Practical Exploration and Development Trends of Scientific Journals in the Coal Industry Serving the "Dual Carbon" Goals

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Abstract

[Objective] This study explores strategies for coal field scientific journals to serve the "dual carbon" goals and contribute to China's "dual carbon" objectives from a journal perspective. [Method] Employing case analysis, this paper examines the core journal "Coal Conversion" in the coal field, elaborating its strategies for serving the "dual carbon" goals from two dimensions: practical exploration and development trends. [Results] "Coal Conversion" aligns with national "dual carbon" strategic needs, serving discipline development in the coal field and technological innovation in coal enterprises through expanding topic selection scope, planning hot-topic special issues, emphasizing achievement transformation, and enhancing WeChat promotion. [Conclusion] To further serve the "dual carbon" goals, "Coal Conversion" should improve its development quality by diversifying planning methods for special issues, columns, and topics, enhancing precise user service, and exploring video channel operation.

Full Text

Practice and Development Trends of Scientific Journals in the Coal Sector Serving the "Dual Carbon" Goals: A Case Study of *Coal Conversion*

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Abstract:
[Purpose] This paper explores strategies for scientific journals in the coal sector to serve the carbon peak and carbon neutrality goals (the "dual carbon" goals),

aiming to contribute to China's national objectives from the perspective of academic publishing. **[Methods]** Using case analysis, this study examines *Coal Conversion*, a core journal in the coal sector, and elaborates on its strategies for serving the "dual carbon" goals from two dimensions: practical exploration and future development trends. **[Findings]** *Coal Conversion* closely follows the national "dual carbon" strategy by expanding its scope of topics, planning hot special issues, emphasizing achievement transformation, and improving WeChat promotion to serve disciplinary development in coal science and technological innovation in coal enterprises. **[Conclusions]** *Coal Conversion* must further enhance its development quality by diversifying special issue/column/topic planning methods, improving precision service for users, and exploring video account operations to better serve the "dual carbon" goals.

Keywords: Scientific journals; "Dual carbon" goal; Coal sector; Publishing practice

The realization of China's "dual carbon" goals is primarily influenced by factors including a large carbon emission base, economic and social development stages, and energy resource endowment characteristics [1]. As the world's largest source of carbon emissions, coal has long dominated China's energy structure, making the achievement of "dual carbon" goals intimately related to the coal sector. With the introduction of policies such as the "Opinions of the CPC Central Committee and the State Council on Completely, Accurately and Comprehensively Implementing the New Development Philosophy to Achieve Carbon Peak and Carbon Neutrality" and the "Action Plan for Carbon Peak Before 2030," the coal sector's gradual transition toward green and low-carbon development will inevitably generate numerous new concepts, technologies, equipment, and achievements, presenting a favorable opportunity for the development of scientific journals in the coal sector. A CNKI search reveals that after the proposal of the "dual carbon" goals (post-September 2020), journal professionals in the coal sector have conducted multifaceted practices and explorations regarding journal development. For example, studies have explored cluster operation models and construction paths for scientific journals using the China Coal Society journal group as a case [2-3]; investigated group development paths and editorial talent cultivation for scientific journals through the China Coal Research Institute Publishing and Media Group [4-5]; examined construction paths and effectiveness for high-quality Chinese scientific journals using *Coal Science and Technology* as an example [6]; analyzed strategies for enhancing academic brand influence and evaluated the social benefits of the "Carbon" brand using *Clean Coal Technology* [7]; identified problems and innovative practices in the development of *Shaanxi Coal* [8]; introduced the journal operation practice of *Surface Mining Technology* in close integration with society work [9]; and studied strategies for promoting integrated development of groupization, digitalization, and specialization in post-pandemic journal publishing using *China Coal Industry* as an example [10]. These practical explorations have directly or indirectly contributed to advancing China's "dual carbon" goals while enhancing publication quality.

