Chapter 1

Urbanization Dynamics and Green Energy Demand

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Abstract

Urbanization stands out as a decisive factor in the economic, social, and environmental transformation of modern societies. The process of urbanization, accelerated by industrialization, population growth, and technological developments, has led to a significant increase in energy demand and increased fossil fuel consumption. However, global problems such as environmental destruction caused by fossil fuels and climate change have necessitated a shift towards sustainable energy policies. Consequently, the relationship between urbanization dynamics and the demand for green energy is becoming increasingly important.

This study comprehensively examines the impact of urbanization on energy consumption, emphasizing that transitioning to green energy is a crucial requirement for sustainable urban development. Factors such as the spatial structure of urbanization, population density, economic growth, and industrialization are the main drivers of energy demand. As an alternative to traditional energy policies, the adoption of renewable energy sources increases the environmental sustainability of cities and ensures energy supply security.

The development of green energy technologies has accelerated the transformation of cities' energy infrastructure. In contrast, smart city practices, energy efficiency, and carbon emission reduction have become central to sustainable urban development strategies. However, there are various economic and structural challenges in the process of integrating green energy investments and urban planning. The study argues that local governments, the private sector, and society need to act jointly in this transformation process and that sustainable urbanization policies should be approached from an energy justice perspective. As a result, steering urbanization in line with sustainable energy policies will be decisive in building more livable and low-carbon cities.

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1. Introduction

Urbanization is one of the most important phenomena transforming the economic, social, and demographic structure of modern societies. Accelerated by industrialization, population growth, and globalization, this process has turned cities into economic hubs and led to a significant increase in energy demand (Zhang, 2016). This, in turn, leads to an increase in fossil fuel consumption and deepening environmental problems (Musah et al., 2021). However, in line with sustainable development goals, strategies such as renewable energy use, technological innovation, and environmentally friendly urban planning can play an important role in reducing the environmental impacts of urbanization (Bekun et al., 2019). In this context, understanding the relationship between urbanization dynamics and energy consumption has become a critical requirement for building sustainable and livable cities (Yazar, 2006).

As the demand for energy increases with urbanization, cities are trying to meet this demand by supporting sustainability efforts through renewable energy projects. Recently, economists and policymakers have been closely monitoring the relationship between energy consumption and economic growth. Energy consumption is an important component of economic growth. As an important factor of growth, the energy demand is high (Hasanov et al., 2017).

Technological innovation, industrial transformation, and the development of renewable energy sources contribute to reducing dependence on fossil fuels, promoting sustainable development, and economic and social progress. Through innovative technologies, global economies can overcome the challenges posed by dwindling natural resources and meet the needs of a rapidly growing population without further degrading environmental quality. In this context, the transition from traditional technologies to environmentally friendly alternatives should be supported by practices such as recycling, reprocessing, the adoption of innovative processes, and the use of products that can substitute natural resources. This transformation will significantly support economic growth while reducing environmental destruction (Bekun et al., 2019).

In an increasingly globalized world, societies are developing at an ever-increasing rate. The rapid pace of urbanization, increasing energy demands, and sustained economic growth are reshaping this development and posing environmental challenges that require urgent attention. Urbanization has accelerated at an unprecedented rate worldwide, transforming cities into economic powerhouses and demographic hubs (Zhang, 2016). However, this transformation is also leading to significant environmental pressures. Indeed,

urban areas are responsible for significant portions of global pollution, resource depletion, and ecological degradation (Musah et al., 2021). Population shifts from rural to urban areas often lead to increased demand for infrastructure, energy, and land, deforestation, increased greenhouse gas emissions, and deteriorating air quality. These impacts highlight the need for sustainable urban planning that focuses on green spaces, efficient transportation, and low-impact infrastructure that can maintain ecological balance amid rapid urban growth (Addai et al., 2021). Through environmentally sound policies and infrastructure investments, cities can mitigate some of the negative environmental impacts of urbanization, contributing not only to economic development but also to improved environmental quality (Shaheen et al., 2020).

