

THE NEW RENAULT E-TECH WORLD PREMIERE AT THE BRUSSELS MOTOR SHOW



**Groupe Renault ramps-up its electric
vehicle strategy with the New Renault
Clio E-Tech and the New Renault
Captur E-Tech Plug-in**

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Introduction

Following the 2019 presentation of the **New Clio and New Captur**, Renault world première the new hybrid and rechargeable hybrid variants of its two best-sellers – **New Clio E-TECH 140hp and New Captur E-TECH Plug-in 160 hp¹** – during the 2020 Brussels Motor Show.

These latest models are new additions to what is already the largest electric vehicle range on the market: ‘full hybrid’ with the New Clio E-TECH, ‘full plug-in hybrid’ with the New Captur E-TECH Plug-in, and ‘100% electric’ with the New ZOE. **A line-up, soon to be extended to the upper segment with Mégane E-TECH Plug-in where customers can choose the right car for their needs** (long distance, urban multi-purpose, etc.) depending on the preferred technology, while limiting CO₂ emissions and stemming fuel use, even for long trips. Having a full hybrid range means more people are going to experience the joys of driving an electric vehicle.

EV expertise

Groupe Renault is a **pioneer and expert in electric mobility** – the cornerstone of the Group’s current and future commitment to sustainable mobility for all. For **more than 10 years**, the Group has garnered expertise in electric vehicles that translates into more dynamic and efficient hybrid motors.

Thanks to work carried out on developing true multi-modal hybrid motors, as opposed to merely fitting out traditional combustion motors with electric capabilities, E-TECH motors guarantee:

- electric-only start up every time.
- enjoyable driveability in all circumstances.
- excellent fuel efficiency thanks to its smart multimodal gearbox, efficient regenerative braking, and high capacity battery recharging; all of which is thanks to the combined expertise acquired Formula 1 and electric vehicles.

The New Clio E-TECH materializes these assets with 80% of the time spent on city roads in all-electric mode, for a consumption saving of up to 40% compared with an internal combustion engine in the urban cycle. The New Captur E-TECH Plug-in can run at 100% electric for 50 kilometres with a top speed of 135 kph in mixed use (WLTP) and 65 kilometres in urban use (WLTP City).

Innovative technology

The drive train used across the board in Renault hybrid motors is modular, with one of **two variants: E-TECH for ‘full hybrid’** (HEV or “hybrid”) and **E-TECH Plug-in for ‘full plug-in hybrid’** (PHEV or ‘rechargeable hybrid’). Integrating the new technology into these two models is easy thanks to both the new CMF-B modular architecture that was designed from the outset to take on electric capabilities and the fact that E-TECH systems are more compact than ever before and can be mounted in the engine bay of a versatile sedan, such as the New Clio.

Renault engineers have devised an innovative solution for a hybrid range that is relevant, original, and exclusive – with more than **150 patents** – and based on a **hybrid “series-parallel” architecture** to ensure the largest range of combinations and the best CO₂ gains when on the road.

¹ Plug-in (‘rechargeable’) hybrid vehicles are fitted with a battery that optimize electric driving thanks to its ability to be recharged by electrical connection. The battery lasts longer than in hybrid vehicles where the battery recharges only while the car is being driven.

The hybrid car range also taps into the extensive knowledge base of the **Renault F1 Team**. Production model hybrids share and benefit from **technology originally developed for F1 racing**.

Sustainable mobility for all

The new hybrid motors also draw on **experience and synergies from throughout the Alliance** that go hand in hand with those developed by Nissan and Mitsubishi. Ultimately, within the Alliance, there is a better range of technological solutions that are adapted to each market's specific needs and in line with the global and local strategies of each brand.

Groupe Renault strives **to provide sustainable mobility for all, both today and in the future**. This latest arrival of motors is a next step towards reaching that goal. By 2022, the Groupe Renault plans to ramp-up its electric range with 8 fully electric models and **12 electric-capable models** (hybrid and rechargeable hybrids).

When race cars inspire production cars



Auto racing and Renault's involvement in Formula 1 are at the heart of the company's work on E-TECH hybrid motors. Bridges between the racing world and production vehicles fall into two main categories: energy management and recovery and the use of a multi-mode dog gearbox, for the first time in a production vehicle.

