



AVVISO DI SEMINARIO

Il giorno 16 luglio 2019 alle ore 15:30

nell'Aula Seminari del Dipartimento di Scienze e
Tecnologie Chimiche

Il Professor Koichi Yamada

Center for Low Carbon Society Strategy, Japan Science and
Technology Agency & University of Tokyo

Terrà un seminario dal titolo:

**Technology evaluation of zero-carbon power
generation systems in Japan in terms of cost and
CO₂ emissions**

Proponente: Prof. Silvia Licoccia

Abstract:

To realize a low-carbon society, one of the important issues is to establish a zero carbon power system. In this paper, we identified the issues that need to be addressed to construct a zero-carbon power system in Japan, taking into consideration the future technology development of each renewable energy and battery storage system, and stabilization of the power grid. First, based on the estimation of future technology development, we constructed technology scenarios using the manufacturing technology database developed by the Center for Low Carbon Society Strategy (LCS). Second, the power system was evaluated using the optimal multi-region power generation model of cost minimization, considering system stability under various constraint assumptions such as, CO₂ emissions reduction rate, power demand, the technology level of renewable energy and storage systems, reinforcement of the transmission grid and grid stability constraints. We found that, in addition to the limitations imposed by the technological development of renewable energy, grid enhancement and the system stability constraint have the greatest influence on power generation cost to achieve a zero-carbon power system. Furthermore, it was shown that, as the demand for electricity increases, it becomes difficult to achieve zero emissions, and the development of renewable energy technologies that contribute to system stability such as hot dry rock geothermal energy becomes important.