Due to population growth, the process of urbanization is becoming inevitable, and the effects of urbanization on the environment are gradually increasing. This process also leads to the expansion of the ecological footprint of cities (The University of Hong Kong, 2019).

Today, the rapid increase in energy demand in cities has caused studies on the energy-city relationship to gain more importance in urban planning processes. Urban planning is not limited to the organization and improvement of physical space but requires urban development to be addressed together with its economic, social, environmental, and physical dimensions. In this respect, it is of great importance to evaluate the interactions between these dimensions with a holistic approach (Yazar, 2006).

The increasing demand for energy with the acceleration of urbanization has made sustainable solutions mandatory. Considering the environmental impacts of fossil fuel consumption, cities' shift towards renewable energy sources stands out as a critical step in both economic and ecological terms. While green energy investments reduce the carbon footprint of cities, they also play an important role in ensuring energy supply security. Moreover, sustainable urban planning and smart city practices can increase energy efficiency and minimize environmental degradation.

2. Urbanization Dynamics and Green Energy

In this section, first, the basic dynamics of urbanization and urbanization will be discussed comprehensively, and then the relationship between green energy and urbanization will be presented.

2.1. Urbanization

Urban life, which has emerged in different civilizations of the world, expresses a structure that includes differences, although it constitutes a general unit in terms of historical and social conditions. This can also be seen in the names given to these living spaces, which have different meanings. In this context, the city has been called polis in Greek, cite in French, Medina in Arabic, burgh or borough in Germany and Saxony to Scandinavia, and urbs and civitas in Latin (Benevolo, 1995; p. 19).

Urbanization can be defined as an increase in the number of cities and the number of people living in cities. However, different definitions of urbanization have also been made. Kamrava (1992) defines urbanization as the increase in the number of people living in urban areas and the transition of the human element from a dispersed lifestyle to a clustered lifestyle around cities. According to Keleş (2023; p. 51), urbanization is the process of population accumulation that leads to an increase in the number of cities because of industrialization and economic development, and the resulting growth of cities, and changes in organization, specialization, and interpersonal relations in society because of growth.

Urbanization is not only a demographic phenomenon but also an expression of an economic, social, political, and cultural process. Urbanization is not only a process of attracting people to places called cities, but it also means their adoption of the urban way of life. Urbanization, which expresses a change and transformation in economic, social, political, and cultural fields, is the process of evolution of urban space and social practice (Kaya et al., 2007; p. 15). To mention the main characteristics of urbanization (Keleş, 2023; pp. 54-55):

- Urbanization is a demographic process and is increasing rapidly compared to industrialized countries.
- Large and medium-sized cities grow faster than small cities.
- Since the urbanization movement is concentrated in some geographical regions or cities, the rate of urbanization in other regions has remained slow.
- Due to the urbanization of most of the population, inadequacies have emerged in the provision of some public services.
- There are agglomerations in some service branches due to industrial investments for the employment of the urbanized population.

Urbanization is a phenomenon of dissolution, concentration, and flow with two ends. One end is the countryside, and the other is the city. Dissolution

takes place in the countryside. Concentration takes place in the city. Depending on the characteristics of dissolution and concentration, the flow also takes place between the countryside and the city. These three phenomena, namely rural decomposition, urban concentration, and the flow between rural and urban areas, are parts of a whole. They cannot be considered separately from each other. The way they function in time with each other constitutes the functioning of the urbanization process in a country (Kartal, 1983, p. 33).

Urbanization, which reflects the change in social structure, takes place in a process and shows a multidimensional characteristic. In this context, in Sencer's words, urbanization is first and foremost a demographic event. The population in urban areas increases with births, and migration also contributes to this increase to a significant extent. Since fertility trends are generally decreasing in the cities of developing countries, the population in urban areas is mostly fed by migration from rural areas. Therefore, urban population growth is achieved through natural increase and migration. The second aspect of urbanization is the transfer of population between economic sectors, or various is a change in the share of segments in the effective population. In this sense, urbanization means the shift of the population from agriculture to industry and services and, accordingly, the gain in efficiency of urban forms of labor power in the economy. Thirdly, urbanization is a settlement unit with internal physical and functional integrity.