In addition, to serve China's "dual carbon" vision and facilitate the dissemination and transformation of new achievements in the coal industry, *Coal Conversion*, a core Chinese journal in coal chemical engineering, has actively implemented practices and prospects in recent years. The following analysis of its practical pathways and development trends in serving the "dual carbon" goals aims to provide references for improving service quality of scientific journals in the coal sector.

1. Practice of *Coal Conversion* in Serving the "Dual Carbon" Goals

Coal Conversion, supervised by Taiyuan University of Technology and co-sponsored by the State Key Laboratory of Efficient and Clean Coal Utilization (Taiyuan Institute of Coal Chemistry, Chinese Academy of Sciences), is a core Chinese journal that primarily publishes research and development achievements in coal processing and conversion, falling under the category of applied chemical engineering. According to the "2022 High-Quality Scientific Journals in the Coal Sector Grading Directory" [11], *Coal Conversion* ranks at Tier T2, holding considerable influence among coal sector journals. The proposal of the "dual carbon" goals has provided development opportunities for *Coal Conversion*, which has closely followed national strategy and implemented the following measures to serve disciplinary development and technological innovation in coal enterprises, thereby contributing to the "dual carbon" goals.

1.1 Focusing on "Dual Carbon" Hotspots and Expanding Topic Scope

The correct orientation of scientific journals is crucial for the healthy development of scientific endeavors, and journal scope must align with national strategic policies. First, *Coal Conversion* recognized that limitations in its topic scope would result in the absence of "dual carbon"-related submissions. Therefore, the journal closely followed "dual carbon" policies, identified key technical and engineering issues closely related to coal industry development, compared them with existing scope and actual manuscript sources, and expanded its coverage. For instance, Carbon Capture, Utilization, and Storage (CCUS) technology is currently the only key technology capable of achieving low-carbon utilization of fossil energy and low-carbon emissions from industrial processes such as thermal power, cement, and steel [12]. The "14th Five-Year Plan and 2035 Long-Range Objectives Outline" explicitly designates it as a major demonstration project for guidance and support, while the "Opinions of the CPC Central Committee and the State Council on Completely, Accurately and Comprehensively Implementing the New Development Philosophy to Achieve Carbon Peak and Carbon Neutrality" lists it as an important technical means for achieving "dual carbon" goals for the first time. With continuous support from national science and technology programs including the National Natural Science Foundation, National Key Basic Research Program, National High-tech Research and Development Program, and National Key Research and Development Program,

CCUS technology has achieved numerous breakthroughs [13]. Through policy interpretation, *Coal Conversion* recognized its insufficient coverage of CCUS technology and subsequently included it in its scope. Second, the journal also leveraged its editorial board and young academic committee members in determining topic scope. Through editorial board meetings, WeChat groups, and telephone communications, *Coal Conversion* discussed specific issues such as topic scope, column setup, and directions for soliciting review articles with editorial board and young academic committee members, requiring each member to submit proposals that were then selected and optimized through editorial board meetings. Ultimately, topics were expanded to include coal-based new materials and applications, low-carbon comprehensive utilization of coal-related resources, dual-carbon effects and carbon capture utilization storage, synergistic conversion of coal with biomass or organic solid waste, and application of artificial intelligence in coal conversion processes, forming a coherent thread of "What is coal?" "How to use coal?" and "How to solve resource and environmental problems in coal utilization." The journal has solicited and organized manuscripts around key topics, publishing research on oxygen-enriched pulverized coal combustion, blast furnace-gasifier coupled processes, coal-to-oil and petroleum technology, and utilization of coal-based carbon materials, addressing both coal conversion technologies and environmental issues while demonstrating academic and dissemination value in generating social and environmental benefits. Additionally, beyond research articles, *Coal Conversion* has proposed soliciting contributions from renowned research groups and scholars on important areas or scientific and engineering problems in coal conversion processes.

