young and it was around the time of the 2031 federal election.

Now we're about to go on our first tour, all the way from Montreal to the west coast.

We could finally get somewhere.

But first, we have to actually get somewhere. To save money on charging the vehicle, we're using Yannick's small car instead of a van, and we're renting our instruments in each city. These days, goods-sharing is not only hip in everything from clothing to electronics. You can rent a bass guitar for a few hours for the cost of a fancy coffee.

As we whirr along the Trans-Canada somewhere on the northern edge of Lake Superior, the route itself seems to encourage that feeling of giving it our all. We pass the statue of Terry Fox near Thunder Bay, and every time we stop to recharge, I'm struck by how much better the EV infrastructure is than the last time I took a road trip out this way. We cross the Manitoba border and there's no difference in the charging prices or even the look of the stations.

There was never a Last Spike moment for the EV network, no big photo op, but it's connected the country. The subsidies made electric cars competitive with gas cars, and the infrastructure sprang up pretty quickly once the government made it a priority. Technologies change, but the way they're used depends, always, on political will. Plus ça change, plus c'est la même chose.

We're probably even using Quebec hydroelectricity from home; we've been exporting to Ontario more and more over the last few years. The federal government created the National Power Fund to encourage interprovincial cooperation, as part of its national energy policy. The result is an east-west power grid, where provinces that have plenty of hydro sell it to those that don't.

Halfway between Winnipeg and Regina, the charging station is out of service. It's the middle of the night and I'm driving while my band mates sleep. I keep going, hoping we can make it to the next one, but the car limps to a halt. I swear under my breath.

Yannick and Fatima wake up, rubbing their eyes, and I tell them we're out of juice and will have to get help. That's when Fatima grins, and goes around to the trunk. She rummages around, saying that she never travels without a spare tire, a tool kit, a blanket, a flare, and an emergency power supply. She holds up a little black box with a cable running from it. It won't get us far, but it does get us to the charging station.

We'll get there. Together.