Fourthly, urbanization refers to a process of social change and new formation. As such, the city shows an organized unity and a systematic integrity in which groupings are balanced. Finally, urbanization is a process of methodological organization. It is seen that the city is organized in a multi-organized and centralized system (Sencer, 1979; pp. 2-3).

Urbanization is not only limited to the movement of the population from rural to urban areas; it is also a multifaceted process with economic, social, cultural, and political dimensions. Addressing the phenomenon of urbanization with a holistic approach and supporting it with sustainable urban policies is critical for building livable cities of the future.

2.2. Urbanization Dynamics

Urbanization is shaped by a range of dynamics such as economic growth, demographic changes, technological advances, and political preferences. It should be kept in mind that these dynamics interact with each other and that urbanization processes take place in different ways in each society.

Economic factors have a decisive role in the urbanization process. With the Industrial Revolution, cities became centers of production, trade, and finance.

This process encouraged the rural population to migrate to cities and paved the way for the formation of large metropolitan areas (Harvey, 2005). Today, industrial production has been replaced by the service sector and knowledge-based sectors such as finance and information technologies. This has led to the emergence of global cities and the concentration of economic activities in certain centers (Sassen, 2001). Moreover, economic inequalities emerge as an important dynamic in the urbanization process. Imbalances in income distribution led to different social and spatial divisions within the city, creating differences between high-income and low-income groups in terms of housing and living standards. Neoliberal policies can further deepen these inequalities through urban transformation and dispossession processes (Smith, 1996).

Population growth and migration are among the driving forces of urbanization. Factors such as unemployment in rural areas, mechanization in agricultural production, and natural disasters cause people to migrate to cities (Castells, 1996). In addition, population growth occurring directly in cities also accelerates the urbanization process.

Migration takes two basic forms in the process of urbanization: internal migration and external migration. Internal migration is the movement of the population from rural areas to urban centers or the peripheries of large cities. This process accelerated, especially during periods of industrialization, and contributed to the shaping of the labor market in cities. External migration, on the other hand, is related to international mobility and has increased in recent years with the impact of globalization. Large cities have become centers of attraction for migrants as they offer economic opportunities. However, the integration processes of migrants in cities and issues such as social exclusion also play an important role in the dynamics of urbanization (Sassen, 2001).

Technological developments play a major role in the acceleration of urbanization. Advances in transportation, communication, and construction technologies contribute to the development of cities in a more planned and efficient manner (Soja, 2010).

The proliferation of the automobile has led to the expansion of cities towards the periphery and accelerated suburbanization processes. At the same time, the development of public transportation systems makes urban areas more compact and sustainable. Smart city technologies offer innovative solutions in areas such as transportation management, energy consumption, and security, making urbanization processes more efficient.

Urbanization processes are guided by state policies and urban planning strategies. Spatial planning policies, infrastructure investments, and housing

projects implemented by central and local governments are among the main factors determining the shape and speed of urbanization (Lefebvre, 1974).

The impact of neoliberal policies on urban development processes is manifested in practices such as the privatization of public spaces, mega projects, and rent-oriented transformation projects. For urbanization to be sustainable and inclusive, policies such as social housing projects, green space planning, and participatory management models should be adopted (Harvey, 2005).

Urbanization dynamics are multidimensional processes shaped by the interaction of economic, social, and political factors. While the direction and quality of urbanization are determined by the decisions and interventions of different actors, spatial transformation processes have a direct impact on the social structure. Therefore, balanced policies need to be developed for a sustainable and inclusive urbanization process.

