In consideration of the determination of the Regione Piemonte – Direzione Coesione sociale No. 372 of 8/6/2020 which approved the following apprenticeship position for the PhD project proposal submitted by the Politecnico di Torino in the framework of a specific regional call for proposals (Apprendistato di Alta Formazione e Ricerca 2016-2018 - Avviso Pubblico per la realizzazione dei percorsi formativi di: Laurea triennale e magistrale, Diploma Accademico di primo e secondo livello, Master di primo e secondo livello Universitario, Dottorato di ricerca e Diploma accademico di formazione alla ricerca, Attività di ricerca approvato con Determinazione 537 del 3/8/2016 e s.m.i):

**PhD in Energetics**

**Research project “Soluzioni di intelligenza artificiale in ambito automotive”**

Politecnico di Torino – Addfor S.p.A.

<table>
<thead>
<tr>
<th>Supervisor</th>
<th>Prof.ssa Daniela Misul – Politecnico di Torino <a href="mailto:daniela.misul@polito.it">daniela.misul@polito.it</a> Marco Fainello – Addfor <a href="mailto:marco.fainello@add-for.com">marco.fainello@add-for.com</a></th>
</tr>
</thead>
<tbody>
<tr>
<td>Contact</td>
<td><a href="http://www.pt-erc.polito.it/">http://www.pt-erc.polito.it/</a> <a href="http://www.add-for.com">www.add-for.com</a></td>
</tr>
<tr>
<td>Context of the research activity</td>
<td>The project stems from the cooperation between Politecnico di Torino and Addfor S.P.A. and will allow the company to hire the candidate with a contract of high apprenticeship accordingly to art. 45 of the D. Lgs. 81/2015. The project aims at developing solutions for the control and management of electric powertrain as well as of their integration into the existing infrastructure. The goal is set on the achievement</td>
</tr>
</tbody>
</table>
of solution for a sustainable mobility with specific attention to drivability, safety as well as comfort with specific reference to the considered driving mission (V2X). The goal is to be fulfilled exploiting artificial intelligence (AI) techniques also based on the automatic learning.

The candidate will develop competences into the application of machine learning and neural network algorithms in the automotive field. More specifically, he/she will deepen his/her knowledge on the followings:

- analysis of on-board sensors (OBD) with techniques in the time and frequency domain aimed at the developing of virtual sensors;
- supervised and unsupervised learning techniques in the automotive field;
- development and application of dedicated algorithms for the processing of signals to be integrated into the vehicle mission.

The main objective of the present PhD program is that of developing solution for the control and management of electric and hybrid powertrain. The project also aims at integrating these latter in the infrastructures so as to attain a sustainable mobility and a connection to other vehicles and to feedback from the cloud (V2X). Attention is to be paid to drivability, safety as well as driver comfort.

The program hence aims at developing dedicated solution for the above mentioned powertrains and for their integration into the current infrastructure by means of AI solutions.

The candidate shall be less than 30 years old at the moment of the hiring from the company.

The candidate should be able to assess for the current state of the art in the technologies and methodologies within the AI and automotive context so as to develop dedicated code and algorithms. Moreover, he/she should possess horizontal
competences in the automotive field as well as in the design of hybrid powertrain. Such skills should be conveniently integrated to a basic knowledge of Machine Learning and Deep Learning solutions.