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기후위기 대응력 강화를 위한 탄소중립도시 종합계획 수립 방안 연구

A Study on Carbon Neutral City Planning for Climate Crisis Response

이은석 Lee, Eunseok
김성준 Kim, Sungjoon
지석환 Ji, SeokHwan

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SUMMARY

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Kim, Sungjoon
Ji, Seokhwan

The accelerating trend of climate change is attributed to global warming caused by human economic activities, necessitating an active solution at this critical juncture. Carbon-neutral cities hold significant meaning as environmentally friendly urban policies, aiming to transform cities, major hubs of economic activities and greenhouse gas emissions, into safe and resilient urban environments against future climate disasters. To achieve the proper realization of carbon-neutral cities, we have examined the outcomes and significance of various eco-friendly urban policy projects implemented in South Korea. The evolution of eco-friendly urban policies as a counterbalance to the changing development ideology in our rapidly developing country has been observed. Unfortunately, many instances of eco-friendly city policies, based solely on national financial assistance projects, failed to secure the continuity and sustainability of the projects, falling short of achieving their intended purposes during the planning stage.

Eco-friendly urban policies have been integrated with climate change response issues, leading to the enactment of foundational laws and regulations. However, environmental

and urban projects have grown in a biased manner due to differences in the operating entities and management laws and ordinances of the central government. In other words, the overall framework for climate change response has been led by the Ministry of Environment, which spearheaded the projects. Nevertheless, practical limitations such as ensuring the public interest of financial investments and complying with land-use regulations and standards have hindered the application of climate change-related technologies. Even now, contrary to the intentions of the Ministry of Environment, the logic of financial support by the Ministry of Strategy and Finance, along with a lack of innovation within the current urban planning system managed by the Ministry of Land, Infrastructure, and Transport, makes it challenging to adopt new technological approaches for climate change preparedness. Despite the resolution of longstanding issues at the central government level following the enactment of the Carbon Neutral Basic Act, there remains an ambiguity regarding clear standards for the roles and implementation plans of metropolitan and basic local governments, who are still unclear about their responsibilities in implementing carbon-neutral cities.

Therefore, this study aims to propose eco-friendly solutions to address climate change through a comprehensive plan for carbon-neutral cities. As criteria for presenting a systematic comprehensive plan, this research defines a carbon-neutral city as one that aims for a zero net emission of greenhouse gases through urban space energy efficiency and fostering a mature civic consciousness. The definition emphasizes strengthening a climate-resilient, inclusive city through a carbon-neutral energy supply system, carbon absorption, resource circulation, and climate adaptability. From the perspective of local governments, which are the actual implementers of carbon-neutral city projects, this study establishes and suggests concepts, types, and planning approaches necessary for creating carbon-neutral cities. Additionally, it compiles relevant laws and regulations based on their types and targets.

The planning for carbon-neutral cities necessitates the spatial designation of greenhouse gas emission facilities and specific areas, with the application of suitable planning tools and sequential budget allocation. To foster effective reduction of greenhouse gas emissions and enhance adaptability to the rapidly changing climate, specialized business types tailored to the local context are essential. In this study, four major types of carbon-neutral city models were proposed: those specialized for greenhouse gas reduction, those specialized for climate change adaptation, those

specialized for resource circulation, and those specialized for expanding carbon sinks. It is suggested to designate a business district in areas where urgent problem-solving is required, allowing for the establishment of a comprehensive plan that enables intensive plan application, monitoring, and feedback by combining each specialized approach.

As the inaugural step towards achieving a carbon-neutral society by 2050, the reduction targets outlined in the 2030 Greenhouse Gas Reduction Roadmap are pivotal, clearly stated in Article 8 of the Carbon Neutrality Basic Act. To fulfill the national objectives, the central government, represented by the Ministry of Land, Infrastructure and Transport, and the Ministry of Environment, must prepare for improvements in funding and institutional frameworks for the creation of carbon-neutral cities. In practice, metropolitan municipalities, as the entities responsible for implementing carbon-neutral cities, should continually monitor changes in greenhouse gas emissions characteristics within subordinate local municipalities, considering environmental shifts according to climate change scenarios. Local municipalities should explore specific areas requiring carbon neutrality based on information from metropolitan municipalities, aiming to develop a comprehensive plan for carbon-neutral cities that ensures stable and sustainable project implementation

Keywords :

Carbon Neutral City Policy, Shared Socioeconomic Pathways, Climate-Resilient Development Pathways, Urban Planning, Urban Design, Carbon Neutral Plan