

# Exploration of Teaching Reform in Talent Cultivation for Carbon Peak and Carbon Neutrality

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**Abstract:** This paper explores innovative approaches to cultivating talent in carbon peaking and carbon neutrality within the field of economic management. It begins by analyzing the current state of talent development and sets targeted course objectives: First, to enhance students' ability to master and apply carbon neutrality technologies through the study and understanding of relevant knowledge; Second, to strengthen teaching through various methods, guiding students to continuously improve their professional competence; Third, to emphasize case-based teaching, enabling students to gain practical experience and improve their problem-solving skills. The curriculum for carbon neutrality talent emphasizes the integration of theory and practice, with innovative content that combines fundamental and cutting-edge theories of carbon neutrality. Climate change economics simulation training is incorporated to help students better understand and apply the knowledge required for energy conservation and emissions reduction. The course content spans multiple fields, including politics, economics, culture, society, and science and technology. It guides students in analyzing how the international community collectively addresses global climate change. Starting from the scientific realities, theoretical foundations, and policy bases of climate change and the goals of carbon peaking and neutrality, the course explores pathways to achieving these goals, the development of carbon trading markets, the research and development of relevant technologies, and the formulation of supporting policies. This comprehensive approach aims to improve students' overall competence in the carbon peaking and carbon neutrality fields and to contribute to the development of a low-carbon economy.

**Keywords:** Carbon peak; Carbon neutrality; Teaching reform.

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## 1. Introduction

With the global climate crisis becoming increasingly severe, countries worldwide are striving to achieve carbon peak and carbon neutrality goals. The field of economics and management now places greater emphasis on cultivating students' innovative thinking and practical skills to meet societal demands. Addressing how to effectively train innovative talent in carbon neutrality has become an urgent issue in teaching reform. This paper examines the current state, goals, and strategies for talent cultivation in carbon peak and neutrality, offering insights and references for educational reform.

## 2. Current State of Talent Cultivation in Carbon Neutrality

In response to carbon peak and neutrality goals, universities and research institutions worldwide have introduced relevant courses. For instance, the University of Edinburgh offers a master's program in Carbon Capture and Storage<sup>[1]</sup>. Companies such as ExxonMobil in the U.S. have established research centers for carbon capture technology<sup>[2]</sup>. Governments globally have increased financial and policy support, such as the European Union's investment of over 100 billion euros into the development and application of carbon neutrality technologies<sup>[3]</sup>.

However, the content and methods of existing courses are relatively uniform, lacking specificity and practicality to meet real-world needs. Universities must innovate and integrate teaching content and methods, enhance interdisciplinary and international collaboration, and foster the development and application of carbon neutrality technologies.

## 3. Goals of Carbon Neutrality Talent Cultivation

Traditional embroidery art still has wide application value in contemporary fashion design. For modern fashion design, it still has a very strong sound. First of all, we need to break the integrity of the design. Traditional embroidery art is often lack of abstractness, and the pattern image is very complete, but it has the characteristics of rigidity. It is not conducive to the long-term promotion of traditional ideas, and modern fashion design in the process of integration must break through the limitations of traditional embroidery, the integrity of the continuous to be broken, in order to innovate. For fashion designers, we can divide the patterns properly and pick up the relevant composition methods to make them more in line with modern people's clothing aesthetics. For example, when designing a dress, you can combine embroidery art to form a hollow way, so as to decorate the waist line and make the design effect of the whole curve more prominent. The second is to strengthen the aesthetic level of clothes and make them more in line with people's understanding of beauty. Traditional embroidery art is rooted in traditional culture, so the pattern is very exquisite and meticulous, which makes embroidery art unique and coquettish. It can enhance the aesthetic feeling of modern fashion design, so as to optimize contemporary fashion design. At present, many designers will actively try embroidery techniques in the process of design, so as to enhance the artistic value of clothing design, and even properly use embroidery techniques in foreign high-definition clothing, so as to further improve the quality of clothing.

The curriculum focuses on understanding carbon neutrality, its economic and social impacts, and the challenges involved. Covering fields such as politics, economics, culture, society,

and technology, it guides students in analyzing global climate change, scientific realities, theoretical foundations, and policy bases of carbon neutrality. Specific objectives include:

(1) Broadening Global Perspectives and Acquiring Frontier Knowledge

Students gain insights into international progress and issues in carbon neutrality through academic studies, curated reading lists, and relevant journals.

(2) Understanding Economic and Managerial Applications of Carbon Neutrality

Students learn about the role of carbon neutrality strategies in economic activities, including climate change impacts on economies and corporate measures to achieve carbon neutrality.

(3) Analyzing Carbon Neutrality Across Three Levels

Students explore individual, corporate, and national perspectives, integrating knowledge from economics, politics, sociology, and psychology to analyze low-carbon economic phenomena comprehensively.

(4) Applying Economic Theories to Solve Practical Problems

The curriculum equips students with the ability to identify, analyze, and propose solutions to challenges related to climate change and carbon neutrality.

Students are expected to develop a comprehensive understanding of the implementation pathways of low-carbon development across various application domains, including low-carbon cities, low-carbon rural areas, and low-carbon campuses. The curriculum aims to deepen students' knowledge of the low-carbon economy, enhance their awareness of environmental protection, and foster a strong sense of social responsibility. Furthermore, students are encouraged to actively apply and innovate upon these principles in future research endeavors and practical production activities to analyze and solve real-world problems.

