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COMPARATIVE ANALYSIS OF GREEN TECHNOLOGY INVESTMENTS IN MEGA-REGIONS: THE CASES OF THE UNITED STATES, EUROPE AND PEOPLE'S REPUBLIC OF CHINA

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ПОРІВНЯЛЬНИЙ АНАЛІЗ ІНВЕСТИЦІЙ У ЗЕЛЕНІ ТЕХНОЛОГІЇ У МЕГАРЕГІОНАХ: ПРИКЛАДИ СПОЛУЧЕНИХ ШТАТІВ, ЄВРОПИ ТА КНР

Formulation of the problem. Mega-regions or urban archipelagos are increasingly recognized as vital engines of the global economy and significant contributors to environmental impact. These sprawling urban constellations concentrate substantial populations and economic activities, making them critical arenas for addressing sustainability challenges. As the urgency of climate change and the need for environmental stewardship intensifies, investments in green technologies within these mega-regions have become paramount. These investments are essential for mitigating the environmental footprint of these densely populated and economically active areas and for achieving broader urban sustainability and climate change mitigation goals.

Analysis of recent research and publications. The issues of mega-regions or urban archipelagos in general development of American megaregions and green technologies investments into these huge metropolitan areas have been studied by different scholars [4; 17; 20; 24]. In China mega-regions and investments into clean energy and the environmental footprint mitigation have been a focus of research for Myllyvirta L., Qin Q., Qiu C., Taoli H., Luo Z., Yuan R., Sun F., Chen Y., Tong L., Qi Q., Wu H., Wen X., Ye T., Zheng H., Ge X., Yang K. [23; 27; 30].

The European Union aims to strengthen its role as a global frontrunner in technology, innovation, and clean energy. By tackling major challenges and building on its current advantages, European mega-regions have the opportunity to boost its competitiveness, drive economic growth, and serve as a model for a successful green energy transition [1].

Several leading European researchers are actively studying investments in green renewable energy, contributing valuable insights into policy, finance, and technology: C. Kemfert focuses on energy economics and how policy decisions impact renewable energy investments [19]. O. Edenhofer, is regarded to be one of the world's leading experts on climate change policy, environmental and energy policy, and energy economics [10]. M. Mazzucato explores mission-driven green investments and the role of public-private partnerships in financing sustainable energy transitions [22]. Other researchers such as C. Breyer,

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B. Praetorius, A. Löschel and C. Carraro examine climate finance mechanisms and the economics of renewable energy deployment with a focus on cost-effective solar and wind investments.

Setting objectives. This article aims to provide a comparative analysis of green technology investments across prominent mega-regions in the United States, Europe, and China by examining the scale, sectoral focus, and underlying drivers of these investments, highlighting the similarities and differences in their approaches to fostering a more sustainable urban future. To achieve the stated aim of the article, the following research tasks are defined: identify and characterise the leading mega-regions in the United States, Europe, and China in terms of their economic, technological, and urban development profiles; compare the key drivers (economic, institutional, political, and environmental) that influence green technology investment patterns in the selected mega-regions; assess the outcomes and impacts of these investments on regional sustainability, innovation capacity, and urban resilience; identify similarities and differences in regional approaches and synthesize best practices and lessons learned; develop policy-relevant conclusions and recommendations for enhancing green technology investment strategies in urban mega-regions globally.

Presentation of the main research material. Megaregions or urban archipelagos are understood as large, interconnected networks of urban areas linked by shared economic systems, natural resources, and transportation infrastructure [6, p. 66]. Below is a comparative table 1 of nine leading mega-regions, highlighting their common features and key differences across geography, economic strengths, governance/integration models, and green-technology drivers.