Energy optimization at the heart of knowledge sharing

Ever since 2013, the Renault F1 Team and Renault engineering have shared their respective knowledge in the field of energy management. To prepare the arrival of hybrid motors in Formula 1, engineers, experts in hybrid - now in charge of Renault E-TECH models - worked on developing a Formula 1 hybrid motor at the Renault Viry-Châtillon site. There, they finetuned their energy management strategy now used in designing Renault's hybrid models.

It is mainly thanks to such knowledge sharing that E-TECH engines combine driving pleasure with high efficiency **in terms of speed regeneration and energy use.**

Be it a Formula 1 engine or in production motors, both have an optimal RPM yield point (thermal output versus amount of fuel used). In both cases, the laws of energy management are designed to utilise the optimal energy output to recharge the battery anytime the energy created is above the required power.

As in F1, kinetic energy can be recovered during deceleration and braking then transformed into electrical energy to recharge the battery. On standard vehicles, especially when on motorways, energy management rules start charging the battery by forcing the engine to operate its optimum RPM yield. Excess energy can then be used to relieve the combustion engine when the accelerator is worked harder than normal, or to ensure a 100% electric ride when the scheduled route goes through urban zones.

On standard models with the E-TECH Plug-in engine, the SPORT mode in multi-SENSE settings allows all the thermal and electrical power to be used simultaneously, thereby granting more driving pleasure and efficiency when accelerating. When considerable pressure is put on the accelerator, the two electric motors provide combined additional power to the combustion engine. **Such a practice comes directly from Formula 1**, where drivers can put the car into a specific mode to get maximum available power, especially during qualifying rounds.

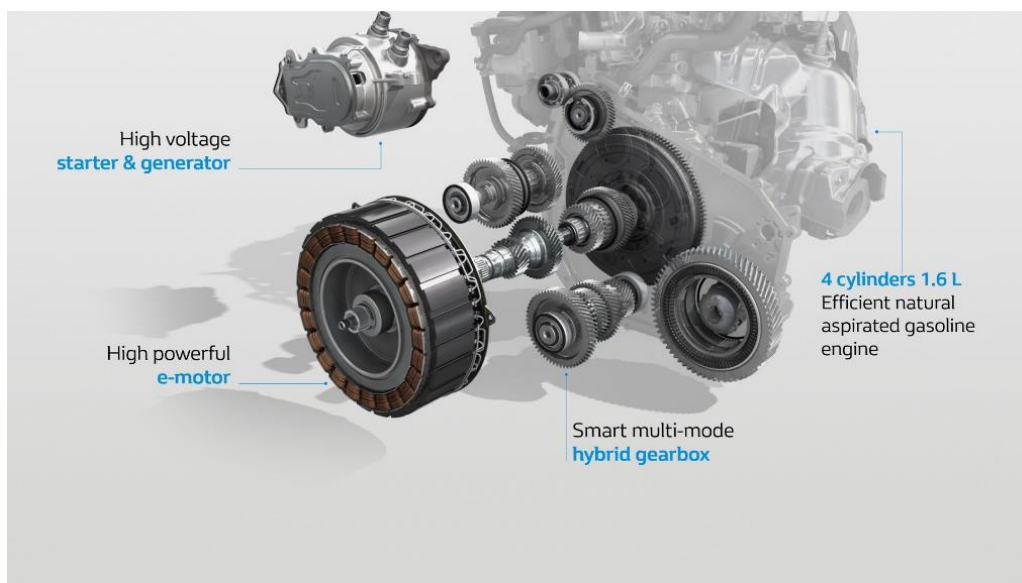
Great reactivity thanks to the innovative gearbox

The Renault E-TECH **engine powertrain architecture** is based on similar foundations to that of the Renault F1 Team's single-seaters: a combustion engine combined with two electric motors and a central battery. This architecture is paired with a **multi-mode dog gearbox**.

The clutch-less gearbox allows for a 100% electric start, and **significantly reduces gaps in acceleration during gear changes**, which enhances driving comfort and performance while accelerating. **In F1**, the smooth gear changes mean less jerkiness and less loss of grip.

Renault E-TECH, a dual engine combining responsiveness, driving pleasure, and efficiency

The Renault E-TECH hybrid and plug-in hybrid engines were developed and patented by Renault Engineering. It is inherited from the EOLAB concept car, unveiled at the 2014 Paris Motor Show and benefits from the brands long term electric expertise. It uses parts designed within the Alliance, like its **new-generation 1.6-litre petrol engine** that has been reworked specifically for the occasion. It is joined by **two electric motors – one of which is HSG type (High-Voltage Starter Generator) – and an innovative multi-mode clutch less gearbox**. The association of both electric motors and the gearbox optimizes for smooth gear changes (the type of architecture that is known for better fuel efficiency and comes straight from the Renault F1 Team's vast experience).



