THE FUTURE OF SUSTAINABLE MOBILITY. LEADING (E)-MOBILITY INTO A NEW ERA.
**BMW Group’s Efficient Dynamics Strategy.**

**TODAY**
- Optimisation of fuel consumption and emissions.
- Lightweight construction.

**TODAY**
- Full and mild hybrid vehicles.
- Initial step towards electrification of the drivetrain.
- Plug-in Hybrid drive-trains.

**NEAR FUTURE**
- First limited electric vehicle production in 2008.
- MINI E on the road since 2009.
- BMW ActiveE in 2011.
- Introduction BMW i3 in 2013.

**FUTURE**
- Commitment to and validation of technology.
- Focus on Crucial Components: Optimization of Powertrain Components (Fuel Cell and ICE).
- Improvement of hydrogen storage and efficiency.

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BMW Group’s drive strategy provides a **broad technology spectrum for today and the future.**

- **Combustion engine**
- **Hybrid technology**
- **E-vehicle**
- **Hydrogen**
In 2011, the BMW Group was ranked Supersector Leader in the Dow Jones Sustainability Index for the 7th time.
In the middle of 2007 the BMW Group established the strategy „Number One“. Consistent profitability, sustainable growth and securing the independence of the BMW Group are in the focus.

At the end of 2007 project i started with the mission to develop sustainable and visionary concepts for mobility.

The specific assignment was to develop new and trendsetting products, which fulfill the challenges and requirements of customers in an urban environment.

project i serves a think tank with the freedom of „lateral thinking“, however linked tightly with all departments of the BMW Group.

This results in new processes, new technologies, new vehicle concepts and a new approach to development, production and distribution.
SUSTAINABILITY DEFINES THE PRODUCT LIFE CYCLE.

<table>
<thead>
<tr>
<th>New vehicle concepts</th>
<th>New materials and recycling</th>
<th>Production concept of the future</th>
<th>New electric drivetrain</th>
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Integrated approach of project i

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<th>New processes</th>
<th>Employees</th>
<th>Pioneering design</th>
<th>New customers</th>
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</table>
EXPERT INTERVIEWS AND MARKET RESEARCH IN THE MEGA CITIES AROUND THE WORLD.
MINI E AND BMW ActiveE SERVE AS KEY LEARNING PROJECTS FOR THE BMW i3.

Use of renewable energy.
Market-potential.
Transfer scenarios.
User behaviour.
Acceptance.
Demands of e-infrastructure.
Strengths and weaknesses.

MINI E 2009
BMW ActiveE 2011
BMW i3 2013
# Overview of Scientific Projects with Leading Partners Worldwide

<table>
<thead>
<tr>
<th><strong>Government</strong></th>
<th><strong>Scientific monitoring</strong></th>
<th><strong>Field trial</strong></th>
<th><strong>Infrastructure and energy</strong></th>
</tr>
</thead>
</table>
| 🇩🇪 Bundesministerium für Umwelt, Naturschutz und Reaktorsicherheit | 🇬🇧 Oxford Brookes University | 50 Units, 40 Private / 10 Fleet | Vattenfall Scottish and Southern Energy Numerous energy partners State Grid, Southern Grid |}

- **Field trial**
  - 50 Units since 03/2011
  - 40 Units, 20 Private / 20 Fleet
  - 450 Units, 246 Private / 204 Fleet
  - 50 Units, 25 Private / 25 Fleet
  - 20 Units since 03/2011

1) Not included the MINI E field trial with Siemens and the SWM in Munich 09/2010.
THE BMW ActiveE, OUR NEXT STEP TOWARDS THE INTRODUCTION OF THE MEGACITY VEHICLE.

1 Lithium-Ion Battery.
2 Electric Engine.
3 Power Electronics.
The cost of conversion and the system-related extra weight of the electric drive unit lead to a considerable increase in weight.
The LifeDrive concept with aluminium chassis and CFRP passenger cell breaks the weight spiral for electric vehicles.

- Cost of conversion not an issue.
- System-related extra weight of the electric drive unit.
- LifeDrive concept with aluminium and CFRP offsets the extra weight of the electric drive unit.
- Comparable vehicle with combustion engine
- MCV electric vehicle
LIFEDRIVE ARCHITECTURE.
THE BMW i3 – OUR MEGACITY VEHICLE.

Vehicle
- Purpose Design
- LifeDrive lightweight concept
- 4-seater

Drivetrain
- Rear motor
- Rear wheel drive

Battery
- Lithium-Ion Battery
- Active cooling

Usable trunk space
THE BMW i8 – THE MOST PROGRESSIVE SPORTSCAR.

Vehicle
- Purpose Design sportscar
- LifeDrive lightweight concept

Drivetrain
- plug-in hybrid
- Electric motor
- Small combustion engine

Battery
- Lithium-Ion Battery
- Active Cooling

2+2 seats
GLOBAL WARMING POTENTIAL IN THE PRODUCT LIFE CYCLE SIGNIFICANTLY LOWER.

CO$_2$e

100%

66%

50%

BMW 118d

BMW i3 concept*

BMW i3 concept**

* EU 25 electricity mix

** Electricity from renewable sources
80% OF THE ALUMINIUM USED IS EITHER RECYCLED OR PRODUCED WITH RENEWABLE ENERGY.
25% of the weight of thermoplastics used is replaced by recycled/renewable raw materials.

- **Recycled materials**
  - Savings: 80 kg CO$_{2e}$

- **Renewable raw materials**
  - Savings: 40 kg CO$_{2e}$
50% LESS CO₂ (EQUIVALENT) EMISSIONS IN BMW i CFRP PRODUCTION COMPARED TO CONVENTIONAL CFRP PRODUCTION.

Sourcing
Precursor

Joint venture SGL ACF
Moses Lake
Carbon fibre
Wackersdorf
Fabric

BMW production network
Landshut and Leipzig
CFRP components
PRODUCTION OF BMW i MODELS IN LEIPZIG IS SETTING BENCHMARKS IN THE AUTOMOTIVE INDUSTRY.
THE SOCIAL ASPECTS OF SUSTAINABILITY WERE TAKEN INTO ACCOUNT AT AN EARLY STAGE OF PRODUCT DEVELOPMENT AND DESIGN.
The BMW Group and the joint venture set up with the SGL Group are investing a total of €530 million in the project. A total of over 1,000 jobs will be created as a result of this investment.

In the plant Moses Lake 100% hydro energy is applied. Leipzig provides the necessary energy for the CFRP fabrication in the plants Leipzig, Landshut and Wackersdorf by wind power.
THE CUSTOMER DEMANDS ON ELECTROMOBILITY REQUIRE MORE SOLUTIONS THAN JUST A CAR.
MOBILITY SERVICES.

BMW and MINI driver
Car driver
Mobile user

Car-dependent mobility Services
Car-related mobility services
Car-independent mobility services
MOBILITY SERVICES.

DriveNow
Premium car sharing independent of hire points

MyCityWay
Local real time information on cities

ParkatmyHouse
Marketplace for parking
THANK YOU VERY MUCH.