2.3. Green Energy

The global COVID-19 pandemic has had the effect of accelerating historical transformations in the global energy sector by 2020, enabling the systematic realization of long-accumulated potential in the sector. The energy sector has been waiting for a clear direction for a long-term transformation, and in this context, the guarantee of new "green" markets and the existence of an ideologically unruffled demand are key elements that encourage the development of new technologies and capital qualities. The restructuring process in the energy sector is shaped by energy recovery methods, infrastructure projects, and new business models for capital behavior, while presenting a model that prioritizes transformation-oriented development demands (Ermolaev, 2021).

The growing human population and consumption levels have significantly increased global energy demand, leading to increasing environmental impacts, particularly pressures on global climate change. With the transition to renewable energy sources, a large share of the energy supply will come from renewable energy sources (REN21, 2017, p. 120).

Renewable "green" energy refers to electrical energy that is not derived from fossil fuels but from natural resources that can be continuously renewed. These energy sources include solar, wind, bioenergy, hydroelectric, geothermal, and environmental energy. Solar energy stands out as the most efficient and promising alternative among other renewable energy sources. The energy potential of the sun will not be exhausted for the next six billion years, and no additional cost is required to utilize this resource (Kuzior et al., 2021, p. 6).

The risk factors of traditional energy resources have increased, and these factors include the fact that conventional energy resources are approaching their exhaustion thresholds, environmental damage has irreversible effects, and traditional energy resources are insufficient to respond to evolving technological needs. For these reasons, the demand for renewable energy resources has increased, economic feasibility analyses have begun to be considered in a broader scope, and some resources have emerged as more economically attractive alternatives. Since the 1970s energy crisis, the importance of renewable energy sources has increased, and one of the common points of these energy types is that they have minimal environmental damage in the long term (Sorensen, 2004).

Due to factors such as rising oil prices, limited fossil fuel reserves, and environmental pollution, the use of renewable energy sources instead of conventional energy production methods is becoming increasingly important. In this context, wind, solar, water, biofuels, sea waves, and geothermal energy sources attract attention. However, long-term studies show that wind and solar energy are more practical and feasible in terms of direct conversion to electricity (Twidell and Weir, 1986). Nevertheless, sources such as coal and nuclear energy may continue to meet the world's energy needs for some time to come (Johnson, 1985).

Cleaner energy technologies play a critical role in all industrial and economic activities, promoting energy savings and sustainability (Mensah et al., 2019). Green innovation technologies aim to minimize carbon emissions and contribute to economic development by reducing the environmental impact of human activities (Ahmed, 2020; Chu, 2022). Energy intensity is the amount of energy consumed for a given economic activity and is considered an indicator of technical development (Hou et al., 2020; Koyuncu et al., 2021; Qi et al., 2019). While energy is critical for economic development and meeting basic needs, increasing dependence on non-renewable resources threatens ecological sustainability (Danish et al., 2020; Khan et al., 2022).

3. Effects of Urbanization Dynamics on Green Energy Demand

Urbanization, along with economic growth and population growth, leads to a significant increase in energy consumption. Today, the shift of cities towards sustainable energy policies has become one of the main dynamics driving the demand for green energy. Increasing green energy use in cities has both environmental and economic implications.

The urbanization process is directly related to infrastructure expansion and industrialization. Large-scale industrial facilities, transportation systems,

and housing projects increase energy demand and carbon emissions. For this reason, many city governments are promoting renewable energy sources by reducing fossil fuel dependency. For example, clean energy sources such as solar and wind energy offer an alternative solution, especially in cities with high energy consumption (Sheffield and Sheffield, 2021). However, within the scope of green energy policies, smart city technologies to increase energy efficiency are also increasingly being adopted. Smart grids, energy storage solutions, and digital monitoring systems help cities achieve sustainability in energy consumption (Gevorkian, 2022).