Battery capacity varies according to the type of hybrid engine:

- **The New Clio E-TECH** has a 1.2 kWh battery (230V) that grants significant reductions in fuel use and CO₂ emissions, for up to 80% of urban driving time in 100% electric mode
- **The New Captur E-TECH Plug-in** has a 9.8 kWh battery (400V) that allows for up to 65 km in 100% electric mode in urban areas.

Responsiveness and energy optimisation

The combination of two electric motors, a multi-mode smart gearbox and a combustion motor offers a wide variety of drive modes:

- **A 100% electric start:** the fact the gearbox is clutch-free means the combustion motor is not utilised when starting the car; therefore, E-TECH hybrid vehicles are systematically started by the primary electric motor. A rather stylish solution as it immediately provides maximum torque for a particularly reactive start.
- **Automatic adaptation to driving situations:** Groupe Renault E-Tech technology is based on a series-parallel architecture allowing it to combine the advantages of the different types of hybridization possible (series, parallel and series-parallel). The engines can operate independently or in concert by directing their power to the wheels. The powertrain manages its engines and their supply according to acceleration and power requirements, as well as battery regeneration opportunities. This management is carried out according to 15 operating combinations between the various engines and the gears engaged on the gearbox

When in use, the **change from one mode to another is barely noticeable** and does not require any input from the driver. The E-TECH system automatically chooses the most appropriate mode for the situation in order to optimize emissions and fuel use, while guaranteeing responsive and enjoyable driving.

Energy regeneration and regenerative braking

At the same time, E-TECH technology optimises energy use while slowing and braking.

- **Battery regeneration while slowing:** When the driver lifts their foot off the accelerator pedal and the gear stick is in 'Drive', the primary electric motor functions as a generator that recovers kinetic energy produced by the deceleration and turns it into electrical energy that is sent back to the battery. To recover more energy, the gear stick can be put into 'Brake' (B) mode; in which case, the car slows down much faster.
- **Regenerative braking:** When the driver presses down on the brakes, the braking process is triggered electrically, with additional hydraulic braking power coming from the brake pads if necessary. Here, too, the electric motor provides additional braking, recovering excess energy and returning it to the battery – so much as the battery's storage capacity will allow.

All these features mean the Renault E-TECH and E-TECH Plug-in models are highly responsive for an improved driving pleasure, they optimise energy consumption, and provide optimal battery recharge features that engage while the car is slowing and braking, which makes for the best overall driving performance.

The first hybrid range with something for everyone, whatever their needs

In addition to Renault's B segment range of 100% electric and combustion engines, hybrid engines in the New Clio E-TECH and New Captur E-TECH Plug-in serve a variety of uses. Their availability on versatile "mid-range" vehicles means the electric-car experience is now more accessible than ever before. Many other hybrid vehicles follow.



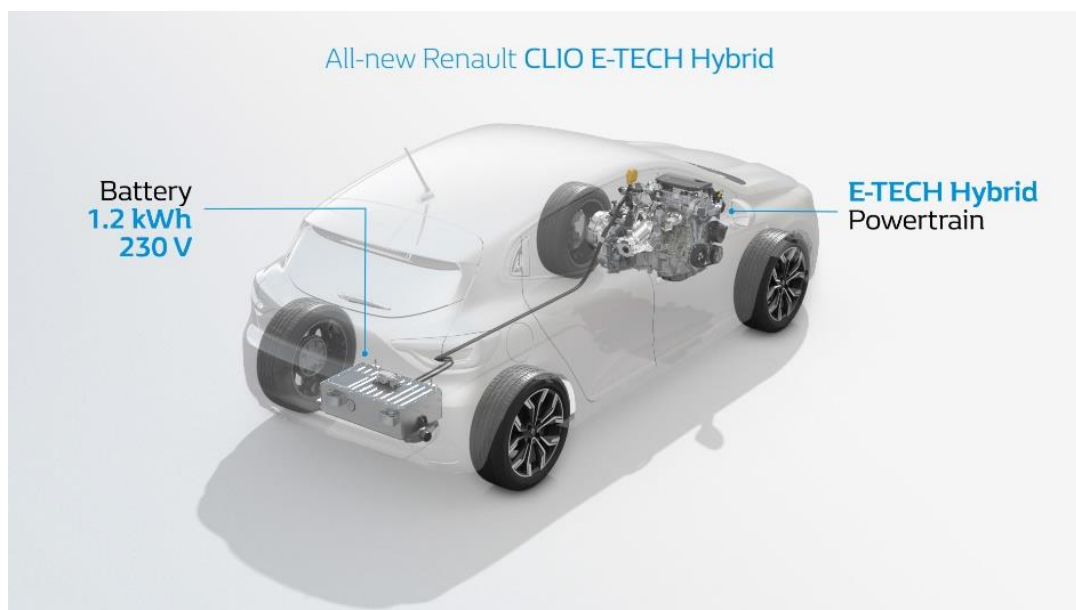
The best of the Clio range is now hybrid