1.2 Grounded in the "Dual Carbon" Strategy, Planning Hot Special Issues

Grounded in the "dual carbon" strategy, *Coal Conversion* established a 思路 (approach) for publishing special issues based on disciplinary hotspots. On one hand, given China's energy endowment and the basic scenario of long-term dependence on coal-dominated fossil energy consumption during the carbon peak phase [14], the clean and efficient conversion and utilization of coal holds strategic significance for building a clean, low-carbon, safe, and efficient energy technology system and achieving "dual carbon" goals. Consequently, *Coal Conversion* identified "Clean and Efficient Coal Utilization" as a special issue topic. Special issues primarily absorb high-quality manuscripts by selecting special issue editors-in-chief with high academic attainment and influence. The special issue on this topic received nearly 30 approved submissions. On the other hand, green combustion represents a combustion mode with high efficiency and low pollutant emissions during coal combustion, and its application has become an inevitable trend under the "dual carbon" background. Therefore, *Coal Conversion* identified "Combustion Science" as another special issue topic. The planning involved contacting organizers of the Combustion Science Academic Annual Conference of the Chinese Society of Engineering Thermophysics to become a cooperative journal and inviting the conference program committee

chair to organize contributions. The conference committee ultimately recommended 44 manuscripts after preliminary review. Through these two planning approaches, *Coal Conversion* published two special issues each on "Clean and Efficient Coal Utilization" and "Combustion Science." In terms of research institutions, contributions came not only from renowned universities such as Tsinghua University, Zhejiang University, Huazhong University of Science and Technology, Xi'an Jiaotong University, and China University of Mining and Technology, but also from key research institutes including Beijing Low-Carbon Clean Energy Research Institute, National Engineering Research Center for Direct Coal Liquefaction, and CHN Energy Science and Technology Research Institute. The scope of contributing institutions expanded to top-tier universities and research institutes. Regarding funding sources, the proportion of funded papers reached 85%, with nearly 50% supported by national funds, demonstrating that special issue planning can channel high-level research achievements from teams addressing national strategic priorities into Chinese scientific journals to serve the "dual carbon" goals. Additionally, through special issue publication, *Coal Conversion* explored the practice of cooperating with academic societies, leveraging their expert resources, conference platforms, and academic exchange functions to broaden manuscript sources and enhance academic quality, thereby accumulating experience for further development.

1.3 Centering on "Dual Carbon" Actions, Emphasizing Achievement Transformation

Under the "dual carbon" goals, coal enterprises have gradually become the main entities responsible for implementing green transformation, fulfilling emission reduction commitments, ensuring energy security, and promoting intensive production, making breakthroughs in green technological innovation a crucial task. To this end, *Coal Conversion* investigated and tracked the transformation (enterprise collaboration) of applied research achievements and solicited contributions from research groups with transformation outcomes, focusing on solving practical problems in coal enterprises and highlighting new technologies, processes, and achievements. Through solicited contributions, author affiliations expanded from universities and research institutes to key coal enterprises such as Sinopec Refining Engineering (Group) Co., Ltd., Zhongke Coal Chemical Clean Energy Co., Ltd., China Shenhua Coal-to-Liquid and Chemical Co., Ltd., GD Power Development Co., Ltd., Beijing Shougang Co., Ltd., and Shaanxi Yanchang Petroleum (Group) Co., Ltd., extending research achievements from laboratory results to industrial trial outcomes. In the process of energy transformation driven by technological innovation, two aspects warrant particular attention: the impact of technological innovation on energy efficiency and its effect on new energy development costs [15]. Through reviewing enterprise submissions, the journal found that enterprise research on process optimization, cost comparison, economic analysis, and integrated solutions better aligns with actual production, providing experience and references for solving practical problems while reducing both carbon emissions and costs to achieve unity of environmental

and economic benefits. For example, the enterprise-authored paper "Sensitivity Analysis and Optimization of Thermal Economy for Coal Gasification Systems with Coal-Water Slurry Preheating Technology" conducted sensitivity analysis and optimization studies on thermal economy, providing references for the design and selection of coal-water slurry preheaters, helping expand application prospects for clean coal gasification technology and promoting clean and efficient coal utilization to achieve China's "dual carbon" goals [16]. Additionally, statistics on enterprise submissions to *Coal Conversion* show that the enterprise submission rate has gradually increased since the proposal of the "dual carbon" goals, reaching 22% in both 2021 and 2023, reflecting growing attention to and coverage of achievement transformation under the "dual carbon" background.

