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ICT and Green Sustainability: The Twin Transition for MENA Countries ? [1]

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Executive Summary

In our work (Ferragina et al., 2023) we investigate the relationship between Information and Communication Technologies (ICTs) and environmental sustainability in the Middle East and North Africa (MENA) region.

Through the analysis encompassing various dimensions of ICT adoption and energy utilization, our findings offer crucial insights into the potential impact of technological advancements on carbon emissions and energy conservation.
The results reveal peculiar patterns, emphasizing the pivotal role of ICTs in increasing energy efficiency mitigating environmental impacts. Alternative energy sources show promise for emissions reduction, highlighting the importance of sustainable energy technologies. Furthermore, the study underscores the need for context-specific policies and interventions, emphasizing the multifaceted nature of these relationships.

Overall, the MENA region faces severe air quality challenges, with significant implications for public health and the economy and urgent measures are necessary to address these issues and improve air quality for the well-being of the population and sustainable development. Tackling air pollution and improving air quality in the MENA region is crucial to protect public health, promote sustainable development, and mitigate the negative impacts of urbanization and energy consumption. In addition, air pollution-induced rising temperatures exacerbate the issue of water scarcity, which is a pressing concern in the MENA region. Therefore, public policies should support investment in digital infrastructure, and improve the digital literacy across the laggard MENA regions. Such policies would remove digital inequalities across MENA countries and also increase social and economic cohesion. This policy brief provides a foundation for further exploration and policy formulation towards a sustainable and technologically driven future for the MENA region.

1. Introduction

Recently, the environmental impacts of unchecked economic expansion have become more apparent spurring a shift towards a broader perspective that embraces environmental sustainability as a cornerstone of economic success. Concepts such as 'green productivity', 'green growth' and the 'circular economy' have emerged, integrating environmental considerations into conventional productivity and growth models. In particular, prioritising sustainable economic growth can pave the way for a more equitable and inclusive society (Kahn, 2015). However, this paradigm shift remains an area ripe for further exploration, with ongoing debates about the intricate trade-offs between economic growth, productivity and environmental sustainability highlighting the complexity of balancing these facets.

The severity of environmental degradation, characterised by a prevailing 'pollute first, treat later' approach (Zhao et al., 2021; Wang et al., 2020), demands urgent attention. Urban populations worldwide are facing increased exposure to hazardous pollutants that exceed the latest health-based guidelines set by the World Health Organization for particulate matter (PM 2.5) and CO2 emissions, posing significant health risks.

Beyond the immediate economic and social impacts, the wider impacts include climate destabilisation, threats to the health of the oceans and loss of biodiversity. Alarmingly, scientists worldwide are warning of an impending mass extinction crisis (Barnosky et al., 2011), highlighting the urgent need for collective action and a comprehensive approach to address these challenges. In this context, an optimal and efficient use of resources is fundamental for a production that is sustainable in the long term and, with this in mind, the MENA region plays a pivotal role in the global energy landscape, holding a significant share of the world's energy resources.

As of 2021, it accounted for 52% of the world's oil reserves and 43% of its natural gas reserves (BP, 2022). However, air quality in the Middle East and North Africa (MENA) region has deteriorated significantly, with Egypt being the worst country for PM2.5 exposure and in Cairo the PM2.5 concentration being about 12 times as high as the WHO limit (Wolf at al., 2022). Other major cities in the region also face similar air quality issues.

The shift in energy production and consumption patterns has contributed to high levels of air pollution. Most cities in low- and middle-income countries in MENA fail to meet air quality guidelines set by the World Health Organization (WHO). Airborne particulate matter (PM) resulting from emissions by power plants, factories, and vehicles is a major concern. The consequences of poor air quality go beyond financial costs and have a significant impact on human health. An estimated 125,000 lives were lost in the MENA countries in 2013 to diseases associated with outdoor and household air pollution (e.g., WB and IHME, 2016). These health issues not only cause suffering but also impede economic development. Egypt and Lebanon are among the countries most affected, experiencing high numbers of deaths and substantial economic losses.