Table 1

Leading mega-regions with their common features and key differences

Mega-Region	Geography & Scope	Main Economic Strengths	Governance / Integration	Green-Tech Drivers & Focus
Northeast (US)	Boston-Washington Atlantic corridor	Finance, academia, government, services	Polycentric conurbation; RPA/bi-state compacts	Aging infrastructure - retrofit; RGGI cap-and-trade; policy-led
Great Lakes (US)	Lakes Ontario-Michigan-Erie-Huron corridor	Manufacturing, transport/logistics	Cross-state; US-Canada coordination	Industrial decarbonization; circular economy; waterway transport
Southern California (US)	Los Angeles–San Diego–Inland Empire	Tech, entertainment, trade, services	Metro-centered; state-level planning (CA)	Solar expansion; EVs/transit; water-efficiency; wildfire resilience.
Blue Banana (EU)	UK-Benelux-Germany - N. Italy corridor	Heavy industry, finance, trade	Multinational corridor; EU policy frameworks	Cleaner production; trans-national infra; EU ETS compliance.
Randstad (NL)	Amsterdam–Rotterdam-The Hague-Utrecht cluster	Logistics, finance, high-tech services	Polycentric metro; national-regional planning	Integrated urban sustainability; water management; circularity.
Rhine-Ruhr (DE)	Düsseldorf-Cologne-Essen-Dortmund axis	Heavy industry, chemicals, manufacturing	Federal state & municipal partnerships	Site remediation; renewables; energy efficiency.
Yangtze River Delta (CN)	Shanghai + Jiangsu, Zhejiang, Anhui provinces	High-tech manufacturing, finance, logistics	Central-provincial “city-cluster” plan	Eco-development; clean industry; green infrastructure
Greater Bay Area (CN)	Shenzhen-Hong Kong-Guangzhou + 9 cities	Electronics, finance, trade, R&D	“One country, two systems” integration model	Clean manufacturing; sustainable supply chains; cross-SAR funding
Jing-Jin-Ji (CN)	Beijing-Tianjin + Hebei Province	Tech/R&D (Beijing), manufacturing, services	Policy-driven relocation; transport corridor	air pollution control; renewables; green transport; Xiong'an hub

Source: compiled by the authors on [1; 4-7; 9; 16; 17;18; 28; 29]

In the United States the Regional Plan Association (RPA) has identified eleven emerging mega-regions across the country. For the purpose of this comparative analysis, three prominent and geographically diverse examples will be examined: The Northeast Megaregion, the Great Lakes Megaregion, and the Southern California Megaregion.

The Great Lakes Megaregion is a major manufacturing and transportation hub in North America, sharing a significant economic and environmental relationship with Canada. This region is increasingly focused on industrial decarbonization, the circular economy, and addressing legacy environmental issues [7].

While precise aggregate investment figures for each US mega-region over the past 5-10 years are not

readily available in the provided snippets, the existence of initiatives like the Great Lakes *Impact Investment Platform* indicates a significant financial commitment in this region. The Conference of Great Lakes St. Lawrence Governors & Premiers created the *Great Lakes Impact Investment Platform* to support sustainable economic growth in the region. This cross-border, impact-driven initiative is one of the first of its kind, offering a unique model for environmentally focused investment that can be adapted to other natural resource regions worldwide. This platform features projects representing nearly \$4.5 billion in investments (fig. 1), focused on forestry, smart water systems, agriculture, and energy [15; 20]. The Great Lakes St. Lawrence region holds 20 % of the world's surface freshwater. If it were its own country, the region would be the world's third-largest economy, generating about \$6 trillion annually.

