

# Purpose-built

## Ioniq: Hyundai's new full-spectrum alternative powertrain lineup

by Joe Sage

Eight years ago, Hyundai revealed a comprehensive BLUE-DRIVE strategy at the LA Auto Show, based around breakthrough lithium-polymer batteries and a comprehensive hybrid system, as well as efforts with biofuels and fuel cells. About six years ago, they released the Sonata Hybrid, an adaptation of that popular midsize sedan, joined a year and a half ago by a plug-in hybrid variant. One of Hyundai's more daring moves is the Tucson Fuel Cell, the world's first such mass production vehicle (only available in parts of California, as well as in South Korea, Europe and Vancouver BC.)

But they've never built a dedicated green vehicle. Until now. It all changes with Hyundai Ioniq.

The Ioniq lineup is a sea change for Hyundai and also for the customer, particularly in the hybrid mindspace long dominated by one brand. Hyundai

is coming right out of the gate with three alternatives: Ioniq Hybrid, Plug-In Hybrid and Electric—a force-multiplying approach for a new brand. As Hyundai corporate and product planning VP Mike O'Brien says, "you can choose your level of green."

They had a challenging mandate: to deliver the highest fuel mileage, along with a dynamic drive, dubbed their Gold Medal Project (or internally Mission: Impossible). The project is complete, and now Hyundai has the product lineup to give it a go.

Ioniq is a dedicated alternative powertrain lineup, but has been developed with a more mainstream design, a car people will gravitate to for its good looks, performance and utility, with extremely high fuel mileage simply a bonus. The car has an energy-efficient streamlined slip-shape, what they call a "visual arrow." They have also made it fun

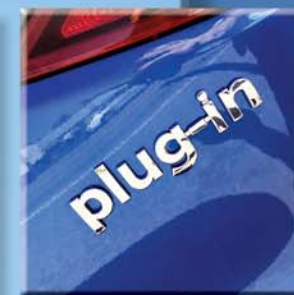
to drive, with much attention paid to everything from drive modes to suspension and steering.

The time is right. EPA mandates reach 54.7 mpg by the middle of the next decade. And as millennials eclipse baby boomers, it's notable that they say the presence of EVs influences them toward a manufacturer (regardless of what they buy).

Hyundai also notes that autonomous cars are on track to be fully implemented during Ioniq's first generation, and they are also ahead of the curve on this, having brought a fully autonomous Ioniq to CES this year—the first to have all its technology hidden (no rooftop tower of cameras and sensors).

It's a good time for them to hop aboard this wave: since 2013, green auto sales have dipped in the face of inexpensive gasoline. So time to dive in and start paddling. By the time the next big swells develop, Hyundai will be hangin' ten.

Each of the three Ioniq powertrains has a significant achievement already under its belt. The Hybrid has a 58 mpg EPA rating, the highest of any vehicle with no plug and higher than requirements for 2025. Ioniq Electric hits 136 MPGe, the highest for any EV, and the lowest "cost to drive 25 miles."



at 81 cents versus an average of \$2.24.

First to market is the Ioniq Hybrid, which should be on sale by the time you read this. The Ioniq Electric hits California in April and works through a wider rollout from there. Third will be the Plug-In Hybrid, in the fourth quarter of this year.

Mindset varies with each. Everybody has some idea what a hybrid does, which helps Ioniq jump right into the game and stake its turf. People are increasingly aware that electric vehicles (EVs) are here to stay this time, no longer a novelty item. The Plug-In Hybrid offers elements of both, with a beefier battery than the Hybrid and a plug (the battery is considerably smaller than the Electric's, fully charging in about half the time and letting you drive all electric for about a 27-mile range, or drive it as a gas-pump-only hybrid for as far and as long as you like without any need to plug in.

Ioniq Hybrid and Plug-In Hybrid are powered by a 1.6-liter GDI Atkinson Cycle engine plus an electric motor (larger in the Plug-In Hybrid, for its 27-mile EV-only range). Ioniq Electric has the biggest battery and motor—and longest range by far, 124 miles. Sure, some EVs have over 200 miles of range, Hyundai admits, but they say the last hundred doesn't offer any benefit to 98 percent of customers, and for the bigger range you have to spend \$40,000 or more instead of the low \$20s. It's an approach similar to recent lower tow capacity decisions on some vehicles. In both cases, they save weight and fuel by engineering for the highest common denominator, not the biggest number.