Following the literature, we know that ICT technology has the potential to contribute significantly to sustainable low-carbon development (Dong et al., 2021; Wang et al., 2021) and play a relevant role in addressing climate change (Lahouel et al., 2021). However, the diffusion of ICT faces barriers in rural or less developed regions, including technical requirements (Lee et al., 2017) and educational disparities (Fong, 2009), resulting in a concentration mainly in developed areas, which is associated with economic growth and environmental impacts (Liu et al., 2021). Hence, ICT technology can lead to an unbalanced regional industrial structure, resulting in wasted resources and increased emissions (Fang et al., 2020; Li et al., 2017). The impact of ICT technology on carbon emissions remains mixed and poses challenges for policy makers.

Therefore, this policy brief aims to provide new insights into the crucial and controversial relationship between ICT technology and CO2 intensity for MENA countries.

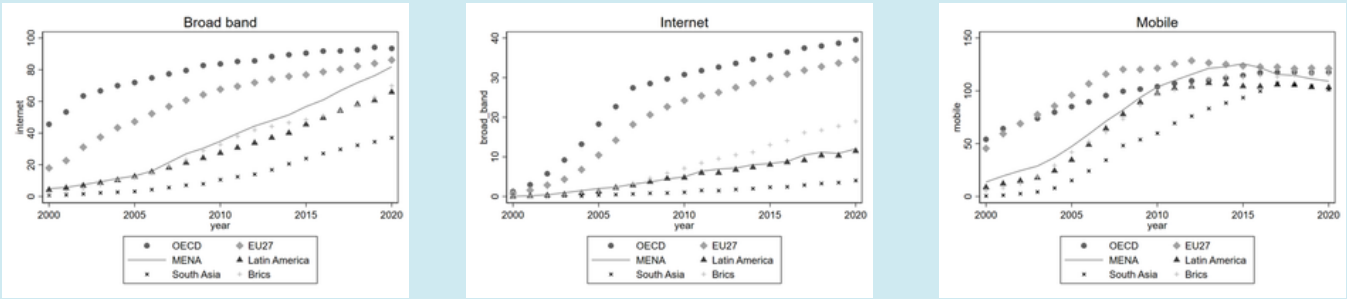
Our results suggest that ICT digital tools can promote economic prosperity without compromising environmental integrity: the ICT digital revolution has the potential to drive green productivity growth by implementing innovative solutions for energy and resource management.

2. ICTs, energy conservation, optimization, and pollutant emissions: where MENA countries stand?

We first look at which stage are the MENA with respect to the ICT diffusion indicators. We consider the fixed broadband subscriptions per 100 capita, mobile cellular subscriptions per 100 capita, and individuals using the internet in % of population.

The level of ICT diffusion varies greatly among the MENA countries and the area appears to be far from the level of both OECD and EU27 countries (Fig. 1). For example, the number of Internet users varies from around 24 per 100 inhabitants in Yemen to 93 per 100 inhabitants in Bahrain. Another important indicator is the fixed broad band subscriptions, which provide the infrastructure for high-speed internet connections, enabling efficient data transmission and access to a wide range of online services. In this case, the differences between our samples are pronounced: Kuwait shows only 1% of fixed broadband subscriptions per 100 capita, whereas Israel has 27%. The average of fixed broadband subscriptions per 100 capita in our MENA countries is below 8%.

