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This study investigates the relationship between the nuclear power proportion and CO2emissions per capita using the panel dynamic ordinary least square method. The panel datasets consist of 18 countries covering 95% of the global nuclear reactors. The results indicate that a long-term1% increase in nuclear power led to a 0.26–0.32% decrease in CO2emissions per capita. Additionally, in France, Germany, and Switzerland they demonstrate the existence of the environmental Kuznets curve—an inverted U-shaped relationship between environmental pollution and income per capita.

Nuclear power is an important means of reducing greenhouse gas emissions. The International Energy agency (IEA) [1] proposes reduction measures such as demand management, energy efﬁciency improvement, carbon capture and storage, new and renewable energy, and nuclear power to hold the increase in global temperature below 2◦C above the pre-industrial level. It predicts that nuclear power use will increase to account for 15% of all annual greenhouse gas reductions by 2050.The Intergovernmental Panel on Climate Change [2] also highlights the beneﬁt of nuclear power over other energy sources in terms of greenhouse gas emissions. It estimates the CO2emissions coefficient nuclear power over its life cycle as 12 tCO2/GWh, which represents a 40-fold reduction from the emissions coefﬁcient of liqueﬁed natural gas at 490 tCO2/GWh and a 68-fold reduction over that of coal at 820 tCO2/GWh. The International Atomic Energy Agency (IAEA) [3] emphasizes the role of nuclear power in achieving sustainable development and mitigating CO2emissions in developing countries. IAEA [4] further presents the contribution of nuclear power to CO2mitigation by showing that over the period 1970–2013, hydropower avoided 87 Gt CO2, nuclear power avoided 66 Gt CO2,and other renewables avoided 10 Gt CO2, respectively. Recently, several studies attempted to investigate the relationship between nuclear power andCO2emissions in the context of the environmental Kuznets curve (EKC) framework [5–7]. The original hypothesis presumes an inverse U-shaped relationship between environmental pollution and income per capita (we refer readers to Kaika and Zervas [8] for an extensive overview of this topic).According to this hypothesis, the deterioration of the environment increases with income per capita during the initial stages of economic growth, but decreases with income per capita after arriving at ascertain turning point. Research shows that the EKC hypothesis is explained through three channels: scale effect, composition effect, and technique effect [9]. Holding other effects constant, the scale effect is that emissions tend to rise proportionally as the scale of economic activity increases; the composition effect is that emissions can fall if an economy transits toward producing a set of goods that are cleaner and less polluting; the technique effect is that emissions can fall as cleaner techniques Sustainability 2017,9, 1428; doi:10.3390/su9081428 www.mdpi.com/journal/sustainability

Sustainability 2017,9, 1428 2 of 13substitute for dirtier ones in the production of goods. Understandably, the EKC hypothesis can be accounted for with some mixture of scale, composition, and technique effects. The empirical evidence for this hypothesis is mixed at best, according to the estimation method, the data time periods and types, and the characteristics of countries

Due to the depletion of fossil fuels and the degradation of the ecological balance, the transition of mobility to new ways of propelling means of transportation is one of the toughest themes of sustainability, debated as such and by scientific research. At the same time technological research has already proposed several forms of vehicle powering and the manufacturers have even offered the market a significant number of electrically propelled vehicles - the option with the greatest technical and economic potential for everything that will mean future transportation of people and freight. Unfortunately, the development of electrical mobility to its quasi-state is dependent on increasing the capacity of supplying enough electricity from the power industry. The objective of our study is to develop a model for the utilization of nuclear energy in view of the global expansion of e-mobility applications. In the context of increased demand for electricity - due to new e-mobility technologies and applications, nuclear power can become the most efficient and constant form of electricity generation. The research methodology is based on qualitative analyzes of new e-mobility applications and their diversification tendencies, but also on quantitative analysis based on a specialized questionnaire. The novelty of the research finds its exemplification in attempts to explain the importance of nuclear energy in the new context of climate change and at the same time proposing a hypothesis regarding the possible maintenance and / or refurbishment of nuclear power plants.

Energy is a resource on which civil society is built. It affects every aspect of life and is vital to the survival of the modern world. This paper explores nuclear power and the effects it has on a national and global scale. The research looks at both the positive and negative aspects of nuclear energy, giving weight to both sides of the argument to present a detailed look at this resource. The research is compiled from a wide range of authors from scientists and nuclear experts to reporters and strategic intelligence agents. A proposed technology for the advancement of nuclear energy is also examined to show its benefits and compare it to conventional nuclear energy. This paper will assist any concerned citizen in making an informed decision on the world’s most vital resource, energy.