

Exploration on the Coordinated Development Path Between Enterprise Green Operation Modes and Urban Ecological Environment

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Abstract

This paper studies how the green operation modes of enterprises and the urban ecological environment can be developed in harmony. Rather than considering enterprises and cities as independent polluters and passive environmental sinks, this paper believes that they are linked through resource use, industrial structure, infrastructure, governance and goals of public welfare. Based on research in sustainable development, environmental strategy, corporate social responsibility and urban ecological planning, this paper studies the theoretical foundation, interaction path and implementation measures of coordination. Green procurement, cleaner production, circular resource flows, low-carbon innovation and public-private cooperation can be used to connect enterprise reform with urban ecological improvement. Therefore, joint development should change from short-term adherence to the law to a system of value creation. Therefore, the green operation of enterprises is now also expected to promote the construction of an ecologically resilient city and improve the quality of life for residents.

Keywords

Green operation; urban ecological environment; coordinated development; sustainable business model; corporate sustainability; urban governance.

1. Introduction

With the development of industrialisation, urbanisation and consumption-led growth, the connection between corporate development and the ecological environment of cities has gradually become more complicated. Enterprises create jobs, tax revenue, products and technological innovation; however, they also have the following problems: high energy consumption, waste generation, resource depletion, land-use change and ecological risk. In turn, cities provide infrastructure, regulation, a market, labour and policy coordination, but are also subject to environmental damage from concentrated production and consumption. Given the above circumstances, the problem is no longer whether enterprises and cities affect each other, but how to advance joint green development.

The previous mode of thinking has separated economic development and ecological protection. In fact, the two areas do not operate independently; therefore, enterprises have not reduced the external costs of pollution and local governments have not strengthened ecological regulation proactively. Due to climate change, an increase in public awareness of the environment, and the growing demand for a circular economy and urban sustainability at present, the scope of this view is narrowing.

This paper studies the coordinated development path of enterprise green operation modes and the urban ecological environment. Coordinated Action should be used to reduce the dispersal of environmental management and establish an interaction mechanism for enterprises,

industries, urban infrastructure and governance institutions. Based on the above, this essay will first present the theoretical basis of coordination, then analyze the main coupling mechanisms between green operation and urban ecology, and finally put forward practical development paths for achieving long-term synergy.

2. Theoretical Basis of Coordination

The concept of coordinating the green development of enterprises with the ecological environment of cities should be included in the general discussion of sustainable development first. The report of the world commission on environment and development presents sustainability as a model of development that integrates present economic needs with the long-term ecological and social responsibilities [1]. Therefore, we should not choose a single path that sacrifices the ecological system for short-term economic development. It also offers a concept for viewing enterprises and cities as partners in building a common future of development.

At the company level, for a long time, managers have not actively pursued green development due to the trade-off between ecology and economy. Porter and Van der Linde disagree; they do not believe that favourable environmental policies promote innovation, improve resource-use efficiency and boost the overseas competitiveness of a country [2]. Their ideas are also relevant to urban coordination, and stricter ecological requirements do not have to reduce the life of the enterprise. Under suitable circumstances, they can guide the firm to a high-efficiency production and value creation model.

Hart extends the above idea by proposing a natural-resource-based view of the firm and considers the environment as a source of strategic opportunities for building capabilities in pollution prevention, product stewardship and sustainable development [3]. Thus, it can be seen that "green operation" should be regarded as a form of organisation rather than a one-time compliance measure. Companies with ecological consciousness in their capabilities will be more capable of helping the city achieve its goals of environmental protection through self-improvement.

Research has also found some economic advantages of green behaviour empirically. Hart and Ahuja have found that a reduction in emissions can gradually improve the overall performance of a company [4], and Russo and Fouts have determined that, under certain circumstances, good environmental performance is positively correlated with profits [5]. The above studies have shown that not all green investments provide immediate benefits; otherwise, they would have believed that ecological responsibility harms firm performance. Cities will benefit from this and be able to develop in harmony with the long-term development of green enterprise transformation.

Elkington's triple-bottom-line approach offers a more general normative system that seeks to achieve the goals of economy, ecology and society simultaneously [6]. Given the coordination of enterprises and cities, this view can help explain why environmental improvement should not be separated from employment quality, public health, infrastructure efficiency and long-term urban livability. Coordination is thus not solely an environmental problem. It is a problem of multi-level development that includes enterprises, residents, public institutions and the entire urban system.

In theory, the new way of thinking will no longer distinguish between corporate strategy and urban ecology at the corporate level. Green operation is no longer just an internal management reform, and urban ecological protection is no longer limited to the government's control function. Both are components of the entire development logic that mutually promote ecological performance, innovation capacity and social value. For the same reason, there is no need to take separate steps for coordinated paths.