Ioniq Hybrid, Plug-In Hybrid and Electric drivetrain batteries all come with a lifetime warranty.

The hybrids have a 6-speed EcoShift dual clutch transmission, engineered specifically for this duty,

KEEP RIGHT >>

We covered many a country mile outside Santa Barbara in this Hyundai Ioniq Electric, recognizable by its solid grille. The Ioniq Hybrid is already hitting dealerships; the EV starts its rollout in April; and by the end of the year, those are joined by an Ioniq Plug-In Hybrid.



### SPECIFICATIONS

DRIVETRAIN .....FWD  
 STEERING.....rack & pinion elec, column-mtd  
 LENGTH / WHEELBASE .....176.0 in / 106.3 in  
 DRAG COEFFICIENT .....0.24 Cd  
 PASSENGER/CARGO VOLUME ...96.2 / 26.5 cu.ft  
 TOTAL INTERIOR VOLUME.....122.7 cu.ft

### IONIQ HYBRID

ENGINE .....1.6L GDI Atkinson Cycle 4-cyl  
 HP/TORQUE .....104 hp / 109 lb-ft  
 ELECTRIC MOTOR .....32 kW interior-permanent magnet synchronous  
 HP/TORQUE .....43 hp / 125 lb-ft  
 TOTAL SYSTEM NET HORSEPOWER .....139 hp  
 BATTERY .....Li-ion polymer 240v 1.56 kWh  
 TRANSMISSION .....6-spd EcoShift dual clutch  
 SUSPENSION .....F: MacPherson strut  
 R: independent multilink  
 WHEELS....15-in Eco-spoke (17-in alloys opt)  
 FUEL CAPACITY .....11.9 gal  
 WEIGHT .....2996-3172 lb  
 MPG...Hybrid Blue: 57/59/58 (city/hwy/comb)  
 SEL/Limited: 55/54/55 (city/hwy/comb)

### IONIQ PLUG-IN HYBRID

ENGINE .....1.6L GDI Atkinson Cycle 4-cyl  
 HP/TORQUE .....104 hp / 109 lb-ft  
 ELECTRIC MOTOR .....44.5 kW interior-permanent magnet synchronous  
 HP/TORQUE .....60 hp / 125 lb-ft  
 TOTAL SYSTEM NET HORSEPOWER .....139 hp  
 BATTERY .....Li-ion polymer 360v 8.9 kWh  
 TRANSMISSION .....6-spd EcoShift dual clutch  
 SUSPENSION .....F: MacPherson strut  
 R: independent multilink  
 WHEELS .....16-in Eco-spoke alloys  
 FUEL CAPACITY .....11.4 gal  
 WEIGHT .....t.b.d.  
 CHARGE TIME.....220/240v lvl2: 2 hrs 30 min  
 MPG .....t.b.d.  
 ELECTRIC-ONLY RANGE .....over 27 miles

### IONIQ ELECTRIC

ELECTRIC MOTOR .....88 kW interior-permanent magnet synchronous  
 HP/TORQUE .....118 hp / 215 lb-ft  
 BATTERY .....Li-ion polymer 360v 28.0 kWh  
 TRANSMISSION .....single-speed reduction gear  
 SUSPENSION .....F: MacPherson strut  
 R: torsion beam  
 WHEELS .....16-in Eco-spoke alloys  
 WEIGHT .....3164 lb  
 CHARGE TIME.....220/240v lvl2: 4 hrs 25 min  
 DC fast charge: 80% in 23 min (100 kW)  
 or 80% in 30 min ( 80 kW)  
 MPGe / RANGE .....136 MPGe / 124 miles





and a familiar lever-type shifter with eco, sport and manual modes. In eco mode, the Hybrid can kick off its gasoline engine and rely on the electric motor as appropriate for best fuel economy. In sport mode, the engine is always running, with the electric motor contributing to performance.

Ioniq can combine outside world and onboard information to maximize fuel economy: set your destination, and the car will optimize power and coasting, as it knows where the hills will be. You can also assign functions such as climate control to particular drive modes for energy optimization.