Fig. 1 – ICTs indicators: evolution over time by country group



(a) (b) (c)

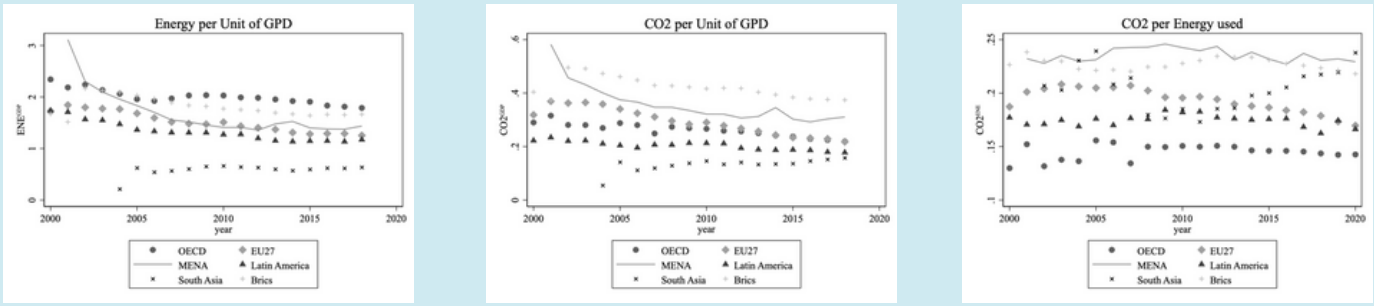
Notes: Figure (a) shows the evolution of the Internet usage, measured as the Individuals using internet as share of population. Figure (b) shows the evolution of the number of mobile cellular subscription per 100 people. Figure (c) shows the number of broadband subscriptions per 100 people

Source:: Authors' own elaboration using data from QoG-WDI.

The case of mobile cellular subscriptions is extremely important for the quality of life in these countries: the level of mobile subscriptions is quite high in all countries in our sample. In the lowest one (Yemen), there were 53 mobile cellular subscriptions per 100 inhabitants, but in ten other MENA countries (United Arab Emirates, Kuwait, Bahrain, Saudi Arabia, Oman, Jordan, Israel, Tunisia, Morocco, and Algeria), mobile cellular subscriptions exceeded 100 percent. Mobile subscriptions are particularly relevant in regions where fixed-line infrastructure may be limited.

As far as energy is concerned (Fig. 2), the MENA countries appear to be the only area that has not remarkably reduced its emissions per unit of GDP, as the values remain constant over the two decades under consideration (-0.15%).

Fig. 2 – Energy Intensity, CO2 intensity and CO2 per energy use: evolution over time by country group



(a) (b) (c)

Notes: Figure (a) shows the evolution of the Energy intensity, measured as the energy use per unit of GDP. Figure (b) shows the evolution of the CO2 intensity, measuring the CO2 emissions per unit of GDP. Figure (c) shows the CO2 emissions per unit of energy used

Source: Authors' own elaboration using data from EDGAR GGE- EC dataset.

When we consider the whole sample, our first dependent variable, the CO2 emissions per unit of GDP ($CO2$itGDP), reveals important insights into the environmental footprint of these economies. Indeed, we find that, on average, our sample countries generate approximately 29.34units of CO2 for every unit of GDP. This metric carries significant implications for understanding the carbon intensity of these economies. However, the range of variation is extensive, spanning from a minimum of 3.9 to a maximum of 106.7, underscoring the diversity in emission profiles.

Similarly, CO2 emissions per unit of energy consumption (CO2itENE) provide crucial insights. On average, our sample countries emit approximately 19.56units of CO2 for every unit of energy consumed. Again, we observe considerable variability, with values ranging from 3.1 to 46.9. This metric serves as a key indicator of the efficiency of energy use and its associated environmental impact.

Turning our attention to energy-related variables, we delve into energy intensity (ENEitGDP). This metric, which gauges the amount of energy consumed for each unit of economic output, averages at about 1.56.This indicates that, on average, our sample countries require approximately 1.56 units of energy to produce one unit of economic output. This figure has significant implications for understanding the energy efficiency of these economies.

