



The Cadillac ELR looks more luxury than hybrid with LED headlamps, big 20-inch blade wheels and a wide, low-slung design.



The instrument cluster in the ELR is completely digital — here it shows the remaining battery charge and a friendly reminder to plug in.

by Benjamin Yong

# Green

Some high-tech electric vehicle options are now on the market, and the support infrastructure is catching up.

Remember when only activists and Hollywood celebrities drove hybrids and the general public made fun of anyone else who announced he was purchasing a Toyota Prius? With all industries trending towards environmental awareness, those days are long behind us—and there is no better evidence of this than the fact that virtually every major auto

manufacturer is producing at least one model powered by electricity.

### Mainstream Luxury

The newest darling of the green motoring world is the recently released BMW i3 fully electric vehicle (EV), part of the “sustainable

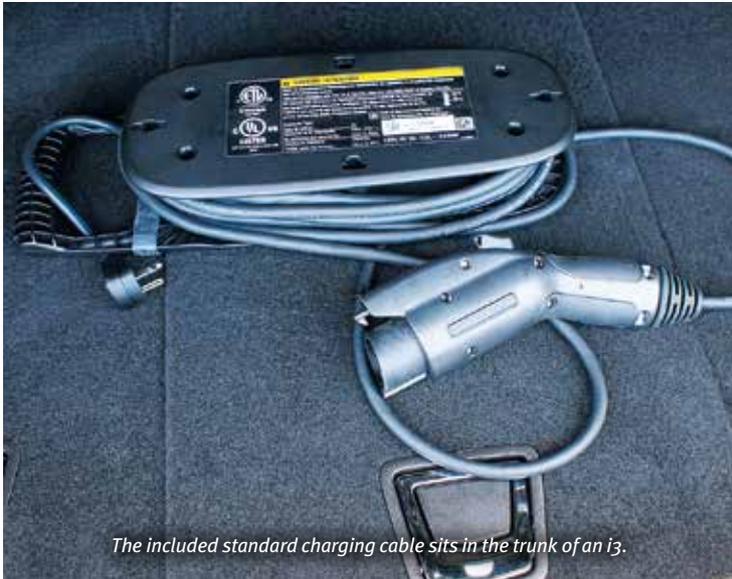


Outside BMW Canada headquarters in Richmond Hill, Ontario, a lone i3 receives a fill-up of electricity.



The BMW i3 features a mixture of technology and nature. A display screen sits atop a Eucalyptus-wood dash.

mobility” i division at Bavarian Motor Works. What makes this little hatchback special in a sea of EVs is that it represents the luxury German carmaker’s first such mainstream production offering. This means that customers can expect the same level of quality as in the rest of the BMW lineup, even though the design



The included standard charging cable sits in the trunk of an i3.



Side profile of the all-new, all-electric BMW i3.

# Motoring

photos Benjamin Yong

approach to this car is unlike anything BMW has done before. Rather than just installing some batteries in a 3 Series vehicle, BMW chose to make the entire manufacturing process unique.

**“Virtually every major auto manufacturer is producing at least one EV.”**

“BMW i is this nice little incubator within the company that allows us to experiment a little bit, get some learning, and then bring it into the rest of the business,” says Marc Belcourt, national manager for the i program at BMW Canada. “When it came to this car, we didn’t just tap into the existing production line in Leipzig (Germany). We built an entire new production facility, which is powered by wind turbines. You can see these massive turbines right outside the plant, generating renewable energy to make the i3 and the i8.”

Part of the reasoning behind setting up a fresh facility is simply that a lot of the materials used in construction are entirely different. Plenty of lightweight materials are

utilized, including carbon fibre and aluminum for the body and chassis. Natural ingredients, such as European-sourced eucalyptus wood, and partially recycled fabric can be found throughout the cabin. In fact, one-quarter of the entire interior is recycled.

“We use 50 percent less energy because we’re not stamping metal all the time. The car takes about half the time to produce versus the 3 Series because it’s less complex and uses less parts,” adds Belcourt. “We use 70 percent less water because we’re not pre-treating any of the materials. We have no chemical undercoating on the vehicle, and we’ve got a more efficient paint process.”

The differences don’t end there. The i3 doesn’t quite look like any other vehicle in the family either, or like other EVs in general. Sure, there is the trademark kidney grille and badging, but the rest of the car looks like it belongs in another decade. The body is short and stout, with contrasting black hood, roof, liftgate, and accents. The irregularly shaped rear windows dip down into the rear doors that have no handles and open suicide-style for easier access. On the inside, two freestanding monitors replace a conventional instrument cluster and dash switches. The wooden dash

resembles a vintage coffee table.

With 170 horsepower, 184 pound-feet of torque, and a curb weight of 1,195 kilograms, the i3 is faster than a lot of pure electrics, going from 0 to 100 km/h in 7.2 seconds. Fitted with a 130-kilowatt electric motor and an 18.8-kilowatt-hour lithium-ion battery, it has an approximate range on a full charge somewhere in the neighbourhood of 160 kilometres. That is more than enough for the company’s target urbanite demographic who travel on average less than 60 kilometres a day. For those suffering from “range anxiety,” BMW offers an optional Range Extender (REX) model—only available from the factory with no ability to be retrofitted—upping the total driveable distance to approximately 300 kilometres.