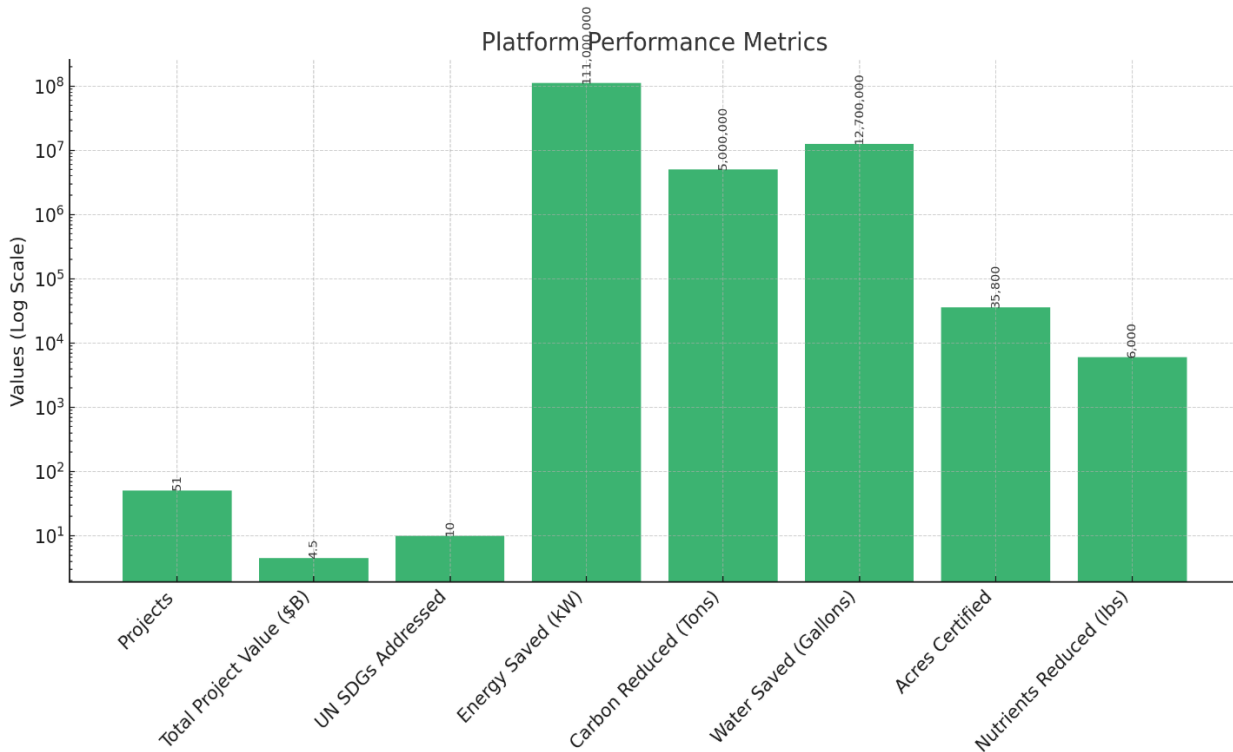


Fig. 1. Great Lakes Platform Performance Metrics

Source: compiled on [15]

Similarly, California Climate Investments represents a substantial state-level funding mechanism for a wide range of green technologies in Southern California, with nearly \$10 billion implemented throughout the state over a decade. The INVEST CLEAN project in Southern California alone was awarded nearly \$500 million by the U.S. EPA in July 2024 to transition the goods movement and logistics corridor to zero emission technologies Across California, 117 programs under the California Climate Investments initiative, managed by 27 State agencies, are channeling billions of dollars to support the State's shift toward a low-carbon and more equitable future [13].

For the Northeast, the Regional Greenhouse Gas Initiative (RGGI), a cooperative effort to cap and reduce power sector carbon dioxide emissions, has raised over \$4 billion since its inception. This revenue has been reinvested by participating states in local energy efficiency programs, renewable energy projects, and other initiatives. Although comprehensive total investment data is elusive, the presence of these multi-billion-dollar initiatives and projects across these US mega-regions clearly demonstrates a substantial financial commitment to green technologies over the past decade [32].

Total Investment in Selected European Mega-Regions

The Randstad region in the Netherlands has benefited from a total of € 2.34 billion in EU investments across 6,250 projects involving partners based in the region between 2014 and 2018. These investments have supported various policy areas, including the economy, innovation, environment, landscape, nature, mobility, infrastructure, and energy. The European Investment Bank (EIB) also provided an additional € 150 million in 2014 for TenneT's Randstad grid project, aimed at strengthening the electricity transmission network and facilitating the integration of renewable energy from North Sea wind [28]. In the Rhine-Ruhr region, InnovationCity Ruhr in Bottrop has seen a total investment of €290 million planned between 2010 and 2020 for its ambitious project on the ecological revitalization of urban areas and the reduction of CO2 emissions [16]. While specific total investment figures for the entire Blue Banana region are not provided in the snippets, the concentration of major industrial and financial centers within this corridor suggests a very large, albeit potentially distributed and challenging to aggregate, scale of investment in green technologies

over the past 5-10 years.

Total Investment in Selected Chinese Mega-Regions

China's national investment in clean energy reached an estimated 6.8 trillion yuan (\$940 billion) in 2024, reflecting the immense scale of financial commitment at the country level, which significantly impacts its mega-regions [23]. The Yangtze River Delta region has been a focus for green financing initiatives, with the investments in the water, wastewater, and solid waste management sectors. This project was co-financed by a €150 million loan from the German Development Bank (KfW) [33].

The Asian Development Bank (ADB) has been actively involved in the Beijing-Tianjin-Hebei region, establishing a Green Financing Platform. As of January 2024, this platform had financed 49 subprojects with a total investment of CNY3.24 billion and provided CNY3.04 billion in guaranty services, leveraging a total investment of CNY13.66 billion in areas including energy efficiency and renewable energy [33]. Furthermore, Guangdong province in the Pearl River Delta is planning a substantial investment of \$41.4 billion in the emerging low-altitude electric vehicle economy over the next 2.5 years, indicating a significant focus on sustainable transportation [2; 3].

Sectoral Breakdown of Green Technology Investments

The Northeast stands out among US mega-regions where investments are notably directed towards renewable energy, with New York and New England forecasting significant growth in solar and offshore wind capacity [24]. There is also a considerable emphasis on sustainable transportation, with efforts to modernize public transit systems and facilitate the adoption of electric vehicles through infrastructure development and incentives. Green building initiatives are gaining traction, with programs promoting energy efficiency upgrades and electrification in residential and commercial buildings. Investments in waste management solutions, while present, are less explicitly detailed in the provided snippets compared to the other sectors.

