

Overview and Enlightenment of Green Manufacturing Research

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Abstract: At present, China is in the period of economic transformation from high-speed development to high-quality development, and the balance of economic development, environmental protection and social harmony has gradually become the focus of attention from all walks of life. Therefore, green manufacturing is not only a powerful tool for the development of manufacturing industry, but also the inevitable trend of the development of the new industrialization road. This paper further clarifies the connotation of green manufacturing, sorts out and analyzes the current situation and development trend of green manufacturing at home and abroad, discusses the important role of green manufacturing and its ability improvement in the sustainable development of enterprises, and provides theoretical support and practical reference for green manufacturing innovation of enterprises.

Keywords: Green manufacturing; Manufacturing industry; Development strategy.

1. Introduction

China is a big manufacturing country with a complete manufacturing system. However, China's current production mode has not been completely changed. There are the characteristics of a large amount of investment, more resource consumption and more waste discharge, which has a significant gap compared with the advanced level of developed manufacturing powers. In order to ensure the realization of 2030 years ago carbon peak target based on the new stage of development, realize the goal of "double carbon", leave the green manufacturing technology and green development, this paper, on the connotation of green manufacturing, green manufacturing research situation and development trend on the basis of green manufacturing and its ability to promote the important role of enterprise green development, aims to actively carry out green manufacturing innovation to provide theoretical support and practice basis.

2. Overview of Green Manufacturing Research

2.1. The definition of green manufacturing

Green manufacturing is a kind of modern mode of production, it should not only consider the impact on the environment, and to consider the consumption of resources, in order to realize the product from the design, production, packaging, transportation, use to the recycling product life cycle, minimize the adverse impact on the environment, maximize resource utilization efficiency, realize the enterprise economic, social, ecological three aspects of comprehensive benefit[1].

2.2. The development of green manufacturing

2.2.1. Foreign green manufacturing development

The "Green Power Partnership Plan" formulated by the US Environmental Protection Agency and the "National Energy Plan" formulated by the Ministry of Commerce aim to provide exchange information on green manufacturing for the US manufacturing industry and jointly promote the full implementation of in green manufacturing[2]. The German

government formulated the German Industry 4.0, in which the Resource Efficiency Production Plan puts the resource efficiency in the focus of the industry 4.0 stage, and puts forward the future industrial goals, namely, to improve the sustainable development capacity and improve the competitiveness[3]. The British government issued the "made in Britain 2050" and "high value manufacturing strategy", including the future manufacturing report forecast, in 2050, the world population will grow from 7 billion to 9 billion, at that time, the demand for industrial products will double, demand for raw materials and resources will reach three times now, therefore, in order to cope with the future population, environment and resources challenges, formulated the 2013-2050 sustainable manufacturing development roadmap[4]. Japan gave great attention to the development of green manufacturing, issued the green revolution and social revolution, in 2008 and issued the action plan for the construction of low carbon society, 2012 national strategic development conference passed the green development strategy planning, put forward the new equipment manufacturing, machining and other green manufacturing development direction, and the energy conservation and environmental protection cars, large battery, Marine wind power as the implementation of the green development strategy of the three pillar industries[5].

2.2.2. Domestic green manufacturing development

In May 2015, the State Council issued the "made in China 2025", put forward "promoting green manufacturing", the implementation of "green manufacturing plan", has been clear about the "strengthen research and development of energy conservation and environmental protection of advanced technology, technology and equipment, promote the green transformation and upgrading of manufacturing", "vigorously promote low carbon, recycling and intensive, improve the utilization of manufacturing resources: strengthen the whole life cycle of product green management, efforts to build an efficient, clean, low carbon, circular green manufacturing system" the overall development of ideas[6]. In the enterprise level, Lin Lu based on dynamic theory and the inner relationship of manufacturing green transformation, it is concluded that the green transformation of manufacturing

enterprises is the result of enterprise multi-stage transformation, finally from the thought, policy support, digital authorization, financial services security system, communication and cooperation put forward the specific Suggestions to promote the green transformation of manufacturing enterprises[7]. Shi Chen et al. based on the panel data of the listed manufacturing enterprises in China from 2011 to 2019, the research found that digital transformation can promote the green development of manufacturing enterprises, and digital transformation promotes the green development of manufacturing enterprises by improving the three intermediary paths of green product output, technological innovation level and green investment level. In addition, the promoting effect of digital transformation on the green development of enterprises will also be regulated by the heterogeneous effects of environmental uncertainty. Therefore, to accelerate the digital development of enterprises and promote the construction of digital China is conducive to the green development of enterprises, and finally to realize the common development of digitalization and greening[8].

2.3. Green manufacturing system

Li Yanyuan said that as an important development direction of China's manufacturing power, green manufacturing can effectively improve the overall competitiveness of enterprises, reduce the environmental problems faced by enterprises in the development, and has a broad space for development. However, due to the lack of a complete and systematic theory and methods of green development technology in China, many enterprises have not applied it to the actual production of [9]. Wang Xigang, Wang Mengjie, China's manufacturing energy consumption is high, and the role of manufacturing in energy conservation protection is relatively weak, therefore, China needs to strengthen the study of green manufacturing system and build, and build the corresponding evaluation index system, and on the basis of further improve the government reward and punishment mechanism of the enterprise[10]. Mao Yongqiu of the current industrial park of green manufacturing system is studied, put forward to establish a green manufacturing system, we must make the whole production process greening, the Chinese enterprise green manufacturing cost, the enterprise enthusiasm is not high, should guide Chinese enterprises conform to the trend of green development, starting from the needs of the national economic development, with the core problem of green products as the breakthrough point, improve the green degree of production equipment, the green development ideas into the enterprise social responsibility system[11]. ZhaiLu, Zhao Yantong from the business environment, science and technology drive, green manufacturing three aspects discusses the "binary" new development pattern of manufacturing development of high quality, China should through the industrial structure upgrade to build green manufacturing system: to learn the successful experience of global manufacturing power, create a better business environment, strengthen the protection of intellectual property rights, promote the green manufacturing system and intelligent manufacturing system, improve the international competitiveness of green manufacturing[12].

3. Conclusion

Nowadays green manufacturing has become the inevitable trend. As a new technology, new form of business and new

mode of green manufacturing, has become an important new field in the world's fourth industrial revolution and the fourth scientific and technological revolution. It has become an important tool for the high-quality development of the national economy and society, the engine of the transformation and innovation development of enterprises, and the carrier of the green performance improvement of enterprises. Under the new normal, China's comprehensive promotion of green manufacturing is an important way to solve the problems of economic growth and ecological environment disharmony brought about by industrialization. Thus, in the era of digital and intelligent, enterprises as the main body of a kind of economy, the use of artificial intelligence to green production, and in the process of the coordinated development of both, continue to improve the enterprise ecological benefit, social benefit and economic performance and their high quality development ability, this is an important theoretical and practical basis of the development of modern enterprise.

Research shows that green manufacturing as a new technology, new forms and new mode, is becoming the fourth global industrial revolution and fifth revolution important emerging areas of technology, as well as the commanding heights of the world economic growth and core competitiveness development green manufacturing will promote a new round of technological innovation and revolution in our country, is the development of economic quality.

China's economy and society is in a critical period of transformation and upgrading, fully implementing green manufacturing is particularly important and urgent attaches great importance to green manufacturing strategy manufacturing top design is important, seeding more valuable yellow green manufacturing is not only an engineering technology, but also industrial enterprise green manufacturing practice and its performance ability and competitiveness of economic means.

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