To have a first glance we measure ICTs, energy, and pollutants correlation. We do not get a strong correlation path among the values in 2015 for MENA countries, but countries more linked to natural resources tend to have higher primary energy consumption per unit of GDP. As for ICTs and CO2 intensity for MENA countries in 2015, no strong relationship between these variables appears, particularly in the case of Internet access and mobile subscriptions, where this relationship seems to be non-existent or weak. However, there is a connection between fixed broadband subscriptions and CO2 intensity. Israel is undoubtedly the most advanced country in the MENA area, and consequently, its CO2 intensity aligns with that of more advanced countries. Turkey and the United Arab Emirates, together with Israel, have the lowest environmental impact per unit of GDP produced. Finally, in the case of CO2 emission per unit of energy used the pattern appears slightly clearer with countries with higher adoptions of ICTs showing lower values of CO2 emissions.

3. Approach and Results[2]

3.1. ICT Impact on Energy: Three Hypotheses

We investigate three distinct hypotheses pertaining to the effects of ICT adoption on energy dynamics and on emissions. Specifically, we hypothesize that ICT exerts three key influences:

- The conservation of energy
- The optimization of energy utilization
- The reduction of pollutant emissions.

Aligning with this conceptual framework, we posit that increasing the penetration/usage of ICT can enhance the energy efficiency of production processes, leading to both energy conservation and enabling the adoption of cleaner alternative energy sources, thereby reducing CO2 emissions.

Our sample consists of 113 countries of which 15 belonging to the MENA area, spanning the period from 2001 to 2020. The dataset is mainly built on two data sources:

- The first one, is the Standard Dataset proposed by the Quality of Government (QoG) Institute (University of Gothenburg), which provides country-level information and key indicators for our study related to energy consumption, production of alternative energy, GDP, GDP per capita, and multiple indicators related to ICT infrastructure (fixed broadband subscriptions per 100 capita, mobile cellular subscriptions per 100 capita, and individuals using the internet in % of population).

- The other data set that we use in our analysis is the Greenhouse Gas Emissions (GGE) dataset, which provides information on CO2 annual emissions sourced from the Global Carbon Project. To test our hypotheses, we estimate three different models in which we use three different dependent variables according to the hypothesis we are considering.

[2] For more details on the methodology and approach, please refer to the FEMISE conference paper:
Ferragina, et. al., 2024

To measure the impact of ICT technologies on energy and environmental related variables, we use three different dependent variables:

- The primary energy consumption per unit of GDP, reflecting the efficiency of an economy in terms of energy utilization
- The production-based CO2 emissions divided by its total annual gross domestic product – to measure how carbon-intensive a country's economy is at time t (CO2itGDP)
- The production-based CO2 emissions per unit of primary energy to measure how carbon-intensive a country's energy mix is (e.g., a nation predominantly dependent on coal will register substantial CO2 emissions per unit of energy, while a country endowed with a significant share of nuclear and renewable energy sources will exhibit markedly lower emissions in comparison).

To assess the impact of Information and Communication Technology (ICT) on energy efficiency and emission reduction, we employ a set of three distinct ICT-related variables, encompassing both utilization and infrastructure, and incorporate them with a one-year lag to address potential simultaneity concerns. Specifically, we use the individuals using the internet as % of population, the number of fixed broadband subscriptions per 100 capita, and mobile cellular subscriptions per 100 capita. In addition, we introduce a series of control variables designed to account for factors that may exert influence on our three dependent variables. Firstly, we incorporate the urbanization rate, defined as the proportion of the total population residing in urban areas. Urbanization has led to a substantial increase in energy demand and related emissions, further deteriorating air quality in major MENA cities.

Subsequently, we include two energy-related variables to control for the extent of alternative energy utilization measured as the percentage of alternative and nuclear energy in relation to total energy consumption, as well as the level of primary energy usage prior to its transformation into other end-use fuels. Moreover, to address variations in the economic composition of different countries, we encompass the value added in agriculture and forestry, and fishing (percentage of GDP). Additionally, we account for the level of human capital in country by considering the enrolment rate in secondary education.

3.2. Can ICT be Beneficial for Clean Energy? Results

First, our results shed light on the ICTs and energy efficiency. The dependent variable, primary energy consumption per unit of gross domestic product (measured in kilowatt-hours per dollar of GDP in 2011), serves as a crucial metric in assessing the efficiency of energy utilization.