The New Clio embodies Groupe Renault's vision of future mobility which is autonomous, electric, and connected. For example, it has one of the most modern and comprehensive driving assistance systems on the market, including the Highway and Traffic Jam Companion – a first step towards self-driving vehicles. Fitted with 9.3" screen and combined with the launch of the Renault EASY CONNECT connected offering, it also benefits from extensive multimedia extras.

Also, for the first time, the Clio range now comes with a 'full hybrid' E-TECH engine. In addition to motor engines, it is the perfect embodiment of synergies that lie at the heart of the strategy between Groupe Renault – pioneer and European leader in electric mobility – and its Alliance partners. Thanks to split-second responsiveness when starting and accelerating, it offers an experience and driving pleasure beyond compare with other hybrid city cars on the market.

Combine efficiency with driving pleasure

The hybrid engine on the New Clio E-TECH 140 hp offers maximum efficiency and unparalleled dynamic responsiveness when being driven; a success story marked by a jump from 80 to 120 kph in just 6.9s. Regenerative braking – like that of an electric vehicle – combined with the high battery charging capacity and efficiency of the E-TECH system help optimise energy. In fact, **80% of the time spent on city roads is in all-electric mode, for a consumption saving of up to 40% compared** with an internal combustion engine in the urban cycle. In all-electric mode, the New Clio can travel up to 70-75 kph.



All hybrid devices represent an additional weight of no more than 10 kilos compared to a dCi 115 engine. In mixed cycle, New Clio E-TECH is with CO₂ emissions less than 100g/km (WLTP values)². As such, it remains true to its 30-year long track record of being a versatile car.

Unique features for New Clio E-TECH

The exterior has a recognisable rear bumper and E-TECH badge located on the centre post as well as on the door of the boot. A 'Hybrid Blue' pack is also available to customise both the exterior and interior.



Inside the car, the 'Smart Cockpit' features a 7" TFT instrument cluster and the new Renault EASY LINK infotainment screen in either 7" (horizontal) or 9.3" (vertical). The new digital dashboard features a range of images and animations specific to hybrid; for example, they may indicate battery levels while charging or when the electric motor is in use.

² less than 90g (NEDC BT values) (subject to final confirmation)



In addition, the unique gear stick comes with an 'E-Tech' badge. Lastly, the Stop-and-Start button located under the media screen has been replaced by a model-specific 'EV' button that puts the car directly into electric mode – this requires the battery to be sufficiently charged.

The New Captur, electric on demand

A best-seller in its segment, both in France and Europe, the Captur has been a front-runner for the Renault range. Sold across all continents and in key markets such as China – where it is now industrialised for the local market – the New Captur builds on its previous success with a new technological edge. With its new E-TECH Plug-in hybrid engine, it also embodies the three pillars of the Groupe Renault's vision for future mobility: autonomous, connected and electric.



This engine will eventually be available from the intermediate finishing level of the New Captur range, after being launched on the higher finishing levels. Through a popular and iconic model and based on its expertise in electric mobility, Renault is democratizing plug-in hybrid technology to offer a unique driving experience accessible to all.

Maximum versatility

The E-TECH Plug-in 160 hp engine and its increased battery capacity (9.8 kWh and 400V) mean that the New Captur can run **at 100% electric for 50 kilometres** with a top speed of **135 kph in mixed use (WLTP) and 65 kilometres in urban use (WLTP City)**. The New Captur is of unprecedented versatility: it can run without using any fuel throughout the week for regular trips, then travel further afield on weekends or long holidays without having to worry about battery life. In order to maximize the range in electric mode, it is necessary to connect the vehicle regularly to recharge the battery. The new E-TECH Plug-in sensor otherwise functions as a "simple" (or standard) full hybrid E-TECH model, with all the advantages of this motorization.