3. Interaction Mechanisms Between Green Operation and Urban Ecology

The first is the mechanism of resource consumption. Enterprises are energy-intensive, water-intensive, land-intensive and raw-material-demanding; cities bear the ecological costs or benefits of processing and distributing these resources. Newman and Kenworthy show that the urban sustainability problem is closely linked to transport and land-use systems, and reducing car dependence and strengthening integration among urban facilities are key directions [7]. The above ideas can be extended to green operation by enterprises; that is to say, through reduced material intensity, enhanced energy efficiency, and support for circular use, enterprises will directly impact the ecological metabolism of the city where they are located.

The second is a mechanism of spatial and infrastructural coupling. Beatley's research on green urbanism indicates that in the planning of ecological urban development, mobility, green spaces, building systems and environmental design all need to be considered [8]. Enterprises do not operate outside of this space logic. The chosen location of the site, logistics system, supply path, waste-treatment facility, industrial clustering, etc., all affect the environment of the city. Therefore, the green operation needs to be connected with the urban ecological infrastructure and cannot be realised at the factory gate alone.

A third way is business model innovation. Schaltegger, Lüdeke-Freund and Hansen believe that to promote corporate sustainability, the business model should be reformed to create environmental and economic benefits simultaneously; thus, pollution will no longer be reduced [9]. Strengthen cooperation between enterprises and cities to address environmental problems in the production, distribution and use stages at the city level. Leasing models, service-based systems, reverse logistics, recycling partnerships and low-carbon product strategies can reduce the ecological footprint of the city and open new revenue streams for enterprises.

A fourth mechanism is systemic learning and transition. Geissdoerfer, Vladimirova and Evans study sustainable business model innovation as a type of organisational change and broader sustainability transition [10]. Therefore, the idea of urban ecology for enterprises should be expanded to include alterations in consumption behaviour, infrastructure and service systems, etc., rather than just pollution reduction. Green operations have been increasingly emphasized in recent years as enterprises help to improve the environment of urban life through changes in mobility, reduced energy consumption, promotion of material circulation, etc., and increase public environmental awareness.

The fifth is a digital and governance-integrated model. Albino, Berardi and Dangelico identify the repeating features of smart-city projects as technology, infrastructure, governance, performance measurement and sustainability [11]. Link enterprise green operations with urban data systems and environmental disclosure platforms to build carbon accounting and resource-monitoring networks that improve the measurability and manageability of ecological coordination. Thus, the connection between the company and the city is also in terms of information. Good cooperation should have a shared sense of responsibility and common norms.

The above mechanisms show that the enterprise's green operation and urban ecology are connected in many ways besides pollution control. They are connected by flows of materials, infrastructure, institutions, information and value creation. Thus, the degree of coordination will depend on whether the enterprises and cities continue to provide fragmented responses or move towards an all-encompassing model of ecological governance and economic development.

The other is institutional expectation. Urban ecological goals are set in planning by the public for environmental standards and due to cross-border cooperation; enterprise responses are driven by investment logic, supply chain demands and market reputation. When the expectation of the city is in line with this, it will be easier for the company to achieve its

ecological goals, and the city will be well-positioned to promote the green transformation under a stable policy environment. Coordination thus requires the formation of physical systems and, at the same time, aligned development goals for enterprises and cities.

The next one is a mechanism for urban-scale industrial symbiosis. Enterprises in the same industrial park can be used to exchange heat, water, by-products, logistics facilities and environmental services, thus reducing operating costs and the demand on municipal treatment facilities. Such cooperation needs more than a two-party agreement by the companies. Space planning, technical standards, reliable information and institutions with the ability to identify compatible materials and energy flows are all relevant. When cities offer shared facilities and businesses have resource demands and surpluses, some gains in efficiency are environmentally friendly. This way, the company's green operations will directly address urban metabolism issues and turn the problem of industrial concentration into a platform for circular resource use [7, 8].

4. Coordinated Development Paths

The first development path is the transition from end-of-pipe treatment to source-oriented green operation. The sustainable development system put forward by the World Commission on Environment and Development and the innovation logic promoted by Porter and van der Linde jointly suggest that prevention is more effective than remedial measures [1, 2]. Therefore, the company will modify its production process, procurement system, packaging and energy structure to reduce ecological pressure at the source. Therefore, cities will have a reduced regulatory and infrastructure burden for the downstream treatment and remediation.

