Chapter 11
Cost-Effective Sustainable Energy Solutions for Turkey:
AI Driven Renewables

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ABSTRACT

Artificial intelligence (AI) is an essential high value technology that upgrades science globally increasing wealth and decreasing costs. Intersection of renewable energy and AI can lead to great achievement and progress for global eco-efficiency enhancing and widespreading alternative sources of energy all over the world. By all means, there is considerable energy investments combined with AI in the eco-efficient countries. However, AI global readiness is still not enough. Interestingly, Turkey's adaptation of AI level is even better than the renewable energy dependency rank by prolonged practices of renewables. Turkey is still far beyond the desired level of eco-efficiency and affordable energy. After all, economic disruption deepened in Turkey since pandemic, with huge corporate debts worsening financial situation and decreasing investments that unfortunately affect both AI and any type of renewable energy projects. This study emphasizes the great potential of renewables in Turkey and yet needs transformation by the help of AI driven projects.

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INTRODUCTION

Artificial intelligence (AI) increased the potential solutions for decreasing costs and especially considering energy research and development. Tendency of sophisticated high technology and AI can eliminate the unsolved disadvantages of renewable energy so that the clean energy solutions conquer the earth hopefully. AI should be the source of elavating investments in the the long run for cost-effective sustainable and infinite energy.

As ecological technology improves every day and advanced engineering leads energy science, improvements expand opportunities for carbon reductions. Ecoefficient countries put so much effort to enhance energy investments combined with AI. Experts say smart systems, as playing a distinctive role in the future process of greening cities, will handle increasing amounts of variable renewable energy from local sources, incorporate local energy storage, and provide greater flexibility, efficiency, and transparency in the power distribution grid all by the help of new technologies mainly the AI. Nevertheless, the index- AI global readiness- shows that AI is not yet widespread in the world (Oxford Insights, 2023).

EU 2030 digital compass policy advises for emhancing AI based practices in every field. United Kingdom announced a progressive inactment for AI strategy in 2021 (EU, 2021). USA inacted National AI R&D Strategic Plan in 2023, which follows national AI R&D strategic plans issued in 2016 and 2019, reaffirming strategies and adds a ninth one to underscore a principled and coordinated approach to international collaboration in AI research (NITRD, 2023).

On the other hand, the second division of this study -energy and the future of energy - seems uncertain but can be predicted and AI is a powerful solution. The range of possible future energy solutions become greater and so does the uncertainty. As long as the technology enables favorable outcomes, the global energy policy is to bring energy use and carbon emissions to decline 70% below today's levels, in 2050 according to International Renewable Energy Agency (IRENA, 2019). Furthermore, natural sources of energy like wind, hydro, solar, geothermal, biomass, and biofuel is cheap and clean for protecting earth and acquiring sustainable clean environment. In the last decade, high energy prices and shortages grew fast as global demand increases enormously. Understanding the benefits of natural energy sources, countries are forced to work on legislature to provide incentives for and renewable energy based on new technologies.

This study finally addresses solutions for Turkey, specifically. Turkey has a considerable potential for a sustainable, creative and cheap form of future energy. But there is a sign of incompetence in policy making which challenges renewable energy utilization in Turkey. Nowadays, renewable energy is widely accepted with the crucial benefits of environmental protection and reduction of carbon emissions.

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