The New Captur E-TECH Plug-in is fitted with a new MULTI-SENSE mode: 'PURE' mode. It is available on the screen settings or with a dedicated button. This mode forces the transition – if the battery has enough stock – to the electric driving mode.

It also has a special feature, available in **MULTI-SENSE 'SPORT' mode**. Under very specific conditions, if the battery has enough energy, and by fully depressing the accelerator pedal, **the three engines can work together thanks to the series-parallel architecture**. The vehicle can then tap into the powertrain's full potential; especially useful when overtaking, for example.

Another feature called 'E-Save', available in MULTI-SENSE, limits the use of the electric motor and draws power from the combustion motor, thereby saving battery power (at least 40%) allows driving electric whenever the driver wants for example, to drive into city centres.



Thanks to its unique battery capacity, its ability to continually regenerate energy, and its two electric motors, the New Captur makes the most of the E-TECH hybrid system's key assets: the systematic start-up in electric mode and reduced energy use.

In mixed cycle, the New Captur E-TECH Plug-In is expected to consume 1.5L/100km and emit 32 grams of CO₂/km with WLTP figures³ (32 grams with WLTP figures).

The New Captur E-TECH Plug-in comes with unique stylings

The New Captur E-TECH Plug-in draws on stylistic details that are specific to the hybrid range. 'E-Tech Plug-in Hybrid' logos are affixed to the door of the boot and centre post. The petrol tank is on the left-hand side of the vehicle; the charging socket, located on the right, which has a light that gives colour-coded information as to the state of the charging process: blue (charging), green (charged), orange (waiting), red (no charge).

³ less than 35g (NEDC BT values) (subject to final confirmation)



Inside, the seating remains unchanged with the rear seat still able to slide 16cm. A space under the hinged false floor allows to store charging cables without encroaching on the boot volume.



E-TECH markers are also located on the 'Smart Cockpit' and come with unique personalization elements and an 'E-TECH Plug-in Hybrid' badge on the gear stick. The Stop-and-Start button has been replaced by an 'EV' button to switch directly to 'PURE' mode while driving. The electric gear stick 'e-shifter' (no mechanical cables) comes with a 'Brake' function to get the most out of regenerative braking.

The New Captur E-TECH Plug-In now features two large screens: a 10.2" digital dashboard and a 9.3" Renault EASY LINK system multimedia display, from the third level of features. The two screens make it easier to understand and monitor the running of the active driving mode. The TFT instrument cluster comes with the option of displaying battery life, recharge time, flow exchanges, energy recovery and current charge level of the electric motor battery.

Similarly, different colours make it easy to know when the car is in different modes: green when driving on the electric motor and blue when regenerating power.

All energy use information is also available via the multimedia screen.

CMF-B: A Next-Generation Modular Platform

The New Captur E-TECH Plug-in and the New Clio E-TECH draw on the Alliance's new-generation modular platform: CMF-B. Development started in 2014 at the Guyancourt Technocentre, and it now features 85% of new parts compared to the platform used for the previous generation of Captur.

The new CMF-B modular platform provides both vehicles with many advantages. Its architecture is much lighter than the previous platform, especially for the body, axles, and bonnet. The base plated is lightly keeled, improving the car's aerodynamic performance by approximately 0.02 Cx. These two features ensure better fuel use and improved CO₂ emissions. Acoustic comfort is also greatly improved, thanks to sound proofing technology on the engine housing unit ensuring acoustic gains of 1.5 to 2dB between 0 and 130 km/h.

To offer the best in terms of safety, the CMF-B modular platform has an all-new body structure, spars, and apron, made possible thanks to the use of high elasticity steel and structural glue that strengthens inter-sheet bonding; thus ensuring the highest level of on-board safety for passengers. Safety is further enhanced by innovative equipment on the new CMF-B platform architecture: adaptive driver airbags, high-volume curtain airbags, seat belt pretensioners with stress limiters, new iSize compliant ISOFIX fasteners. The New Captur and the New Clio got 5 stars at Euro NCAP crash-test this year.

The new electrical and electronic architecture of the CMF-B modular platform means the New Clio and New Captur offer the most comprehensive and advanced modern equipment and driving assistance systems in their segment: the 360-degree camera and emergency automatic braking with cyclist and pedestrian detection, as well as Highway and Traffic Assistant (level 2 autonomy), which is a first for vehicles in the category. Lastly, the new platform was designed to convert vehicles into electric cars and thus made the addition of hybrid E-TECH and plug-in hybrid a reality.