(5) Enhancing Skills Through Collaborative Education

By leveraging teaching platforms, professional practice bases, and alumni networks, students engage with enterprises and society to build awareness and skills in energy conservation and emissions reduction.

The course is designed to cultivate students' ability to

internalize externalities and improve the efficiency of ecological resource utilization. By employing environmental protection mechanisms to address incentive and constraint-related issues, students are guided to critically examine the deepening relationship between economic development and pressing challenges such as population pressure, resource scarcity, and environmental degradation. This process enables students to construct well-reasoned arguments in support of carbon neutrality policies, fostering a comprehensive understanding of the economic rationale behind energy conservation and emissions reduction. Ultimately, the course aims to help students develop a harmonious ethical perspective that integrates economic thinking with environmental sustainability.

## 4. Features of the Carbon Neutrality Curriculum

(1) Integration of Theory and Practice

Theoretical frameworks provide foundational insights into economic activities, while practical case studies of national policies and corporate initiatives enhance students' analytical and problem-solving capabilities.

(2) Innovative and Comprehensive Content

Balancing foundational and cutting-edge knowledge, the curriculum incorporates textbooks, multimedia presentations, documentaries, and simulated exercises. The course covers major topics such as energy transition (fossil and green energy), technological means (carbon reduction and CCUS technologies), carbon markets (trading and financing tools), and case studies (low-carbon buildings and communities). It comprehensively explains the basic concepts and implementation paths of carbon peaking and carbon neutrality, enabling students to accurately grasp the cutting-edge research fields at home and abroad.

(3) Climate Economics Simulation Training

Through interactive simulations, students gain practical skills in implementing carbon neutrality projects. By experiencing the interplay between climate change, economic development, and human behavior, they develop insights into emission reduction strategies and industry-specific roles for career planning.

**Table 1.** Course Design for "Carbon Peak and Carbon Neutrality"

Module	Topics	Case Studies	Key Points and Challenges
Introduction	Global climate change, international/national responses Definitions of carbon peak and neutrality	China's carbon peak and neutrality	Key Point: Understanding low-carbon economics. Challenge: Principles of climate change.
Theory	Economics, system theory, ecology, energy studies	Renewable and hydrogen energy cases	Key Point: Applications of ecological science. Challenge: Biomass energy applications.
Policies	Low-carbon policies across countries and regions	U.S. green building technologies	Key Point: Familiarity with policy frameworks. Challenge: Energy-efficient construction.
Green Energy	Fossil fuel innovations, renewable energy technologies	China's new energy vehicles	Key Point: Energy structures and economics. Challenge: Diverse renewable technologies.
Green Cities	Definitions, construction pathways for green cities	Japanese evaluation metrics	Key Point: Green city concepts and examples. Challenge: Carbon accounting principles.
Green Industry	Energy-saving in heavy industries, green transport	High-energy enterprise transitions	Key Point: Green industrial transformations. Challenge: Carbon sequestration technologies.
Green Finance	Carbon taxation, trading, and green financial instruments	EU carbon trading systems	Key Point: Financing mechanisms for green projects. Challenge: Carbon trading impacts.
Simulation	Climate crisis simulation	Climate-related scenarios	Key Point: Economic impacts of climate change. Challenge: Balancing growth and emissions.

## 5. Course Content of Carbon Peak and Carbon Neutrality

The course spans a wide range of disciplines, including politics, economics, culture, society, and science and technology. It guides students in analyzing the international community's collective response to global climate change. Beginning with the scientific realities, theoretical foundations, and policy frameworks of climate change, carbon peaking, and carbon neutrality, the course systematically explores the pathways toward achieving carbon peaking and neutrality. It further examines the implications of these goals for industrial development and social life, the construction of carbon trading markets, the research and development of carbon-related technologies, and the formulation of relevant public policies.

The course comprises eight modules, as outlined in Table 1. Before class, students receive targeted questions through a learning platform to facilitate pre-class thinking, enabling more dynamic classroom discussions.

## 6. Conclusion

Addressing global climate change is poised to exert profound impacts on the contemporary world. Low-carbon and decarbonization initiatives are expected to drive a fundamental restructuring of global strategic industrial supply chains, challenging existing economic systems. In the long term, green, low-carbon development and sustainable lifestyles will become the dominant paradigm shaping future societal norms and everyday life.

The multidisciplinary nature of economics and management positions it to play a vital role in advancing

carbon peak and neutrality strategies. The proposed curriculum fosters students' understanding and application of carbon neutrality concepts, equipping them with practical and innovative capabilities to contribute to low-carbon economic development.

## Acknowledgements

The authors gratefully acknowledge the financial support from Guangxi Science and Technology Plan Project "Research on the Integrated Energy Saving Service Model of Carbon Trading Quota and Contract Energy Management for Enterprises in Guangxi China" (Project Number: Guike AD23026244); The Project Aimed at Enhancing the Scientific Research Basic Abilities of Young and Middle-aged Teachers in Universities in Guangxi China "Research on the Coordination Mechanism of China's Provincial Carbon Peaking Policies from the Perspective of Development Right" (Project Number: 2023KY0026).

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