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Public Lecture



Prof. Neven Duic

Professor, Energy Planning, Policy and Economics

Chair, Power Engineering and Energy Management, University of Zagreb, Croatia

“EU Energy Policy and Smart Energy Systems”

Wednesday, March 25, 2015, at 3:30 PM

Conference Room - Building D

Abstract

European Union has under pressure of security of energy supply and global warming started energy transition towards sustainable energy sources. Transition of energy systems to energy sources with lower environmental impact is becoming more attractive with fall of investment costs of renewables and volatile prices and political insecurity of fossil fuels. The resources are bountiful, especially wind and solar, while biomass, hydro and geothermal are limited and not necessarily found everywhere. Meanwhile, integrating them into current energy systems is proving to be a challenge. The limit of cheap and easy integration for wind is 20% of yearly electricity generation, while a combined wind and solar may reach 30%. Going any further asks for implementation of really free energy markets (involving day ahead, intraday and various reserve and ancillary services markets), and it involves integration between electricity, heat, water and transport systems. The cheapest and simplest way of increasing further the penetration of renewables is integrating power and heat systems through the use of district heating and cooling (which may be centrally controlled and may have significant heat storage capacity). In countries with low heat demand water supply system may be used to increase the penetration of renewables, by using water at higher potential energy as storage media, or in dry climates desalination and stored water may be used for those purposes, and reversible hydro may be used as balancing technology. Electrification of personal car transport allows not only for huge increase of energy efficiency, but also, electric cars due to low daily use may be excellent for demand side management and even storage potential. That will allow reaching 80% renewable in energy system, but the remaining 20% may be more an uphill battle without technology breakthrough. Long haul freight road transport, aviation and ship transport, as well as high temperature industrial processes, cannot be easily electrified. Biomass, if not used for producing electricity and heat, may cover half of those needs, but the rest will have to come from some other technology. On the way towards sustainable energy sources EU will still need to import fossil fuels for long time, gas being most important transitional resources.

About the Speaker

Prof. Neven Duic is a Professor in Energy Planning, Policy and Economics since 2001, Power Engineering and Energy Management Chair, Department of Energy, Power Engineering and Environment, Faculty of Mechanical Engineering and Naval Architecture, University of Zagreb. He is member of International Scientific Committee of Dubrovnik Conference on Energy, Water and Environment Systems since 2003 and chair of its Local Organising Committee since 2007. He is co-Editor of Energy Conversion and Management, subject Editor of Energy, Editorial Board member of Applied Energy, member of regional editorial board of Thermal Science Journal and Editor-in-Chief of Journal of Sustainable Development of Energy, Water and Environment Systems. His research covers areas of energy planning of energy systems with high penetration of renewables, sustainable communities, energy policy, energy economics, mitigation of climate change, energy efficiency and combustion engineering.