Looking at the relations of the controls, several key insights emerge. Notably, urbanization exhibits a positive albeit modest effect on energy consumption per GDP, implying that as countries urbanize, there is a marginal increase in energy use relative to economic output. This result aligns with the conventional understanding of urban centers as hubs of economic activity and, consequently, higher energy demand.

Furthermore, the alternative energy use introduces a noteworthy dynamic. The alternative energy use positively affects energy efficiency, signifying the potential of diversified energy sources in contributing to a more sustainable economic model. This finding underscores the importance of promoting and investing in alternative energy technologies, which can yield substantial gains in energy conservation (Acheampong, 2018).

Turning to the role of ICTs, the internet and mobile subscriptions deserve special attention. On average, higher internet usage is associated with lower energy intensity. This intriguing finding suggests that digitalization, particularly through internet adoption, may lead to enhanced energy efficiency, potentially through increased automation and streamlined processes.

Moreover, critical insights into the region's unique dynamics are gained but further exploring. The relationship between internet usage and energy intensity differs for MENA countries compared to the rest of the sample. Moving to broadband subscriptions, the relationship with energy intensity differs for MENA countries compared to the rest of the sample underscoring the beneficial effect in terms of reduction of energy use for MENA countries, as well as the need for region-specific policies that address the unique challenges and opportunities in leveraging broadband technologies for energy conservation.

Finally, for mobile penetration associated positive correlation emerges with lower energy intensity. This finding aligns with the notion that mobile technologies enable more efficient communication and resource management, potentially leading to reduced energy consumption. This finding is also confirmed for the MENA region. Overall, the analysis of broadband and mobile subscriptions, along with their specific patterns for the MENA region, provide insights into the positive relationship between ICT adoption and energy efficiency.

Moving to the relationship between ICTs and CO2 intensity the results are also providing important highlights. Internet subscriptions, when considered independently, show a statistically significant negative correlation, indicating that higher internet penetration is associated with lower CO2 intensity and this relationship does not significantly differ for MENA countries. Mobile subscriptions are indeed not statistically significant in most specifications, suggesting that mobile subscriptions may not have a strong direct effect on CO2 intensity.

Broadband also shows a non-significant effect in most specifications for the overall sample. However, for the MENA region a significant negative effect emerges, indicating that the adoption of broadband technologies in MENA countries may be associated with lower CO2 intensity. This suggests that broadband technologies, when combined with the specific context of MENA countries, can potentially contribute to reduced carbon emissions. Overall, these results shed light on the strong relationship between ICT adoption and CO2 intensity, highlighting the importance of considering specific technologies and their interaction with regional characteristics in crafting effective policies for carbon emissions reduction.

Finally, turning to the results of the relationship between ICTs and carbon emissions per unit of energy consumption we see that ICT variables reveal intriguing insights. Internet considered independently exhibits a statistically significant negative effect, indicating that higher internet penetration is associated with lower emissions per unit of energy consumed. Mobile subscriptions statistically significant positive effect, indicating that higher mobile subscription rates are associated with increased emissions per unit of energy consumed. Broadband subscriptions do not exhibit a statistically significant effect in most specifications.

4. Implications and Recommendations

Challenges in Optimizing ICT Transition

Through our study, we want to contribute to the analysis of how to tackle a sustainable process of twin transition, digital and green, in the MENA region. Optimizing ICT transition cannot be achieved without an improvement in terms of better access to fixed broadband, reduction of cost, and improvement in the distribution of this infrastructure. In fact, in many cases, this infrastructure seems to be replaced by mobile subscription.

An integrated approach is needed in terms of an increase in resource efficiency, identifying and reducing trade-offs, and enhancing collaboration and governance across sectors. The government can bridge the technology gap by also introducing foreign capital, opening the market, and realizing the reduction of carbon emissions through ICT technology.