Ioniq Electric has a button-controlled shift-by-wire controller, a geometric array on the console. We're not always fans of alternative shifter interfaces, but the visually arranged set of D-N-R and park buttons on Ioniq's console is easily intuitive, and its storm trooper style suits the machine.

The Electric can access normal coast-down or four levels of regenerative braking via shift paddles, a version of one-pedal driving or percentages thereof, where right foot inputs both speed you up and slow you down, which provides very enthusiastic performance in the twisties.

Ioniq is green inside and out, from soy-based exterior paint, to interior fabrics made with 25 percent sugar cane and surfaces of lightweight vol-

canic stone and wood recycled "natural plastic."

Gauges and screens are intuitive, with tactile piano key controls, while LCD screen menus can access all the hypermiler details you may want (we exceeded 58 mpg in the hybrid and *allmosst* hit 60, just driving normally, i.e. aggressively).

Ioniq is purpose-built as a hybrid or electric, with smaller engine space and fuel tank space than in an adaptation of an existing vehicle, for a spacious cabin in an efficient body footprint. Comparing body dimensions and interior volumes with other hybrids and electrics, Ioniq comes out on top, beating almost all at each thing, and most at all of it.

Hyundai Ioniq has been conceived to bring the mystique of alternative powertrains into the mainstream—not to be green just to be green, not to have oddball look-at-me styling—simply to offer a sound, extremely fuel-efficient choice in an attractively designed and neatly engineered new package, all starting at just \$22,200.

It's what only a clean-sheet project like this can deliver. The Ioniq team has achieved their Mission: Impossible—and they have the gold medals to prove it. Hyundai VP of research and development in Korea Ki-Sang Lee commissioned 500 such medals for the development team and personally flew to the US to present them. ■

#### FIRSTS, ACCOLADES, STATISTICS

The eco-focused Hyundai Ioniq is the first vehicle to offer three distinct electrified powertrains on a single, dedicated platform. Hyundai's approach for the Ioniq lineup delivers aggressive design and a dynamic driving experience and is a key milestone in Hyundai's global sustainability strategy.

- ▼ First vehicle offered in three electrified powertrains
- ▼ First in aerodynamics: industry-leading 0.24 drag coefficient delivered by "visual arrow" shape, integrated rear spoiler, wheel air curtain and underbody cover
- ▼ #1 in no-plug fuel efficiency: 58 mpg
- ▼ #1 in EV efficiency: 136 MPGe
- ▼ Lowest operating cost: EPA "Cost to Drive 25 Miles" 81¢ for Ioniq Electric, \$1.00 for Ioniq Hybrid Blue
- ▼ Most kilowatt-efficient: nine competitors are 8.8 to 31.6 percent less kilowatt-hour-efficient than Ioniq, using between 300 and 1650 more kWh per year than Ioniq
- ▼ Ioniq Electric's range of 124 miles covers 98 percent of drivers
- ▼ Ioniq Plug-In Hybrid will have greater than 27-mile range in full electric mode
- ▼ Ioniq Electric named to ACEEE (American Council for an Energy-Efficient Economy) list of "Greenest Vehicles of 2017," for its life-time environmental impact

#### PRICING

| IONIQ HYBRID                    |          |
|---------------------------------|----------|
| HYBRID BLUE.....                | \$22,200 |
| SEL.....                        | \$23,950 |
| SEL w/Tech Package.....         | \$24,950 |
| LIMITED.....                    | \$27,500 |
| Limited w/Ultimate Package..... | \$30,500 |

| IONIQ PLUG-IN HYBRID         |        |
|------------------------------|--------|
| PRICING AND TRIM LEVELS..... | t.b.d. |

| IONIQ ELECTRIC                         |          |
|--|----------|
| ELECTRIC.....                          | \$29,500 |
| (after \$7500 federal tax credit)..... | \$22,000 |
| ELECTRIC LIMITED.....                  | \$32,500 |
| (after \$7500 federal tax credit)..... | \$25,000 |
| Limited w/Ultimate Package.....        | \$36,000 |
| (after \$7500 federal tax credit)..... | \$28,500 |
| DESTINATION CHARGE.....                | 835      |

