BRINGING A REVOLUTION TO LIFE.
BMW i INNOVATION DAYS 2013.

ENERGY AND RESPONSIBILITY.
SUSTAINABILITY PLAYS A MAIN ROLE FOR BMW GROUP – AND EVEN MORE SO FOR BMW i.

The BMW Group is the most sustainable company in the automotive industry.

Environment  Economy  Society
PRODUCTION CONCEPT DECISION BASED BOTH ON SUSTAINABILITY AND PROFITABILITY.

A. Sheet-metal body structure

B. Sheet-metal body structure optimized

C. Aluminium-Spaceframe; Thermoplast-Covering; painted

D. CFRP structure; Thermoplast-Covering; foiled without paint

PR = press shop
BS = body shop
PS = paint shop
AS = assembly
PA = assembly parts
DM = drive module
AL = aluminium structure
PL = plastic parts painted
CF = CFRP parts
PC = plastic cladding exterior
NEW PRODUCTION CONCEPT.
PRODUCTION OF BMW i MODELS IN LEIPZIG IS SETTING BENCHMARKS IN THE AUTOMOTIVE INDUSTRY.

- 50% energy
- 70% water
100% renewable energy
GLOBAL WARMING POTENTIAL IN THE PRODUCT LIFE CYCLE SIGNIFICANTLY LOWER.
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<th>BMW 118d</th>
<th>BMW i3 concept*</th>
<th>BMW i3 concept**</th>
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<td>CO$_2$e</td>
<td>100%</td>
<td>66%</td>
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* EU 25 electricity mix
** Electricity from renewable sources
50% LESS CO$_2$ (EQUIVALENT) EMISSIONS IN BMW i CFRP PRODUCTION COMPARED TO CONVENTIONAL CFRP PRODUCTION.
BMW PLANT LEIPZIG – BMW i PRODUCTION WITH WIND ENERGY.

100% GREEN ENERGY FOR BMW i PRODUCTION.

4 wind energy plant à 2,5 MW

Average energy output/ year: 26 GWh/ a

Hub height 140 m + blade length 50 m
Dr. Reithofer, Annual Press Conference
March 19, 2013

“We are revolutionizing how cars are made.“

– 100 % green energy

– LEED Gold Certificate
  (Leadership in Energy and Environmental Design)
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PRODUCTION.
RETHINKING THE WAY WE LAYOUT AND BUILD CARS. WHY?

- BMW typical handling and performance
- Clean Production
- Optimum integration of electric drive train
- Visionary design language
- More freedom in design features

LIFE DRIVE

- CFRP as an highly innovative technology
- Easy updates with evolving technologies
- Social sustainability
- Optimum safety concept for passengers and battery
CONVENTIONAL PRODUCTION CONCEPT.
NEW PRODUCTION CONCEPT.
BMW HAS MORE THAN 10 YEARS EXPERIENCE IN CARBON FIBRE PRODUCTION AND ASSEMBLY.

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<td>BMW i3 / i8</td>
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<td>BMW M3 CSL, 2003</td>
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<td>BMW M3, 2007</td>
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Mass production

Industrialisation

Implementation

Migration
BMW GROUP AND SGL ACF “OWN” ALL CFK PRODUCTION STEPS.

1. PAN Precursor
2. Oxidation Carbonization
3. Surface Treatment

- Cutting (Blanking in the tool)
- Tailoring (brining several individual preforms together)
- Resin Transfer Molding (resin injection)
- Machining (CNC/Water-Jet)

- Stacking (Build up of layers)
- Preforming
- Cutting (Blanking in the tool)

- Carbon Fibers (Spool)
- Recycled CFRP
- Non-Crimp fabrics (Rolls)

- PAN Precursor
- Oxidation Carbonization
- Surface Treatment

- PAN Precursor
- Oxidation Carbonization
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- PAN Precursor
- Oxidation Carbonization
- Surface Treatment

Moses Lake, USA  Wackersdorf, Germany  Landshut/Leipzig, Germany
THE MINI E AND BMW ACTIVEE SERVE AS KEY LEARNING PROJECTS FOR ELECTRIFIED SERIES PRODUCTS SUCH AS THE BMW i3.
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SAFETY AND SERVICE.
WHY LIFEDRIVE?

Many advantages
- Easy to create variants.
- Weight reduction by lightweight design.
- Specific structure to house the battery.
- Optimum integration of eDrive powertrain
- Low centre of gravity - good rollover resistance.
- Optimum safety concept.
FRONTAL IMPACT.

Impact energy is distributed optimally through the Drive and Life modules.

High-strength CFRP passenger cell remains almost free of deformation:
- Survival cell remains intact.
- Doors do not get jammed.

Rear-mounted motor allows low crash pulse and therefore low occupant loading in a frontal crash.
REAR IMPACT.

Impact energy is absorbed mainly by the Drive module.

Impact-resistant rear end structure protects high-voltage components.
Honeycomb-elements in the sill absorb the impact energy and divert it over the Drive module.

High-strength CFRP passenger cell allows major reduction in intrusion and therefore provides a good basis for occupant protection.
HIGH-VOLTAGE BATTERY (HVS) IMPACT.

Intrusion of pole is stopped before reaching the HVS.

Optimum position of the HVS outside the deformation zones.
“[we] had the opportunity to confirm in standardised cutting tests that the rescue of passengers from a crashed BMW i3 is similar to a conventional vehicle.”

Munich Municipal Fire Brigade, March 2013
SAFETY.

The BMW i safety is on eye-level with conventional BMW.
SERVICE.

The BMW i total repair costs will be on eye-level with conventional BMW.