The following bar chart (fig. 2) visualizes these shifts in generation share from 2025 to 2035. Positive bars indicate growth in share; negative bars (for natural gas) indicate a decline.

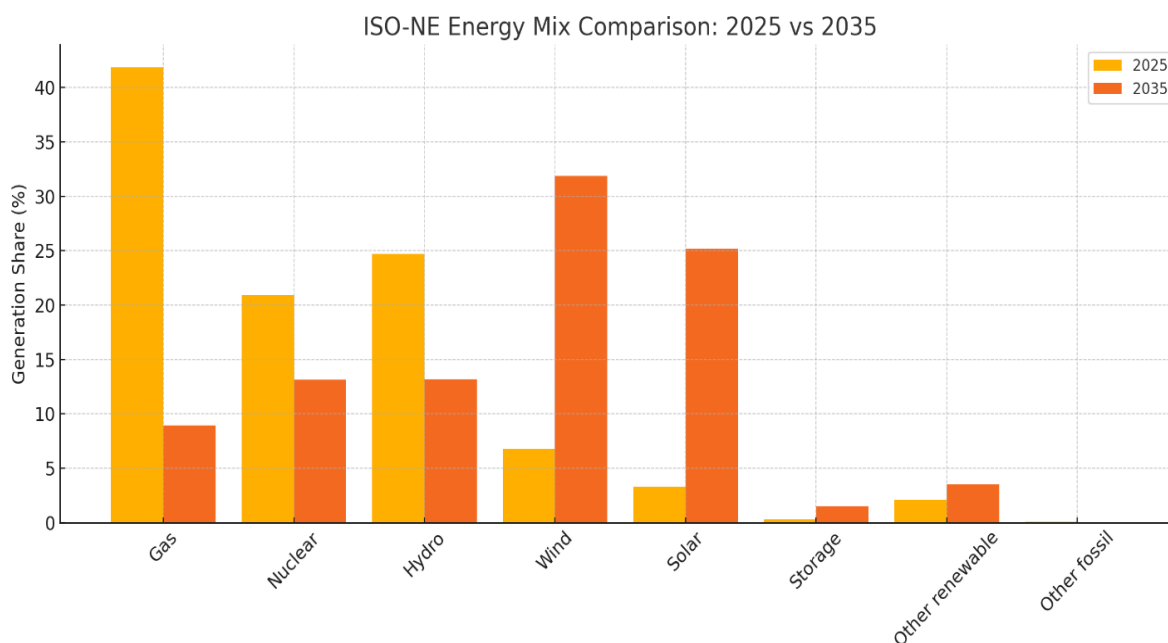


Fig. 2. Comparison of using different sources of energy in 2025 and 2035

Source: compiled on [24]

Green technology investments across major global mega-regions reveal a diverse sectoral focus, shaped by regional policy priorities, environmental challenges, and economic strategies.

The chart below (fig. 3) illustrates green technology investment trends across major global mega-regions, highlighting four key sectors: renewable energy, sustainable transportation, green buildings, and waste management. U.S. regions – like the Northeast, Great Lakes, and Southern California – focus heavily on renewables and electric mobility, with growing interest in energy-efficient buildings. European regions, particularly the Randstad and Rhine-Ruhr, show balanced investment across all sectors, supported by strong policy frameworks. China's mega-regions prioritize renewables and transportation, especially electric vehicles and high-speed rail, with varied progress in waste and building sectors. Overall, renewable energy and transportation dominate, while waste and building investments vary by region.