The demand for green energy is also closely linked to the transformation of urban transportation systems. Encouraging the use of electric vehicles, running public transportation systems on renewable energy, and expanding bicycle lanes contribute to achieving sustainability in energy consumption (Staffell and Green, 2021). In addition, urban transformation projects and green buildings encourage the use of renewable energy while reducing the energy demand of cities. In particular, buildings with LEED (Leadership in Energy and Environmental Design) certification stand out in terms of low carbon emissions and energy efficiency (Smith, 2023). In addition, architectural innovations such as passive design techniques, green roofs, and vertical gardens also increase energy efficiency in urban areas. However, the green energy transition also faces some structural challenges. First, the integration of renewable energy sources within the city can be costly. Although solar panels and wind turbines have high installation costs, they reduce energy costs in the long run (Elliott, 2020). In addition, identifying suitable areas for renewable energy investments in urban planning is a critical process. In cities with high population density, it can be difficult to find enough space for solar and wind energy facilities that require large areas. Therefore, local governments must consider urban density, land use policies, and energy supply security in energy planning (Powell, 2021).

Social factors also play an important role in the transition to green energy. The awareness and attitude of urban residents towards renewable energy directly affect the pace of green energy adoption. Education campaigns, incentive programs, and regulatory policies can help individuals and businesses increase their use of green energy. For example, some cities provide tax breaks and subsidies to encourage renewable energy investments (Johnston, 2022). In addition, the integration of renewable energy sources into the distribution system is also directly linked to urbanization. Smart energy management systems play a critical role in balancing energy production and consumption. Smart meters and energy management platforms used in cities increase efficiency by optimizing energy demand. The use of energy storage technologies is becoming

increasingly widespread, especially in large metropolitan areas, to address imbalances between renewable energy production and consumption. In this context, lithium-ion batteries and hydrogen fuel cells stand out as important tools to ensure the energy security of cities. On the other hand, the concept of energy justice in cities is increasingly being discussed. The lack of equitable access to renewable energy due to socioeconomic differences can increase energy poverty in cities. Difficulties in accessing energy in low-income areas are another important factor that local governments should consider when formulating sustainable energy policies. Increasing subsidies and supporting community-based solutions such as energy cooperatives are needed to make green energy accessible to all.

Urbanization dynamics are one of the important factors that both drive and shape green energy demand. For cities to realize sustainable energy transformation, strategic planning is required in a wide range of areas, from infrastructure investments to urban transportation policies. The cooperation of local governments and the private sector is one of the most important factors accelerating the integration of green energy into urban life. In addition, raising social awareness stands out as one of the critical factors determining the success of green energy transformation. Ensuring the wider adoption of renewable energy sources while planning the long-term energy strategies of cities is of great importance for both economic development and environmental sustainability.

4. Discussion

Urbanization is a process that accelerates economic growth, population growth, and technological developments, and radically changes the structure of modern societies. The process of urbanization, together with industrialization and transformations in the service sector, is attracting more people to urban centers around the world and increasing the population density of large cities. However, this transformation has led to a sharp increase in energy demand, posing major challenges for environmental sustainability. Since traditional energy systems are heavily dependent on fossil fuels, accelerating urbanization is leading to increased global carbon emissions and environmental degradation. In this context, the urbanization process needs to be aligned with sustainable energy policies. Green energy-based solutions are emerging as a critical strategy to ensure the sustainability of cities, reduce carbon emissions, and increase energy security. Renewable energy sources, especially energy generation based on low-carbon technologies such as solar, wind, biomass, and hydropower, help cities minimize their environmental impact. However, a successful green energy transition requires comprehensive planning and the implementation of

multifaceted policies. While the green energy transition offers many advantages, it also faces some structural and economic challenges. These challenges can be summarized as follows:

