ROAD TO iNEXT. BMW GROUP BOOSTS ELECTRIC MOBILITY.
FORMULA E: ONE OF THE FASTEST GROWING TOP RACE SERIES IN THE WORLD.

- World’s first FIA race series for fully electric cars.
- Season 4: 10 teams, 20 drivers, 40 cars (two drivers and four cars per team).
- Season 5: 11 teams, 22 drivers, 22 cars.

Growth of audience in Season 4: +48%
BMW i ENGAGEMENTS IN FORMULA E.

FORMULA E OFFICIAL VEHICLE PARTNER.

- BMW i was founding partner of the Formula E from Season 1 onwards.
- BMW i provides the Support Car Fleet for Formula E.
- Support cars include the i8 Safety Car, i3 Medical Car, i3 Race Control Car, Rescue Car.

BMW i ANDRETTI MOTORSPORT.

- BMW has now officially entered the racing series as manufacturer with its own race team “BMW i Andretti Motorsport” from Season 5 onwards.
- Race car: BMW iFE.18.
IN-HOUSE DEVELOPMENT PARTS OF BMW iFE.18.

UNITY PARTS (WHITE):
- Standard chassis: Spark Racing Technology
- High-Voltage Batteries: McLaren
- Tires: Michelin

BMW PARTS (BLUE):
- Power train
- Rear-end structure
- Rear suspension
- Shock absorber
- Power train cooling
- 12V Electrics
- Brake-by-Wire
- Software (on-car / off-car)
- Oil development (with Shell)

![Graph showing the weight distribution of various parts of the car, with a total weight of 107.9 kg.](https://example.com/graph.png)
FORMULA E – GEN2.
UNIQUE DESIGN AND EXCELLENT TECHNOLOGY.

KEY SPECS.

Max. Output Qualifying: 250 kW (335 HP)
Max. Power Race: 200 kW (270 HP)
Max. Speed: 240 km/h
Acceleration: 0-100 km/h in 2.8 seconds
Length: 5200 mm
Width: 1800 mm
Height: 1050 mm
Minimum weight: 900 kg (Battery 385 kg)

DESIGN FACTS.

The BMW Emblem as the colouring model of the entire design.

Elements of this year’s BMW M Motorsport Design also in BMW iFE.18.

Colour gradient from light- to dark blue shows movement and transition – Key topics of emobility.

The natural colours of pure electrification spread into a graphic network of blue and violet vanes.

In certain areas violet “synapses” appear at network-crossings. The closer those crossings are located next to the BMW i power train, the more these are visible.
TECHNOLOGY LAB FORMULA E. BMW iFE.18 COMPARED WITH BMW i3.

BMW iFE.18. E-Machine

<table>
<thead>
<tr>
<th>Performance</th>
<th>Volume</th>
<th>Weight</th>
</tr>
</thead>
<tbody>
<tr>
<td>+100%</td>
<td>-66%</td>
<td>-50%</td>
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</table>

BMW i3. E-Machine

100% BMW i3.
THE TRAIL OF SUCCESS OF E-MOBILITY IS IRREVERSIBLE.
BMW GROUP ELECTRIFICATION ROADMAP.

2013: Born electric.

By 2025:
25 electrified models
OUR FUTURE IS ELECTRIC.
AMBITIOUS TARGETS FOR SALES OF ELECTRIFIED VEHICLES.

17,800 2014
32,000 2015
62,000 2016
103,000 2017
142,600 2018
500,000 BY THE END OF 2019 ON THE ROAD

ELECTRICITY VEHICLES
PHEVS ARE KEY TO REDUCE CO2 EMISSIONS. NEW PHEV MODELS IN 2019.

13 PHEVs until 2025.

Electric range up to 75 km (WLTP)*.

Zero emission driving in urban areas.

Attractive model line-up.

*80 km (NEDC)
EMISSION-FREE DRIVING PLEASURE.

12 pure electric vehicles until 2025.

Range up to **600 km (WLTP)**.

Modular System Gen5 for all electrified models.

*partly Gen5
FLEXIBILITY IS THE KEY TO FULFIL OUR CUSTOMER NEEDS.

2018

Share BEV/PHEV

BEV

PHEV

↑ 25%

↓ 15%

2025
BMW i. FROM ‘BORN ELECTRIC’ TO A COMMON ARCHITECTURE FOR ANY TYPE OF POWERTRAIN.

2013
‘Born electric’

2021

One flexible architecture for all drive trains…

Combustion engine
Plug-In-Hybrid (PHEV)
Pure electric (BEV)
THE GEN5 MODULAR SYSTEM ENSURES THE IMPLEMENTATION OF THE DIFFERENT VEHICLE ARCHITECTURES.

**Combined Charging Unit (CCU).**
- 3.7 kW
- 22 kW

**Electric drive unit & hybrid transmission.**
- BEV ENTRY 90 kW
- BEV PERFORMANCE > 300 kW
- P2-PHEV Up to 150 kW

**Battery & battery cell.**
- Upright battery
- Flat battery

**Flexible modular system.** Scalable systems for different vehicle architectures.
ROADMAP E-DRIVE TRAIN OF BMW GROUP.
CREATING SYNERGIES.

2013:
- Efficiency: 97%
- Power Density: 2.01 kg
- Compactness: 23 kW/l

2015:
- Efficiency: 97%
- Power Density: 1.09 kg
- Compactness: 32 kW/l

2018:
- Efficiency: > 97%
- Power Density: > 15 kW/kg
- Compactness: > 63 kW/l

2021:
- Efficiency: 97%
- Power Density: 7.07 kW/kg
- Compactness: 60 kW/l

202x:
- Efficiency: 97%
- Power Density: 9 kW/kg
- Compactness: 10 kW/kg

Note: Power density regarding active material e-machine.
BMW IN-HOUSE DEVELOPMENT AND PRODUCTION OF BATTERY MODULES AND PACKS SINCE 2008. FULL COMPETENCE IN CELL DESIGN.

Development and Production In-house

Full Specification and Design Competence

xEV Vehicles → Battery → Battery subsystem/Module

- Battery cell
- Jelly Roll (electrodes)
- Subcomponents / Electrodes
  - anode
  - cathode
  - separator
BMW CONTINUOUSLY INCREASES CELL COMPETENCE TO ENHANCE THE LEVERAGE FOR REALIZATION OF CUSTOMER RELEVANT INNOVATIONS.

BMW Group Battery Cell Centre of Competence

Materials & Analytics

Securing Supply

Prototypes & Testing

... in combination with worldwide network
E-COMPONENTS PRODUCTION: PRODUCTION NETWORK ON THREE CONTINENTS WITH STRATEGIC EXPANSION.

**LANDSHUT**
- E-Machine BMW i3 and i8

**SPARTANBURG**
- Batteries for NAFTA

**MUNICH**
- Planning and technology development e-drive
  - Prototypes of electric motors, batteries, battery cells, fuel cells

**DINGOLFING**
- (Centre of Excellence E-Drive Production)
  - Batteries, E-Machines for plants (worldwide)

**RAYONG**
- (Partner plant)
  - Assembly PHEV Battery

**SHENYANG** (Joint Venture)
- Batteries for vehicle production in China
BMW iFE.18.
TECH LAB FOR iNEXT.

- Maximum efficiency.
- Maximum performance.
- Lightweight design.
- Minimum package.
- Robustness in extreme conditions.
- Latest technologies and materials.
- Know-how transfer series and motorsport.
HELLO SCIENCE. BYE FICTION.