Clean Vehicle Development at VW
Volkswagen Powertrain and Fuels Strategy

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Volkswagen Powertrain and Fuels Strategy
Coexistence of propulsion systems

- Coexistence of conventional powertrains and electrified mobility
- Decarbonisation of the energy carrier and higher powertrain efficiency
- A portfolio of various drivetrains will fulfil the customer expectations

CO₂ neutral and sustainable mobility
Volkswagen Group: Technologies to suit every need
Inter Urban Mobility
Measures to improve CO₂ efficiency

**Engine**
- Combustion system
  - High-performance combustion system
  - Combined turbo- and supercharging
  - Ignition systems
  - Variable valve train
  - Variable compression ratio
- Lightweight design
  - Alternative materials
  - Lightweight design through optimized structures
- Operational strategy
  - Active Cylinder Management
  - Optimizing engine mapping
  - Engine off while coasting
  - Downspeeding
  - NVH at low rpm
- Friction
  - Surface coating
  - Thermal management
  - Utilizing exhaust heat

**Gear box**
- Dual-clutch gearbox
  - Gear-ratio spread
  - Efficiency
  - Performance when pulling away
  - Low-rpm solution
Volkswagen Group: Technologies to suit every need
### Powertrains for the Modular Transverse Matrix (MQB)

<table>
<thead>
<tr>
<th>Conventional</th>
<th>Alternative / Regenerative</th>
<th>Electrified</th>
<th>Fuel Cell</th>
</tr>
</thead>
<tbody>
<tr>
<td>Diesel</td>
<td>Ethanol</td>
<td>Plug-In Hybrid</td>
<td></td>
</tr>
<tr>
<td>Gasoline</td>
<td>CNG</td>
<td>BEV</td>
<td></td>
</tr>
</tbody>
</table>

- Usage of powertrains via segments and brands
- More than 40 group products are based on the MQB assembly kit
Production Strategy – »Bumper on Bumper «
Thank You for your attention
Pathway to reduce Carbon dioxide

Technologies and energy sources

Fleet CO₂ emissions

- Technologies to increase CO₂ efficiency
- Optimizing conventional drive trains
- CO₂ efficiency measures in the vehicle
- Using alternative drive technologies
- Fuel cell

EU27 Fleet value in 2006: -166 g CO₂/km
EU27 Fleet value in 2012: -134 g CO₂/km
EU27 Fleet value in 2020: -95 g CO₂/km

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- TDI
- DSG
- TSI
- TGI
- BLUEMOTION
- g-tron
- e-hybrid
- TWIN DRIVE
- e.Motion
- e-tron

Fleet CO₂ emissions