NEO CARBON ENERGY

TRUST IN RENEWABLE.

Key takeaways to EU policymakers

NEO-CARBON ERA – RENEWABLE ENERGY SOLUTIONS FOR IMPLEMENTATION OF THE PARIS AGREEMENT AND THE ENERGY UNION

To meet the Paris Climate Agreement targets, EU needs to transform its energy systems to emission-free by 2050. Simultaneously Energy Union sets EU to regain its position as the global leader in renewables.

Transition to 100% renewable energy system (Neo-Carbon era) is technologically possible today, but three trends of exponential change need urgent attention from policy-makers. **This abstract sums up the key messages - "Emission free energy system is possible – now"** that should be taken into consideration in developing the Energy Union.

1. Disruption of current energy system leads to great electrification and Internet of Energy

Energy system disruption takes place both at the level of individual technologies and at systemic level. Building an emission-free energy system will lead to great electrification of society with systemic energy efficiency improvements. At the technologies level it leads e.g. to the uptake of electric mobility and rollout of decentralised renewable electricity generation gradually replacing centralised power plants. At the systemic level internet connection of home appliances enables decentralisation. The result is best described as the Internet of Energy, where all electricity users will be connected to one energy efficient system where electricity is traded in real time.

2. Future energy security is a cybersecurity challenge

Under the Paris climate agreement, the role of oil, coal and gas markets will diminish and energy independence increases by decentralised renewable energy systems. Global transition to renewables therefore disrupts the current inter-dependencies and power balance between nations and regions. Deconstruction of the current global income distribution framework, i.e. the fossil fuel market, will cause political unrest. In the Internet of Energy, energy security becomes primarily a cybersecurity challenge. If carbon is still needed in the post fossil world e.g. for materials, chemicals or fuels, it can be sourced from airborne carbon dioxide. The Soletair technology demonstrates how air and electricity can produce Neo-Carbon fuels and materials everywhere.

3. Future energy market is electricity market

Fossil fuels will cease to set energy prices under the Paris agreement because they are being phased out. Energy markets need to reinvent price setting, as the future energy market will be near zero marginal cost system. The renewable energy production capacity has predominantly capital costs (CAPEX), but very low marginal production costs (OPEX). Therefore, the cost of electricity will ultimately depend on the finance and the cost of capital. Therefore, in the future access to capital and a secure investment climate will be more critical than access to fossil (material) resources.

Neo-Carbon Energy (NCE) is the largest ever renewable energy research project conducted in Finland. NCE want to contribute with pilot solutions and experimental evidence to debates on how the current EU strategies take these three energy trends into account.

Contact:
Dir. Pasi Vainikka. Tel.: +358 40 5825 987 Twitter: @VainikkaPMJ
Neo-Carbon Energy research: www.neocarbonenergy.fi Twitter: @neocarbonenergy

NEO-CARBON ENERGY project is one of the Tekes strategic research openings and the project is carried out in cooperation with Technical Research Centre of Finland VTT Ltd, Lappeenranta University of Technology LUT, and University of Turku, Finland Futures Research Centre FFRC.