Table 1 Enterprise Submission Rate of *Coal Conversion* (%)

1.4 Focusing on the "Dual Carbon" Goals, Improving WeChat Promotion

Coal Conversion focuses on providing knowledge services through academic publishing to achieve the "dual carbon" goals and actively explores feasible dissemination methods that integrate print and online platforms. Among various new media channels for journal dissemination, WeChat official accounts, with their large user base and widespread application, require continuous improvement in promotion methods. Focusing on the "dual carbon" goals, *Coal Conversion* has made several attempts. First, the primary path to increasing WeChat followers remains disseminating high-quality original articles [17]. Therefore, against the "dual carbon" background, the journal strengthened promotion of cover articles and hot articles through its WeChat service account. Beyond abstracts, innovation points, and figures/tables, promotional content includes introductions to authors and team members, affiliations, and past research achievements, providing readers with more comprehensive understanding of research backgrounds. Second, since 2020, *Coal Conversion* has implemented online-first publication for all accepted manuscripts as "finalized articles" and promptly promoted these through its WeChat service account. This not only allows users to access content in advance but also advances the dissemination timeline to expand article influence. Currently, the number of *Coal Conversion* WeChat service account users has increased nearly 2.5-fold from 276 in October 2020 to 957 in January 2024, attracting more researchers in the coal chemical engineering field.

2. Development Trends of *Coal Conversion* in Serving the "Dual Carbon" Goals

Through the above pathways, the academic quality and influence of *Coal Conversion* have steadily improved, with the journal being indexed in the Scopus database, included in the World Journal Clout Index (WJCI) Report, and experiencing an approximately 70% increase in impact factor. However, these practical pathways are insufficient for serving the "dual carbon" goals, requir-

ing further exploration of high-quality development by drawing on excellent publishing experiences.

2.1 Expanding Planning Methods for Special Issues, Columns, and Topics

Special issues, columns, and topics offer advantages including strong academic relevance, high information concentration, and convenient reader access. Planning special issues/columns/topics on different "dual carbon" themes not only helps readers obtain information in batches and efficiently but also promotes enhanced precision service and expanded influence. These can be categorized into virtual and regular special issues/columns/topics. On one hand, previously published "dual carbon"-related papers can be sorted and classified by keywords, high-citation/high-output institutions, new technologies/equipment, or theoretical vs. industrial applications to integrate relevant articles and publish different themed virtual special issues/columns/topics. On the other hand, in planning regular special issues/columns/topics, beyond relying on editorial board and society resources, more measures should be implemented. For instance, *Coal Conversion* has established a Young Academic Committee and can form different groups based on members' disciplinary directions and geographical distribution while improving contribution solicitation and evaluation systems to mobilize their planning enthusiasm. The journal can strengthen cooperation with first-class universities and disciplines, 深入 (delving into) key laboratories and research groups, or organize "dual carbon" academic conferences leveraging the influence of top schools and disciplines to invite discipline leaders and key project leaders as special editors or column editors while promoting the journal, thereby deeply 挖掘 (mining) academic resources to plan high-level special issues. Additionally, the journal can plan 精品 (premium) columns on technological innovation based on actual enterprise production conditions.