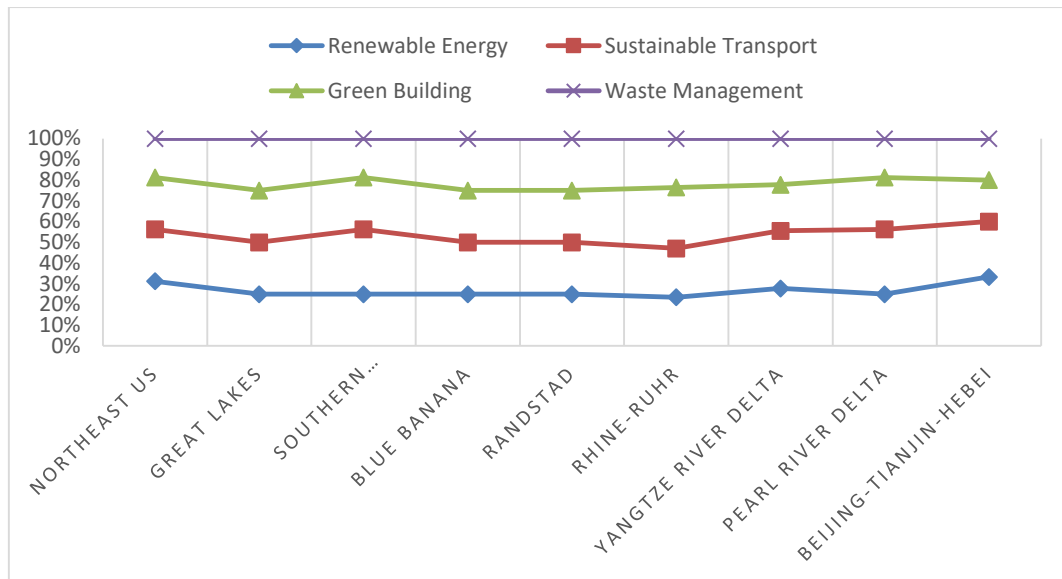


Fig. 3. Sectoral Breakdown of Green Technology Investments in Mega-regions

Source: compiled on [2; 8; 14; 20; 24-27; 30; 31; 34; 35]

The table 2 provides a comparative overview of the estimated relative proportions of green technology investments across the selected mega-regions. Renewable energy consistently receives high or medium investment across all regions, underscoring its importance in global decarbonization efforts. Sustainable transportation emerges as a major focus, particularly in regions grappling with air quality issues or characterized by high levels of personal vehicle use, such as Southern California and the Pearl River Delta. Green building initiatives appear to receive a more consistent level of medium investment in the US and Europe, while the emphasis might be relatively lower in some Chinese mega-regions based on the available information. Waste management demonstrates a more variable pattern of investment, potentially reflecting differences in regional priorities and the integration of waste management within broader circular economy strategies, especially in some European regions like the Randstad and Rhine-Ruhr. These varying investment proportions underscore the diverse challenges and priorities shaping the green technology landscape in each mega-region. Regions with strong policy mandates for renewable energy, like the Randstad and Rhine-Ruhr, tend to allocate a higher proportion of investment to this sector. Conversely, regions facing significant transportation-related pollution, such as Southern California and the Pearl River Delta, prioritize investments in sustainable transportation solutions.

Table 2

Comparative Analysis of Investment Proportions by Sector

Mega-Region	Renewable Energy	Sustainable Transportation	Green Building	Waste Management
Northeast US	High	Medium	Medium	Low
Great Lakes US	Medium	Medium	Low	Medium
Southern California US	Medium	High	Medium	Low
Blue Banana Europe	Medium	Medium	Medium	Medium
Randstad Europe	High	High	Medium	Medium
Rhine-Ruhr Europe	High	Medium	Medium	Medium
Yangtze River Delta China	High	High	Medium	Medium
Pearl River Delta China	Medium	High	Low	Low
Beijing-Tianjin-Hebei China	High	Medium	Low	Low

Source: compiled on [2; 8; 14; 20; 24-27; 30; 31; 34; 35]

Green technology investments across global mega-regions are primarily driven by three interconnected forces: government policies and regulations, economic incentives and funding mechanisms, and rising public awareness.

Government policies and regulations are foundational. In the U.S., state and federal initiatives like the Inflation Reduction Act and state-level mandates in California and the Great Lakes region establish clear market signals for green innovation [22]. In Europe, the EU's *Fit-for-55* and national programs in Germany and the Netherlands create a regulatory framework that mandates cleaner energy and construction practices

[12]. China's five-year plans and strict pollution control measures in key urban mega-regions align national targets with green transitions.

Economic incentives and funding mechanisms provide the financial support needed for market adoption. In the U.S., tax credits, rebates, and investment platforms like the Great Lakes Impact Investment Platform lower costs for consumers and attract private investors. Europe leverages substantial funding from Horizon 2020 and regional development funds, alongside green bonds and subsidies for energy efficiency and renewable projects. China has used extensive subsidies – now transitioning to green finance platforms and public-private partnerships – to drive investments in renewables, EVs, and urban infrastructure.

Public awareness and societal pressure significantly shape the demand side. In the U.S., public concern over climate impacts fosters consumer demand for cleaner alternatives, particularly in states like California and the Northeast [24].

In Europe, high societal awareness and environmental advocacy translate into strong political will and policy support. China, where pollution has visibly impacted quality of life, is seeing rising public pressure on the government to invest in green technologies, particularly in urban mega-regions like Beijing-Tianjin-Hebei.