- **High Initial Costs:** The implementation of renewable energy projects requires high initial costs compared to traditional fossil fuel-based power generation. In particular, infrastructure investments such as solar panels, wind turbines, and energy storage technologies require large-scale capital.
- **Integration with Existing Urban Structures:** Cities' existing energy infrastructures are largely based on fossil fuel systems, making renewable energy integration difficult. This can make new energy projects time-consuming and costly.
- **Energy Storage and Distribution Issues:** Green energy sources do not inherently provide continuous and stable energy production (e.g., the sun does not shine at night, or the wind does not blow constantly), which increases the need for energy storage technologies. Adapting grid infrastructure to these changes requires significant engineering and planning in terms of energy management.
- **Socioeconomic Barriers:** The lack of equal opportunities for different segments of society to access renewable energy poses a significant challenge to energy justice. Incentive mechanisms and public support should ensure access to green energy systems for low-income groups.

The following strategies should be implemented for sustainable urbanization and the successful integration of green energy systems:

- Integrated Energy Management with Smart City Technologies. Smart city technologies can increase the energy efficiency of cities by optimizing energy consumption. Smart grids can balance supply and demand by monitoring energy production and consumption in real time. Smart meters and energy management systems can help consumers control their energy consumption while enabling utilities to operate more efficiently.
- Making Transportation Green Energy Sensitive Urban transportation systems account for a large share of energy consumption. Therefore, public transportation systems must be designed to run on renewable energy. Practices such as electric buses, bicycle lanes, walkable city models, and public transportation incentives can contribute to the green energy transition by reducing fossil fuel consumption.

- Green Building Practices and Energy-Efficient Urban Planning. One of the most effective ways to reduce the energy consumption of cities is to increase the energy efficiency of buildings. Certification systems such as LEED (Leadership in Energy and Environmental Design) and BREEAM encourage the construction of energy-efficient buildings. Passive design techniques, the use of solar energy, green roofs, and vertical gardens can minimize energy consumption in urban areas.
- Increasing Renewable Energy Generation Capacity in Cities. Integrating renewable energy generation systems such as solar panels and wind turbines in various parts of cities can help cities produce their own energy and reduce their dependence on foreign energy. In cooperation with municipalities and the private sector, renewable energy investments within cities should be encouraged.
- Ensuring Energy Justice and Increasing Social Participation. The transition to green energy needs to be carried out in a socially just manner. Government subsidies, energy cooperatives, and community-based renewable energy projects should be promoted to ensure access to energy for low-income groups.

In conclusion, the transition to green energy systems has become an inevitable necessity for urbanization to achieve a sustainable structure. However, this transformation is not only a technical change but also a multifaceted process involving economic, social, and political dimensions. The relationship between urbanization and green energy is one of the most important elements that will shape the cities of the future.

In the coming years, more radical changes are expected in the energy policies of cities. Increasing investments in green energy, expanding smart city technologies, and raising public awareness are critical for sustainable urbanization.

In the long run, urban planning strategies based on renewable energy can serve as a driver of economic growth while ensuring environmental sustainability. In the fight against global climate change, cities' orientation towards innovative and low-carbon energy solutions will be one of the cornerstones of sustainable development worldwide.

In this context, the integration of urbanization policies with renewable energy will lead to more resilient, livable, and sustainable cities. In this process, academic studies, public policies, and private-sector collaborations will play a critical role.

References

Addai, Kwaku, Serener, Berna and Kırıkkaleli Derviş. 2022. "Empirical Analysis of the Relationship Among Urbanization, Economic Growth, and Ecological Footprint: Evidence from Eastern Europe." Environmental Science and Pollution Research 29 (19): 27749-27760. https://doi.org/10.1007/s11356-021-17311-x.

Ahmed, Khalid. 2020. Environmental Policy Stringency, Related Technological Change and Emissions Inventory in 20 OECD Countries. Journal of Environmental Management 274: 111209. https://doi.org/10.1016/j.jenvman.2020.111209.

Bekun, Festus V., Alola, Andrew A., and Sarkodie, Samuel A. 2019. "Toward a Sustainable Environment: Nexus Between CO2 Emissions, Resource Rent, Renewable and Nonrenewable Energy in 16-EU Countries." Science of the Total Environment 657: 1023-1029.

