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# GREEN ENERGY

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## Peter Novak

*Faculty for Technologies and Systems, Novo mesto, Slovenia*

### Exergy and sustainable renewable energy system with chemical storage

Quality measure of energy is exergy. Amount of exergy in energy carriers is very different and prices include value of quantity and not of the energy quality. Exergy is a measure for quality of energy, because the only part of energy available to do work is exergy. Transition to a sustainable energy system, without GHG emissions, based on RE, opens the questions how to evaluate exergy from solar energy. Solar energy in all forms (irradiation, water flows, wind, and biomass) consists of nearly 100% of exergy. Solar energy is free, conversion systems are not. To exploit maximum the present infrastructure, there is a common agreement that we need a sustainable energy system with four main energy carriers: electricity, gaseous, liquid and solid fuels. Our vision is the new Sustainable Energy System (SES) based on the biomass carbon recycling using solar and planetary energy for electricity and hydrogen production. SES is based on the existing infrastructure and known chemical processes. With regards to availability of renewable energy resources (RES) it is unrestricted in comparison to present fossil fuels use. The proposed SES consists of the three main energy carriers: electricity, synthetic methane ( $\text{CH}_4$ ) and synthetic methanol ( $\text{CH}_3\text{OH}$ ). The last two present also the chemical storage of solar energy.

### Biography

Peter Novak completed his PhD degree in Technical Sciences, University of Belgrade in 1975. He was Professor for HVAC, Renewable Energy and Environment and Dean at Faculty of Mechanical Engineering, University of Ljubljana. He is Professor Emeritus of Faculty for Technology and Systems, Novo Mesto. He is the Owner of consultant company, Energotech. At present, he is involved in preparation of energy concept of Slovenia for Slovenian government. He is associated with ASHRAE (Fellow and Life Member). In the International Institute of Refrigeration, he served eight years as President of Commission E1 for Air Conditioning (now Honorary Member of IIR) and past-Vice Chairman of Scientific Committee at European Environmental Agency, Copenhagen (2012-2016). He is also Honorary Member of REHVA, SLOSE, and SITHOK. More than twelve years, he served as Member of Environmental Council of Slovenia.

[peter.novak@energotech.si](mailto:peter.novak@energotech.si)

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