Together, these three forces interact across different contexts but consistently catalyze investment in renewable energy, clean transport, green buildings, and sustainable waste systems across mega-regions globally (fig. 4).

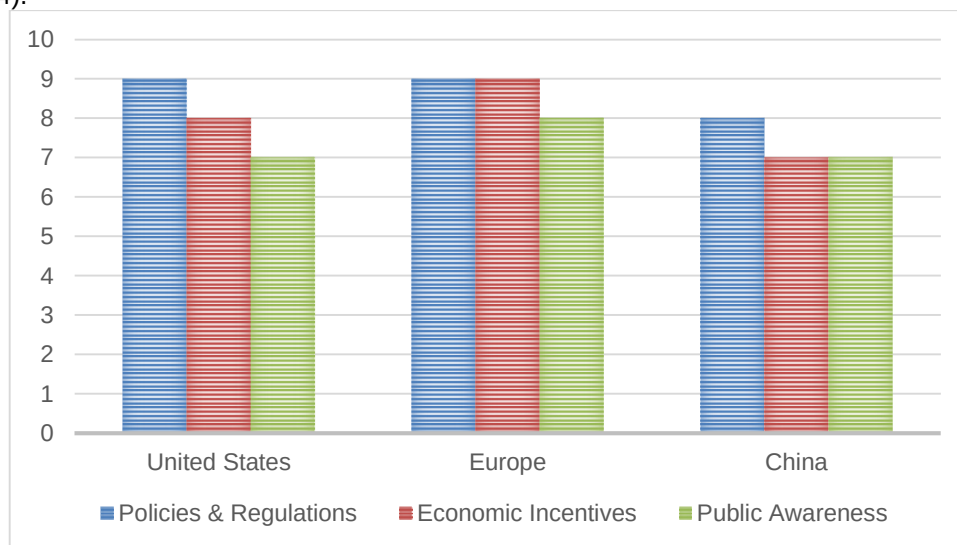


Fig. 4. Key Drivers behind Green Technology Investments by Region

Source: compiled by the authors on [12; 23; 24]

Challenges and Opportunities in Implementing Green Technologies

Implementing green technologies in mega-regions presents both significant challenges and compelling opportunities. One major challenge is the outdated infrastructure in many regions, such as electricity grids in the Northeast US and Europe's Blue Banana, which require upgrades to support renewable energy integration and electric vehicles. High upfront costs for technologies like solar panels, electric buses, and energy-efficient buildings remain a barrier, especially for small businesses and low-income communities. Additionally, complex regulations and land-use constraints in densely populated urban areas hinder the deployment of large-scale green projects. Ensuring social equity in the transition to green technologies is also essential, as benefits should be accessible to all, not just affluent groups.

Despite these hurdles, green technologies offer substantial benefits. They help reduce greenhouse gas emissions and improve air quality, which enhances public health and mitigates climate change. Economically, green technology sectors generate jobs in manufacturing, installation, and R&D, fostering innovation and regional economic growth. Renewable energy adoption boosts energy security by decreasing reliance on fossil fuels. Improvements in transportation, construction, and waste management systems contribute to more sustainable and livable urban environments.

Several successful initiatives highlight these opportunities. In the US, the Regional Greenhouse Gas Initiative (RGGI) and programs like Michigan Saves and INVEST CLEAN support clean energy financing and zero-emission transportation. In Europe, InnovationCity Ruhr and the Randstad's mobility policies demonstrate effective urban greening and infrastructure modernization. TenneT's Randstad 380 project exemplifies grid upgrades to handle renewables. In China, the Yangtze River Delta Eco-Green Zone balances economic growth with environmental protection, while projects like the Fengning North Integrated Smart Energy Station showcase multi-energy integration.

All in all, although challenges such as cost, infrastructure, and policy complexity remain, the broad environmental, social, and economic benefits of green technologies provide strong incentives for mega-

regions to invest in a sustainable future.

Conclusions from the conducted research. Green technology investments in American, European, and Chinese mega-regions reveal both similarities and key differences shaped by distinct economic, political, and social contexts. China leads in scale, with massive central government-driven investments aligned with national priorities. In contrast, the US adopts a more decentralized, market-based model, with state-level initiatives and private sector leadership. Europe takes a harmonized approach through EU-wide policy frameworks and funding mechanisms, ensuring coordinated action across member states.

Despite differing governance structures, all three regions prioritize renewable energy, electric mobility, and sustainable urban development. Common goals include reducing emissions, enhancing public transit, and promoting green building practices. Public awareness and government support act as universal drivers, although emphasis varies regionally.