2.2 Enhancing Precision Service Levels for Users

Exploring sustainable precision push service models that accurately match existing user needs based on big data thinking, digital journal platforms, and various data resources represents the future path for academic journal promotion [18]. The proposal of the "dual carbon" goals has expanded topic scope, leading *Coal Conversion* to expand its editorial board and reviewer pool, select young academic committee members, and strengthen manuscript solicitation through special issue/column/topic planning, conference cooperation, and inviting experts as editors-in-chief. These efforts have diversified the associated academic community of authors and readers. In this context, *Coal Conversion* has implemented precision pushing to ensure academic community members receive academic information matching their research directions. The journal has cooperated with Chongqing Feixiao Data and the AMiner platform but needs to continuously optimize its precision pushing methods to achieve personalized delivery. Before pushing, users should be segmented based on identity infor-

mation to distinguish users by disciplinary direction, editorial board/reviewer status, enterprise affiliation, etc., matching journal tables of contents, selected high-quality articles, and column/topic content with users. Personalized email subjects and content should be tailored for different users to attract reading and citation. For example, editorial board and young academic committee members can receive regular pushes of journal contents, key planned articles or columns, and information on manuscript acceptance status and publication dynamics to facilitate their participation in journal operations. For enterprise users in petrochemical, coal-to-liquid, and steel enterprises, relevant technological innovation achievements can be pushed based on production processes and equipment. Additionally, push frequency and format should be considered to ensure timeliness, aesthetics, and appropriate formatting.

2.3 Exploring Video Account Operations

Short videos integrate dynamic visuals and audio, featuring characteristics of diversification, immediacy, intuitiveness, mobility, and sociality [19], complementing traditional and new media such as "two micros and one web" (Weibo, WeChat, and website) that primarily use text and images. For coal sector scientific journals, searching WeChat video accounts using journal names according to the "2022 High-Quality Scientific Journals in the Coal Sector Grading Directory" reveals that only five journals—*Clean Coal Technology*, *Journal of China Coal Society*, *Coal Geology & Exploration*, *Industry and Mine Automation*, and *Coal Science and Technology*—operate WeChat video accounts, while most coal sector journals have not yet opened video accounts, likely due to insufficient funding and shortage of new media editorial talent. Under the "dual carbon" goals, *Coal Conversion* should actively seek breakthrough paths, broaden funding sources, strengthen editorial team building, draw on advanced experiences in video account operations, and appropriately publish series of short videos on "dual carbon" themes based on its own characteristics and positioning while meeting user needs and focusing on national strategy. On one hand, from the perspective of journal articles, short videos can be planned around innovation points of hot articles, special experimental instruments, main research achievements, and patented technologies to create animated short videos, PowerPoint short videos, or small experiment short videos. Alternatively, interview short videos can be produced by interviewing authors on research backgrounds, ideas, hot issues, and difficult problems. On the other hand, expert interviews can be recorded, producing series reports on experts' explanations of basic concepts, technical processes, research status, and future prospects to deepen user understanding of "dual carbon" issues. Short videos can also be created from highlights of academic salons and summit forums, and video tutorials on academic writing can be recorded to help authors improve their writing skills.

Taking the core journal *Coal Conversion* as the research object, this paper discussed its initiatives serving the "dual carbon" goals from four aspects: expanding topic scope, planning hot special issues, emphasizing achievement transfor-

mation, and improving WeChat promotion. Further development suggestions were proposed from the perspectives of diversifying special issue/column/topic planning methods, enhancing precision service levels for users, and exploring video account operations, aiming to provide references for improving service quality of scientific journals in the coal sector. Although *Coal Conversion* has achieved steady improvements in academic quality and influence in recent years, its capacity to contribute to the "dual carbon" goals through knowledge services remains insufficient, with certain gaps compared to excellence-level journals. Future efforts should focus on strengthening connections with the "dual carbon" academic community, leveraging the disciplinary expertise of editorial board and young academic teams to solicit contributions around key national projects; 深入 (delving into) enterprises to closely track practical production problems and emphasize achievement transformation in the coal sector; and soliciting review articles on important areas or scientific and engineering problems in coal conversion processes to enhance service quality.

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Note: Figure translations are in progress. See original paper for figures.