Application for the approval of innovative technology pursuant to Article 12 of Regulation (EC) No 443/2009

Summary Information
Eco Innovation Coasting

1) Contact details
Applicant

| Applicants name: | Porsche AG |

2) Summary
Brief description of the innovative technology and its potential CO2 savings:

Coasting describes a driving mode in which a vehicle runs with a decoupled combustion engine (gear in neutral position), while the engine runs on idle, ensuring the function of the auxiliary equipment (generator, air-conditioning compressor, water pump, steering pump).
While coasting, the kinetic and potential energy of the vehicle is used directly to overcome the driving resistance. During overrun condition with overrun fuel cutoff, there is no fuel consumption, but the vehicle brakes stronger due to engine drag. If no deceleration is wanted, the lost distance has to be travelled with additional fuel deployment afterwards.
Combined with an automatic gear box, coasting can be used to decrease the fuel consumption by using an intelligent control strategy.

3) Innovativeness
Market penetration of the new technology based on the reference year 2009:

Based on the current knowledge, the following vehicles have been offered worldwide with the coasting function:
- 30,000 units VW Lupo 3L were built from 1999 until 2005.
- 6500 units Audi A2 3L were built from 2001 until 2005.
The production both vehicles was stopped in mid-2005.
The number of new car registrations in Europe in 2009 was about 14 million vehicles. Therefore the market penetration of the vehicles with coasting function falls below the limit of 3% significantly.
4) **Necessity**
Information whether the innovative technology is intrinsic to the efficient operation in terms of performance and/or safety of the vehicle:

Coasting helps saving fuel under real world conditions. The engine speed and the braking effect of the power train are determining factors for CO₂ emissions of a vehicle. The coasting function optimizes the influence of this factors for reducing CO₂ emissions.

5) **Measurement methodology**
Description of the measurement methodology or reference to a methodology set out in the Technical Guidelines.

1. **Preconditioning of the vehicle:**
One complete test cycle is performed to reach the standard hot testing conditions of engine and battery with regard to temperatures.

2. **Definition of the coast down curve:**
The determination of the coast down curve in coasting mode is carried out on a single-roll dynamometer as described in the following steps:
- Determination of the dynamometer road load according to the standard operating procedures.
- Bringing the car to operating temperature using the preconditioning procedure.
- Execution of a coast down in coasting mode from 120 km/h to the lowest possible coasting speed.

3. **Generation of the modified NEDC profile:**
- The test sequence is composed of an urban cycle made of four elementary urban cycle and an extra-urban cycle.
- All acceleration ramps are identical to the NEDC-profile.
- All constant speed levels are identical to the NEDC-profile. The minimal time after each acceleration phase is 2 seconds.
- The deceleration within deceleration phases is equal to the ones within the NEDC-profile.
- The speed and time tolerances are in accordance with paragraph 1.4 of Annex 7 to UN/ECE Regulation No. 101.

4. **Constraints:**
- The distance at the end of each sub-elementary phases of the mNEDC-profile are equal to the distances of each sub-elementary phases of the NEDC-profile.
- Where the NEDC profile allows for multiple coasting curve solutions, the overall distance complies with the NEDC tolerances.
- For all phases of acceleration, constant velocity and deceleration, standard NEDC tolerances are applied.