Call for application for research scholarships

for post-graduate international candidates

RESEARCH PROJECT N. 67

Title

Urban policies concerning pollution and road traffic constraints based on new powertrains and the use of ITS.

Scientific responsible (name, surname, role)

Prof. Bruno DALLA CHIARA, Associate Professor in Transport systems, Dept. DIATI (contact person for this proposal) (bruno.dallachiara@polito.it)

Short description of the research activity (max 250 words)

In recent years, local authorities have been developing measures in order to limit road traffic in cities, with various constraints, mainly environmentally oriented. This is especially due to high levels of pollution, as well as the European targets regarding environmental impact of ICEs – *Internal Combustion Engines* – (95 gCO_2/km at 2020[1]), energy consumption and concentration limits in urban contexts. Bearing this in mind, opting for a private transport has become a more complex decision. The light duty vehicles are responsible for 13,5% of global CO_2 emissions and considering extraction and supply chain the percentage reached 15%[2].Car makers could find it difficult to satisfy both environmental constraints imposed by European Community (Regulation (CE) n. 443/2009 and modification n. 333/2014) and the new homologation test cycle WLTP that is in function since 2017 only in traditional engines. In particular, the European target for 2020 is stated for 95 grams of CO_2 per kilometre for passenger cars

Recently, the automotive field is undergoing technological innovations due to some aspects, such as: complex environmental dynamics, better user safety and economy savings, both for car makers and customers.

Recent events confirm that the automotive field must make a change, because old policies have to be up to date with current time. To justify the issuance of new standards, some key events are occurring in various part of the world, such as the traffic restrictions applied in a lot of cities in order to reduce air pollution, the scandal of “Diesel Gate” in USA and the European adoption of a new vehicle homologation cycle WLTP (Worldwide Harmonized Light–Duty Vehicles Test Procedure) instead of NEDC (*New European Driving Cycle*) considered to have discrepancies over the reality.

The main purpose of this research is to correlate possible decisions on urban policies and those on the new powertrains and consequent levels of pollution in urban contexts. In addition, the second target of the study is to understand whether new automotive technologies can be able to satisfy user demand and urban policies in relation to the traction technologies or powertrains for the future mobility, indicating the necessary ITS to support such policies.

[1] Source (European Commission, Horizon Program 2020): https://ec.europa.eu/programmes/horizon2020/en/what–horizon–2020

[2] Source: European Commission Press Release “Further CO_2 emission reductions from cars and vans: a win–win for the climate, consumers, innovation and jobs”, Brussels, 11 July 2012. (Online: http://europa.eu/rapid/press–release_IP–12–771_en.htm)

Specific requirements (experiences, skills)

Preferably Master degree dealing with transport systems, powertrains, traffic engineering, environmental studies.

Skills on at least one of the following topics are sought:

- Traffic engineering
- Powertrains for automobiles
- Quantitative studies on pollution
- Econometric models to characterize the travel demand

Previous research experience in any of the above topics is also appreciated.

Website of the research group (if any)

http://www.poloautomotive.eu/tag/ezio-spessa/

http://www.diati.polito.it/en/the_department/internal_structures/laboratories/transport_engineering

http://www.transport-systems.com/contents.html

Keywords (min 3, max 6)

Urban pollution, new powertrains, ITS, traffic policies.

Research Area (max 1)

Energy