Benevelo, Leonardo. 1995. Avrupa Tarihinde Kentler. Translated by Nur Nirven. İstanbul: AFA Yayıncılık A.Ş.

Castells, Manuel. 1996. The Rise of the Network Society. Oxford: Blackwell Publishers.

Chu, Lan K. 2021. Economic Structure and Environmental Kuznets Curve Hypothesis: New Evidence from Economic Complexity. Applied Economics Letters 28 (7): 612–616. https://doi.org/10.1080/13504851.2020.1767280.

Chu, Lan K. 2022. Determinants of Ecological Footprint in OECD Countries: Do Environmental-Related Technologies Reduce Environmental Degradation? Environmental Science and Pollution Research International 29 (16): 23779–23793. https://doi.org/10.1007/s11356-021-17261-4.

Danish, Ulucak, Recep, and Khan, Salah, U. D. 2020. Determinants of the Ecological Footprint: Role of Renewable Energy, Natural Resources, and Urbanization. *Sustainable Cities and Society* 54: 101996.

Elliott, David. 2020. Renewable Energy and the Public: From NIMBY to Participation. London: Palgrave Macmillan.

Erbaş, Erdem. 2008. "Local Energy Planning in New Development Areas." UCTEA Chamber of City Planners Journal of Planning 30.

Ermolaev, Dmitry. 2021. "Platform Transformations in the Energy Market." Strategy Group Sofia. Event Horizon. Available online: https://sg-sofia.com.ua/new-energy-order-and-platform-capitalism (accessed on 15 March 2025).

Gevorkian, Peter. 2022. Smart Grid Redefined: Transformation of the Electric Utility. Cambridge: Academic Press.

Harvey, David. 2005. A Brief History of Neoliberalism. Oxford: Oxford University Press.

Hasanov, Fakhri, Bulut, Cihan, and Suleymanov, Elchin. 2017. "Review of Energy-Growth Nexus: A Panel Analysis for Ten Eurasian Oil Exporting Countries." Renewable and Sustainable Energy Reviews 73: 369-386.

Hou, Jian, Wang, Jinghua, Chen, Jiancheng, and He, Fang. 2020. Does Urban Haze Pollution Inversely Drive Down the Energy Intensity? A Perspective from Environmental Regulation. Sustainable Development 28 (1): 343–351. https://doi.org/10.1002/sd.2022.

Jane, Powell. 2021. Energy, Sustainability and the Environment. Amsterdam: Elsevier.

Johnson, Gary L. 1985. *Wind Energy Systems*. Englewood Cliffs, NJ: Prentice Hall.

Johnston, Robert J. 2022. The Economics of Renewable Energy Policies. Oxford: Oxford University Press.

Kamrava, Mehran. 1992. Politics and Society in the Developing World. London: Routledge.

Kartal, S. Kemal. 1983. Economic and Social Aspects of Urbanization in Turkey. Ankara: Yurt Publications.

Kaya, Erol, Şentürk, Hulisi, Danış, Osman ve Şimşek, Sami. 2007. Modern Urban Management- I. Ankara: Okutan Publications.

Khan, Muhammad K., Babar, Samreen. F., Oryani, Bahareh., Dagar, Vişal., Rehman, Abdul., Zakari, Abdulrahseed, and Khan, Muhammad, O. 2022. "Role of Financial Development, Environmental-Related Technologies, Research and Development, Energy Intensity, Natural Resource Depletion, and Temperature in Sustainable Environment in Canada." *Environmental Science and Pollution Research International* 29(1): 622–638.

Keleş, Ruşen. 2023. Urbanization Policy. 20th ed. Ankara: İmge Publications.

Koyuncu, Tuğba, Beşer, Mustafa K., and Alola, Andrew A. 2021. Environmental Sustainability Statement of Economic Regimes with Energy Intensity and Urbanization in Turkey: A Threshold Regression Approach. Environmental Science and Pollution Research International 28 (31): 42533–42546.

