EASY-PV: RPAS and Galileo to support photovoltaic plants monitoring
Tor Vergata, Rome, November 27th 2017, Aula Leonardo

09.15 **Welcome**
Ing. Carla Cappiello, Presidente dell'Ordine degli Ingegneri della Provincia di Roma
Ing. Francesco Marinuzzi, Consigliere dell'Ordine degli Ingegneri della Provincia di Roma
Prof.ssa Ernestina Cianca, University of Rome Tor Vergata
Ing. Marco Nisi, Head of Integrated GNSS solutions, Sistematica S.p.A.

09.45 **RPAS CC&C Link versus Satellite and 5G Network**
Ing. Giuseppe De Franco, Vice-Presidente Commissione Aerospazio dell'ordine degli Ingegneri della provincia di Roma

10.15 **Why RPAS, Galileo and computer vision for photovoltaic plants maintenance?**
Ing. Marco Nisi, Head of Integrated GNSS solutions, Sistematica S.p.A.

10.45 **Galileo: system and applications**
Ing. Marco Lisi, ESA chief technical advisor to GSA

11.15 *Coffee Break*

11.30 **GNSS to support surveying and mapping applications**
Prof.ssa Ernestina Cianca, University of Rome Tor Vergata

12.00 **Computer vision to support thermal images analysis**
Prof. Mario Luca Bernardi, University of Giustino Fortunato

12.30 **EASY PV architectural solution**
Ing. Alberto Mennella, Co-founder of Topview s.r.l.

13.00 **Lunch break**

14.00 **EASY PV Maintenance Operational Concepts**
Ing. Davide Marenchino, Technical Area responsible, ENTEC S.p.A.

14.30 **RPAS Regulatory framework**
Dott. Damiano Taurino, R&D manager, Deep Blue s.r.l.
Davide Savastano, Segretario generale FIAPR Italia

16.00 **Q&As**

16.30 **Meeting conclusion**

La partecipazione rilascia n. 6 CFP agli iscritti all'Ordine degli Ingegneri ai fini dell'aggiornamento delle competenze professionali ex DPR 137/2012 e successivo regolamento approvato dal Ministero della Giustizia.

Abstract

RPASs are used in many areas and what's more, there is no end when it comes to their possibilities. Therefore, the areas of applications are numerous today and there is the growing use of RPASs all around the world. As a general non exhaustive list main areas of applications may be Search and rescue, security operations, surveying and GIS (mapping), Aerial photography & video, unmanned cargo systems, engineering, construction and pre-construction work, aviation, maritime, marketing, real estate, insurance, utilities, mining, meteorology, education, and more.

A really promising sector is without a doubt relevant to inspections activities as many systems such as power lines, wind turbines, and pipelines can be checked in a short time. In particular, a service which is recently emerging refers to photovoltaic plants maintenance operations.

As photovoltaic plants are aging, it is not uncommon that their production lowers due to inefficiency caused by unknown modules on the plant lowering the whole plant's productivity. Thermal inspections are valuable for PV owners and maintainers, but relevant procedures - currently performed by operators with handheld cameras - are time demanding and sometimes expensive due to safety costs for the personnel involved in the operations. It stands to reason that today such operations are not fully automated yet and the responsive recognition of a broken module might result very difficult in a large PV plant.

As a direct response to the growing need expressed by PV plants owners and maintainers, EASY PV solution is conceived to build up an automatic system for acquiring, geo-referencing and processing both visible and thermal images captured by an RPAS equipped with an EGNSS high accuracy receiver, flying over a photovoltaic field. A proprietary computer vison algorithm automatically processes thermal geo-referenced images allowing to easily detect the defective modules to be contingently replaced.

This seminar, conceived having in mind the above scenario, aims to reach people enthusiast for RPAS and potentially interested to collaborate with the EASY-PV consortium providing them with a technological insight about enabling technologies such as GNSS and computer vision as well as operational concept to be managed to accomplish photovoltaic plants' maintenance activities. Moreover, an important section is devoted to the regulatory framework, necessarily to be handled due to RPAS involvement in operational activities.