Economic priorities also differ: the US focuses on innovation and competitiveness, Europe on global sustainability leadership, and China on green growth as a response to environmental degradation. Politically, the US federal system often results in fragmented efforts, while the EU balances national and supranational roles, and China's centralized model allows swift implementation of green initiatives.

Overall, while strategies vary, the shared commitment to sustainability provides a strong foundation for cross-regional collaboration. Recognizing and integrating these differences will be vital to achieving global environmental goals and fostering sustainable urban development.

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ПОРІВНЯЛЬНИЙ АНАЛІЗ ІНВЕСТИЦІЙ У ЗЕЛЕНІ ТЕХНОЛОГІЇ У МЕГАРЕГІОНАХ: ПРИКЛАДИ СПОЛУЧЕНИХ ШТАТІВ, ЄВРОПИ ТА КНР

Мета. Порівняльний аналіз інвестицій у зелені технології в провідних мегарегіонах США, Європи та Китаю шляхом вивчення масштабів, галузевої спрямованості та ключових чинників цих інвестицій, із виокремленням подібностей і відмінностей у підходах до формування сталого урбаністичного майбутнього.

Методика дослідження. У дослідженні використано як загальнонаукові, так і спеціальні методи. Індуктивний і дедуктивний підходи були застосовані під час збору та обробки даних. Порівняльний метод дозволив проаналізувати масштаб, структуру та динаміку інвестицій у зелені технології в основних мегарегіонах США, Європи та Китаю. За допомогою контент-аналізу були вивчені стратегічні документи й аналітичні звіти, а статистичний аналіз дозволив оцінити показники, зокрема обсяги інвестицій та співвідношення державного й приватного фінансування. Метод кейс-стаді забезпечив глибше розуміння особливостей розвитку конкретних регіонів. Систематичний огляд літератури узагальнив наявні дослідження з питань зеленої трансформації та сталого міського розвитку.

Результати дослідження. Встановлено, що інвестиції у зелені технології в США, Європі та Китаї мають спільні стратегічні пріоритети, зокрема розвиток відновлюваної енергетики, електротранспорту та сталого міського середовища. Обґрунтовано, що ключові відмінності полягають

у масштабах інвестування, інституційній структурі та механізмах управління: Китай демонструє централізовану модель, США – децентралізовану, а ЄС – багаторівневу координацію через політику Європейського Союзу.

Доведено, що Китай наразі лідирує за обсягами фінансування, що зумовлено національними пріоритетами «зеленого» економічного зростання та жорстким державним регулюванням.

Проаналізовано, що у США домінує ринкова модель, орієнтована на приватні інвестиції, ініціативи штатів та технологічні інновації, тоді як Європа прагне до глобального лідерства через узгоджену екологічну політику та фінансові інструменти.

З'ясовано, що громадська підтримка та інституційна взаємодія залишаються визначальними чинниками успіху, хоча ступінь їх впливу істотно відрізняється у трьох регіонах.

Проведений порівняльний аналіз дозволив виокремити спільні цілі сталого розвитку, які створюють сприятливі умови для посилення міжнародної співпраці та обміну ефективними практиками, незважаючи на різні підходи до політичного управління (фрагментований у США, багаторівневий в ЄС, централізований у КНР).

Наукова новизна результатів дослідження. Вперше обґрунтовано інтегративний підхід до аналізу інвестицій у зелені технології у провідних мегарегіонах світу (США, ЄС, Китай), що, на відміну від існуючих досліджень, які здебільшого зосереджені на окремих країнах або секторах, дає змогу системно порівняти інвестиційні стратегії, політичні рамки та структурні особливості екологічної модернізації.

Доведено, що ефективність інвестицій у зелені технології значною мірою визначається типом політичного управління: фрагментованим (США), багаторівневим (ЄС) та централізованим (Китай), що істотно впливає на масштаби, швидкість та інституційну стабільність «зеленого» переходу.

Встановлено, що спільні цілі сталого розвитку, попри відмінності у підходах, створюють синергетичні можливості для міжнародного співробітництва, обміну найкращими практиками та формування глобальних екологічних партнерств.

Удосконалено методологічні підходи до порівняльного аналізу зелених інвестицій шляхом розробки міжрегіональної аналітичної моделі, яка поєднує інвестиційну динаміку з результатами сталого урбаністичного розвитку.

Набуло подальшого розвитку наукове уявлення про роль інституційних чинників, зокрема інноваційних екосистем, екологічного законодавства та державної підтримки, у формуванні інвестиційних потоків у сфері зелених технологій.