A second way is capability building in terms of the natural-resource-based view. Based on Hart's system, pollution prevention, product stewardship and sustainable development are not individual environmental policies but interrelated strengths [3]. The city government will offer some specific regulations, green finance, an industrial service platform and ecological performance standards for this transition. The company will build an internal system and, with the support of city institutions, strengthen coordination to reduce the frequency of isolated efforts.

The third is to offer economic incentives for the high-return environmental improvement. Hart and Ahuja, as well as Russo and Fouts, have shown that under certain circumstances, the improvement of the environment will lead to continuous performance improvement [4, 5]. Therefore, the urban policy will not only be punitive. Promote clean production, low-carbon innovation, waste exchange and market rewards for green performance. A joint system will be more effective if the company's environmental efforts align with its strategic objectives and are not driven by a sense of duty.

The fourth way is triple-bottom-line governance. Elkington's system helps us understand that coordinated development should be judged on the basis of economic feasibility, environmental quality and social benefits simultaneously [6]. Therefore, the system of evaluations needs to integrate corporate emissions, labour conditions, community health, land use efficiency and other public service outcomes. Such governance does not promote shallow greening but rather fosters forms of enterprise behaviour that contribute to urban well-being in an all-around manner.

The fifth way is infrastructure-based ecological cooperation. Newman and Kenworthy and Beatley have both shown that the construction of a sustainable city requires an all-encompassing system for mobility, land-use planning, waste-disposal and environmental protection [7, 8]. Therefore, the company will be added to the urban ecological infrastructure through industrial symbiosis, shared logistics, renewable energy integration, reclaimed water

systems and coordinated waste recovery networks. Thus, the cities will no longer be passive recipients of industrial externalities but active hubs for green transformation.

A sixth path: sustainable business model innovation. Schaltegger and his colleagues, as well as Geissdoerfer and his colleagues, both believe that in order to achieve deep-seated and enduring changes, we need to redesign how value is created and realised rather than optimising the existing process [9, 10]. Construct service-oriented models, advance remanufacturing, implement extended producer responsibility, establish shared platforms and circular partnerships, reduce the ecological footprint of urban areas, and open up new competitive spaces for enterprises. The above changes can be promoted by urban authorities through procurement standards, pilot zones, public-private partnerships and open environmental innovation ecosystems.

The seventh path is data-enabled and platform-based coordination. Albino and others believe that the intelligent urban system requires an all-encompassing information system, good performance indicators, and sound governance [11]. The city will construct an ecological information platform to integrate enterprise disclosures, carbon inventories, waste-flow data and environmental monitoring for more precise intervention and public accountability. Through this system, the company will be able to learn about other people's achievements and coordinate supply chain cooperation for joint ecological improvement initiatives.

The eighth way is the creation of a shared urban ecological culture. Coordinated development is not the result of technical modification alone. It also depends on whether green operation will be part of the new urban economic system. Enterprises mould consumer behaviour and set supplier standards; cities form public expectations and provide institutional legitimacy. When ecological responsibility is reflected in the business's reputation and local governance and daily urban life, coordination among different enterprise types and the goals of urban ecological civilization become more solid and self-reinforcing.

Collectively, the above paths suggest that coordination should be viewed as an extended transition process rather than a singular policy result. Coordinated Strategies by enterprises, urban governance, infrastructure, markets and social demands are needed. The closer these factors are, the higher the probability that green operation and ecological urban development will move from a state of conflict to cooperation.

These paths have good practical value because they are combinable. The programs and policies of individual enterprises or cities alone cannot achieve sustained cooperation. Source reduction without infrastructure support is limited; data platforms lacking a business model change are superficial; and cultural advocacy without incentives is weak. Good cooperation can be achieved between enterprises and cities to promote the development of an all-weather green production and urban life system.

5. Conclusion

Coordinated development of the green-operation model for enterprises and the ecological environment of cities is a problem that links economic reform with environmental quality and urban sustainability. Enterprises are not just the subjects of regulation in the city, and the city is not a passive stage for corporate activities. Each creates the conditions in which the others will be realised or not realised. Therefore, the joint development of these areas should move away from independent environmental protection and be realised through integrated ecological-economic governance.

This paper has put forward several interrelated reasons for such coordination: source-oriented green operations, capability-based environmental strategies, incentive alignment, triple-bottom-line governance, infrastructural collaboration, sustainable business model innovation, data-enabled governance and a shared ecological culture. The above paths are necessary to turn

the idea of environmental responsibility into a system of value creation for the company, the city and society.

Thus, enterprise green operation is no longer solely the responsibility of internal management. It will also be one of the reasons for building urban ecological resilience and environmental governance capacity. Therefore, the long-term aim is to construct an institutional system that promotes the cooperation of enterprise reform and urban ecological progress, rather than opposing each other at the structural level.

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