Policy Recommendations for Sustainable ICT Implementation

Policymakers in MENA countries should consider targeted approaches to maximize the benefits of these technologies while addressing their potential energy implications. The MENA region needs practical measures implemented without disrupting development efforts. This may involve incentivizing energy-efficient practices in the telecommunications sector and promoting the adoption of sustainable technologies.

Moreover, the findings underscore the potential of alternative energy sources and digital technologies in driving sustainable economic development.

Impact of ICT on Economic Growth and Carbon Emissions

ICT technologies will lead to rapid technological growth and resource-saving dividends, which may effectively offset the increase in carbon emissions brought about by the scale of production agglomeration in the initial period. In general, cities with higher carbon emissions already have complete foundations of the ICT industry, so technological innovation brought by ICT agglomeration is ineffective in mitigating carbon emissions.

In addition, due to the existence of the rebound effect, cities with higher economic development levels will likely use the high income generated by energy. Excessive agglomeration may also exert a crowding effect, leading to vicious competition within the region. It requires a large amount of supporting infrastructure constructions and relies on fossil fuels for power generation, increasing energy consumption.

Barriers to ICT Implementation in South Shore Countries

As for the development of ICT implementation, it seems not to be rising to the challenges as many barriers are still limiting the applications. The digital revolution is likely to drastically change the economic growth and economic structure of the MENA economies and the political arena in these countries, as the political movement demonstrated during the political turmoils of 2010.

Although ICT implementation finally seems to be rising to the challenges in South shore countries, there are clearly a number of barriers still limiting applications and efficiency. First of all, multiple ICT applications require high specific skills (e-skills) that in turn require States to implement overall strategies in this sphere.
Secondly, the weight of the content developed of products or services marketed via the Internet in the South Mediterranean remains weak and marginal on the global scale.

Overall, our results highlight the multifaceted nature of these relationships, emphasizing the need for context-specific policies and interventions. Harnessing the potential of ICTs for environmental conservation requires a nuanced approach that considers regional dynamics, technological advancements, and energy conservation strategies. This research sets the stage for further exploration and policy formulation in the pursuit of a sustainable and technologically driven future for the MENA region.

There are sensitive measures that could be undertaken by governments at both the national and regional levels, which could help achieve these goals in the region:

- On the ground of the likely rebound effects due to congestion related to ICT activities is to encourage institutions to innovatively develop new ICT tools such as those related to green finance, digital commerce and e-business activities, and other ICT-related service activities to stimulate the vitality of the ICT services market.

- Further policy recommendations are about favouring digital industrialization transformation and setting up measures to attract more high-quality ICT industries.

- Furthermore, the government should guide the integration of conventional and ICT industries to increase industrial synergy and also prioritize investments in green innovation and focus on subsidies and tax incentives for the ICT industry that invest in renewable energy and green technologies, as well as impose penalties for excessive carbon emissions.

- The ICT industry may reduce carbon emissions from coal power generation in combination with clean technologies by promoting the use of renewable energy.

- Governments should establish the ICT industry cooperation zone, improve the resource sharing of local ICT industries, complement advantages, and further promote the efficient use of resources and rapid technological progress.

- A strong effort is required to continue to invest in terms of capital allocation developed for the purpose of environmental protection, while slowing down the approval process for high-polluting and high-input industries and strengthening the green transformation of enterprises.

- Other basic policy goals are reducing the waste of resources in the process of promoting the agglomeration of ICT industries and promoting the agglomeration of ICT activities and economic factors by following standards and norms for ICT agglomeration in the future. In addition, from the perspective of the distribution characteristic of ICT agglomeration, the phenomenon of ICT agglomeration in core regions may exacerbate regional disparities. Mutual promotion and development of ICT industries and regional cooperation in environmental governance among regions are urgent.

- A strategy to foster digital skills should be based on a joint effort carried out in a coordinated manner by the North and the South Mediterranean countries. This is essential in order to prevent brain drain. In the economic application of technology we need to take into account that a "skill biased technology change" is likely to occur which cannot benefit all people and all countries to the same time. Indeed, it can even cause inequalities between countries or people to grow, a factor that also calls for the implementation of specific development strategies.