Запропонований підхід дозволяє глибше осмислити взаємозв'язок між екологічною політикою, урбаністичними трансформаціями та глобальними економічними трендами.

Практична значущість результатів дослідження. Дослідження пропонує цінні рекомендації для міських планувальників, економістів та інвесторів, ідентифікуючи ключові чинники, виклики та успішні практики впровадження зелених технологій у провідних мегарегіонах.

У статті розглядаються цільові інвестиційні стратегії та аналітичні інструменти, які можуть бути використані для підтримки регіонального співробітництва та масштабування ефективних моделей. Запропонована аналітична рамка дозволяє оцінити інноваційний потенціал і орієнтувати розвиток сталого міського середовища.

Ключові слова: мегарегіони, урбаністичні архіпелаги, інвестиції в зелені технології, сталий економічний розвиток, відновлювана енергія, глобальне економічне середовище, механізми фінансування.

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COMPARATIVE ANALYSIS OF GREEN TECHNOLOGY INVESTMENTS IN MEGA-REGIONS: THE CASES OF THE UNITED STATES, EUROPE AND PEOPLE'S REPUBLIC OF CHINA

Purpose. This article aims to provide a comparative analysis of green technology investments across prominent mega-regions in the United States, Europe, and China by examining the scale, sectoral focus, and underlying drivers of these investments, highlighting the similarities and differences in their approaches to fostering a more sustainable urban future.

Methodology of research. General scientific and specialized methods were used during the study. Inductive and deductive reasoning guided the collection and processing of data. The comparative method enabled analysis of the scale, structure, and dynamics of green technology investments in major mega-regions of the U.S., Europe and China. Content analysis was used to examine strategic documents and reports, while statistical analysis assessed indicators such as investment volumes and public and private funding ratios. Case studies of key regions (e.g., Greater Bay Area, Northeastern Corridor, and Blue Banana) offered deeper insights. A systematic literature review synthesized existing research on green transitions and sustainable urban development.

Findings. It has been established that investments in green technologies in the United States, Europe, and China share common strategic priorities, particularly the development of renewable energy, electric transport, and sustainable urban environments. It has been substantiated that key differences lie in

the scale of investment, institutional structures, and governance mechanisms: China demonstrates a centralized model, the U.S. a decentralized one, and the EU relies on multi-level coordination through European Union policy.

It has been proven that China currently leads in terms of funding volume, driven by national priorities for “green” economic growth and strict state regulation. The analysis shows that the U.S. is dominated by a market model focused on private investment, state-level initiatives, and technological innovation, whereas Europe aims for global leadership through coordinated environmental policies and financial instruments.

It has been identified that public support and institutional interaction remain decisive success factors, although their influence varies significantly across the three regions. The comparative analysis has made it possible to highlight shared sustainable development goals, which create favourable conditions for strengthening international cooperation and exchanging effective practices, despite differing approaches to political governance (fragmented in the U.S., multi-level in the EU, and centralized in China).

Originality. For the first time, an integrative approach has been substantiated for analysing investments in green technologies across major global mega-regions (the USA, the EU, and China). Unlike existing studies, which are mostly focused on individual countries or sectors, this approach enables a systematic comparison of investment strategies, political frameworks, and structural features of ecological modernization.

It has been proven that the effectiveness of investments in green technologies is largely determined by the type of political governance – fragmented (USA), multi-level (EU), and centralized (China) – which significantly influences the scale, pace, and institutional stability of the green transition.

It has been established that shared sustainable development goals, despite differing approaches, create synergistic opportunities for international cooperation, exchange of best practices, and the formation of global environmental partnerships.

Methodological approaches to the comparative analysis of green investments have been improved through the development of an interregional analytical model that links investment dynamics with sustainable urban development outcomes.

Scientific understanding of the role of institutional factors – particularly innovation ecosystems, environmental legislation, and state support – in shaping investment flows in the green technology sector has been further advanced.

The proposed approach offers deeper insight into the interconnection between environmental policy, urban transformations, and global economic trends.

Practical value. This research provides valuable insights for policymakers, urban planners, and investors by identifying key drivers, challenges, and best practices in green technology across major mega-regions. It supports targeted investment strategies, fosters regional cooperation, and promotes model replication. The article examines targeted investment strategies and analytical tools that can be used to support regional cooperation and scale up effective models. The proposed analytical framework enables the assessment of innovation potential and guides the development of sustainable urban environments.

Key words: mega-regions, urban archipelagos, green technologies investments, sustainable economic growth, renewable energy, global economic environment, funding mechanisms.

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