Kuzior, Aleksandra, Lobanova, Alla y Kalashnikova, Liudmyla. 2021. "Green Energy in Ukraine: State, Public Demands, and Trends" *Energies* 14, no. 22: 7745. https://doi.org/10.3390/en14227745.

Lefebvre, Henri. 1968. Le Droit à la Ville. Paris: Anthropos.

Lefebvre, Henri. 1974. The Production of Space. Oxford: Blackwell.

Mensah, Claudia N., Uzun, Xingle, Dauda, Lamine, Boamah, Kofi B., Selman, Muhammed, Appiah-Twum, Floransa, and Tachie, Andrews T. 2019. Technological Innovation and Green Growth in the Organization for Economic Cooperation and Development Economies. Journal of Cleaner Production 240: 118204. https://doi.org/10.1016/j.jclepro.2019.118204.

Muhammed, Musah, Yusheng, Kong, Isaac, Adjei M., Stephen, Kwadwo A., and Mary, Donkor. 2021. "The Connection Between Urbanization and Carbon Emissions: A Panel Evidence from West Africa." Environment, Development and Sustainability 23: 11525-11552. https://doi.org/10.1007/s10668-020-01124-y.

Qi, Shao Z., Peng, Hua R., and Zhang, Yue J. 2019. Energy Intensity Convergence in Belt and Road Initiative (BRI) Countries: What Role Does China-BRI Trade Play? *Journal of Cleaner Production* 239: 118022. https://doi.org/10.1016/j.jclepro.2019.118022.

REN21. 2017. *Renewables 2017 Global Status Report.* Paris: REN21 Secretariat. http://www.efaidnbmnnnibpcajpcglclefindmkaj/https://www.ren21.net/wp-content/uploads/2019/05/GSR2017_Full-Report_English.pdf. (accessed on 16 March 2025).

Sassen, Saskia. 2001. The Global City: New York, London, Tokyo. Princeton: Princeton University Press.

Sencer, Yakut. 1979. Urbanization in Turkey. Ankara: Ministry of Culture Publications.

Shaheen, Aliya, Sheng, Jinyong, Arshad, Sadia, Salam, Shafaq, and Hafeez, Muhammad. 2020. "The Dynamic Linkage Between Income, Energy Consumption, Urbanization, and Carbon Emissions in Pakistan." Polish Journal of Environmental Studies 29 (1). DOI: 10.15244/pjoes/95033.

Sheffield, John W., and Çiğdem Sheffield. 2021. *Renewable and Alternative Energy Resources: A Reference Handbook.* Santa Barbara: ABC-CLIO.

Smith, Neil. 1996. The New Urban Frontier: Gentrification and the Revanchist City. London: Routledge.

Soja, Edvard W. 2010. Seeking Spatial Justice. Minneapolis: University of Minnesota Press.

Sorensen, Bent E. 2004. Renewable Energy, Third Edition, Elsevier.

The University of Hong Kong Centre for Studies in Urban Sustainability. 2019. "What is Sustainable Urban Development?" Accessed [date]. http://www.dupad.hku.hk/susurban/What%20is%20Sustainable%20Urban%20Development.htm. (accessed on 16 March 2025).

Twidell, John and Weir, Tony. 1986. Renewable Energy Resources. E. and F. N. Spon Ltd., London and New York. http://dx.doi.org/10.4324/9780203478721.

Yazar, Kadir H. 2006. "A Proposal of an Urban Planning Method for the Medium-Sized Cities within the Framework of Sustainable Urban Development." PhD diss., Ankara University Graduate School of Social Sciences, Department of Political Science and Public Administration.

Zhang, Xing Q. 2016. "The Trends, Promises and Challenges of Urbanisation in the World." Habitat International 54: 241-252. https://doi.org/10.1016/j.habitatint.2015.11.018.