## A Caddy Alternative

If that still doesn’t sound like it is enough, fortunately there are other technologies available that provide an experience closer to that of a conventional fossil-fuel-powered automobile. In a similar luxury vein is the all-new Cadillac ELR, an extended-range, plug-in hybrid that uses a small gasoline engine to

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A Chevrolet Volt, the Cadillac ELR's first cousin, sits in a public underground electric vehicle charging station at the popular Metroropolis at Metrotown shopping centre in Burnaby.

support its 135-kilowatt electric mill. Like the i3, it can run on pure electric power—up to 56 kilometres, depending on driving habits and environmental factors. However, when the juice runs out, a 1.4-litre Ecotec four-cylinder kicks in to extend the range to 480 kilometres.

While the ELR still relies partly on electricity and partly on gas, the main purpose of the inline four is not to drive the wheels (although it will do that on occasion) as on a traditional hybrid. Rather, the engine powers a generator that recharges the 16.5-kilowatt-hour battery.

**“If no one told you the car was a hybrid, you probably wouldn't know.”**

There are things the driver can do to help out, such as using GM's innovative “regenerative paddles.” These are hidden behind the steering wheel where paddle shifters normally live. Tugging on them activates a braking function in which the kinetic energy created from slowing down is converted and siphoned back into the battery. They take a little time, but when used effectively—coasting to a stop, or gently proceeding down a hill, for instance—the paddles can keep the battery in a healthy state.

This feature is not unique to Cadillac. The i3 does something similar every time

the gas pedal is released, which creates a slight jerking response. The Mitsubishi i-MiEV requires the driver to shift the gear lever to a “B” mode, which can become tiresome. Cadillac's method of implementation works better than most.

Besides mimicking a “normal” vehicle's range, the ELR looks like something you would expect to see flipping through the latest Caddy catalogue, nestled between a CTS and an ATS. Part of its appeal is that if no one told you the car was a hybrid, you probably wouldn't know. There are no spaceship aesthetics, leaf badging, or other obvious indicators—just clean, defined lines, a low, sleek profile, and an elegant, minimalistic

interior. Where BMW has recycled cloth seats and wooden dash surfaces, GM coated the interior with cut-and-sewn, semi-aniline leather. The music and climate are controlled by a familiar Cadillac User Experience (CUE) infotainment system, centred around a modest screen and touch-sensitive buttons.

The performance is on par with that of anything else the company makes. The combination power plant is good for 207 horsepower and 295 pound-feet of torque, and there are a variety of modes that can manipulate the feel of the car. The default Tour setting is geared for comfort and maximum mileage. The self-explanatory Sport gives a more responsive throttle. Mountain is optimized for travelling up and down steep grades. And a neat Hold option forces the gas engine to stay on, so the battery charge can be saved during energy-hungry trips down the highway.

**Support Infrastructure**

There are several more examples of EVs now on the market and on the horizon, and, thanks to trendy big-brand alternatives such as Tesla, EV popularity is at an all-time high. However, the majority of the public have yet to hop on the green train—largely due to a chicken-and-egg scenario with EVs and an adequate support infrastructure. Public-charging options can be plentiful or limited, depending on the city that you live in. Most (530 in British Columbia) are standard 240-volt, or Level 2, chargers, which on average take four to five hours to yield a full

charge. DC fast chargers can cut that time down to 30 minutes, but are scarcer. Surrey was the first city in B.C.'s Lower Mainland to have a unit installed, at Powertech Labs, a subsidiary of BC Hydro. Seven other sites are scattered around the province, with several more planned in the coming months.

**“The majority of the public have yet to hop on the green train.”**

“By 2016, there will be over 600 similar stations all over B.C., with 30 being fast chargers,” said Powertech president and CEO Don Stuckert, during the public unveiling of the Surrey station last fall.

Until that time, there are handy tools that can help make electric vehicle owners' lives easier. The *PlugShare.com* website has a map showing available public stations in any given area. Detailed information, including number of spots and type of power supply, are shown. Even addresses where people have opened up their personal residences to passersby for top-ups are indicated. For i3 owners, BMW offers a comprehensive app called iRemote that is part of the ConnectedDrive interconnectivity suite. It can show a user the most efficient route to get to a destination, taking into account battery level, driving style, and traffic conditions. The intermodal route guidance takes into account other forms of transit when helping plan a route, and may suggest walking or taking mass transit to get you where you need to go the quickest.

**“The current infrastructure isn't perfect—yet.”**

Despite all of these gadgets, the current infrastructure is not perfect—yet. That does not seem to be deterring car companies from pushing the envelope, giving consumers a wide array of choices when it comes to alternately powered machines.

“More and more people are seeing sustainability as a trend that they would like to be a part of and they would like to associate with,” says Belcourt. “People's values are changing.” ■