- Follow some best practices: Local air pollution and its associated health costs have led many societies especially Asian emerging economies, to recognize the importance of adopting clean energy technologies. Environmental policy reform in Asia includes efforts to combat air pollution and decrease key pollutants, such as sulphur dioxide (SO2) and nitrogen oxides (NOX), without compromising economic growth.

- A new report by the UN Environment Programme proposes twenty-five solutions that can significantly improve air quality on the world's most populated continent, Asia. They could also be implemented and enforced in other regions as well including the MENA region.

References

Dong, X., Jiang, Q., & Wang, J. (2021). Assessing Embodied Carbon Emission and Its Intensities in the ICT Industry: The Global Case. Frontiers in Energy Research, 9. https://doi.org/10.3389/fenrg.2021.685021

Ferragina, Anna M., Iandolo, Stefano , Sergio, Ivan and Taymaz, Erol Taymaz. 2024. "ICT AS A DRIVER OF GREEN ECONOMIC GROWTH IN THE MENA AREA", FEMISE Conference Paper no.5. https://www.femise.org/en/slideshow-en/conference-paper-5-ict-as-a-driver-for-green-economic-growth-in-the-mena-area/

Fang, J., Tang, X., Xie, R., & Han, F. (2020). The effect of manufacturing agglomerations on smog pollution. Structural Change and Economic Dynamics, 54, 92–101. https://doi.org/10.1016/j.strueco.2020.04.003

Fong, M. W. L. (2009). Digital Divide Between Urban and Rural Regions in China. The Electronic Journal of Information Systems in Developing Countries, 36(1), 1–12. https://doi.org/10.1002/j.1681-4835.2009.tb00253.x

Kahn, M. E. (2015). Review: A Review of "The Age of Sustainable Development" by Jeffrey Sachs Reviewed Work(s): The Age of Sustainable Development by Jeffrey Sachs. Source: Journal of Economic Literature, 53(3), 654–666. https://doi.org/10.1257/jel.52.l.654

Lee, C. C., He, Z. W., & Xiao, F. (2022). How does information and communication technology affect renewable energy technology innovation? International evidence. Renewable Energy, 200, 546–557. https://doi.org/10.1016/j.renene.2022.10.015

Li, Y., Shi, X., Emrouznejad, A., & Liang, L. (2017). Environmental performance evaluation of Chinese industrial systems: a network SBM approach. In Journal of the Operational Research Society.

Liu, S., He, N., Shi, Y., & Li, G. (2021). The roles logistics agglomeration and technological progress play in air pollution — New evidence in sub-regions of Chongqing, China. Journal of Cleaner Production, 317. https://doi.org/10.1016/j.jclepro.2021.128414

Lahouel, B.B., Lotfi T., Younes B.Z., Shunsuke M., (2021) Does ICT change the relationship between total factor productivity and CO2 emissions? Evidence based on a nonlinear model, Energy Economics, Volume 101, 105406, doi.org/10.1016/j.eneco.2021.105406.

Wang, J., Jiang, Q., Dong, X., & Dong, K. (2021). Decoupling and decomposition analysis of investments and CO2 emissions in information and communication technology sector. Applied Energy, 302. https://doi.org/10.1016/j.apenergy.2021.117618

WB and IHME (2016). The cost of air pollution: strengthening the economic case for action.

Wolf, M. J., Emerson, J. W., Esty, D. C., Sherbinin, A. d., and Wendling, Z. A. (2022). 2022 Environmental Performance index (EPI) Results. Technical report, New Haven, CT: Yale Center for Environmental Law & Policy.

Zhao, J., Zhao, Z., & Zhang, H. (2021). The impact of growth, energy and financial development on environmental pollution in China: New evidence from a spatial econometric analysis. Energy Economics, 93. https://doi.org/10.1016/j.eneco.2019.104

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