Waste

1-Conversion of photovoltaic waste silicon into amorphous silicon nanowire anodes

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(provided by Clarivate) Source ENERGY & ENVIRONMENTAL SCIENCE Volume 18 Issue 9 Page 4348-4361 DOI 10.1039/d5ee00020c Published MAY 6 2025 Early Access APR 2025 Indexed 2025-04-11 Document Type Article

Abstract

The rapid growth of the crystalline silicon (Si) photovoltaic industry has led to a steady increase in the production of waste silicon (wSi) generated during the cutting of Si ingots. Nevertheless, intrinsic oxidation and trace impurities in wSi make it difficult to retain or enhance its value for further use. Herein, we proposed a value-added recycling strategy to flash convert wSi into high performance amorphous Si nanowires (a-SiNWs). This method fully leverages the intrinsic oxidation properties of wSi and utilizes a high temperature gradient thermal field generated by carbon thermal shock to drive the directional diffusion of Si atoms within an oxide-limited domain environment. Copper nanoparticles are introduced to modulate the surface energy of Si atoms, inducing the formation of a-SiNWs. The a-SiNWs grow in situ on a carbon substrate, forming a self-supporting electrode material (identified as a-SiNWs@CC). The prepared a-SiNWs@CC is directly used as the anode of lithium-ion batteries, demonstrating excellent initial coulombic efficiency (ICE, 91.35%) and lithium storage capacity (up to 2150 mA h g-1 at 2 A g-1 for more than 250 cycles). The results hold great promise for the high-value utilization of wSi and the development of Si anodes.

Keywords

Keywords Plus

REDUCTION

2-Agro-waste for renewable and sustainable green production: A review

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By Phiri, R (Phiri, Resego) [1] ; Rangappa, SM (Rangappa, Sanjay Mavinkere) [1] ; Siengchin, S (Siengchin, Suchart) [1] (provided by Clarivate) **Source JOURNAL OF CLEANER PRODUCTION Volume 434 DOI 10.1016/j.jclepro.2023.139989 Article Number 139989 Published JAN 1 2024 Early Access DEC 2023 Indexed 2024-01-14 Document Type Review**

Abstract

Agriculture has a historical significance in human society and its present-day role as a vital sector of the global economy is irrefutable. However, the increase in agricultural production prompted by the rising demands has resulted in negative environmental consequences associated waste generation. Agricultural waste (agro-waste) constitutes a significant portion of the waste generated worldwide, causing environmental contamination and posing health risks when not managed properly. It is therefore crucial to formulate pioneering approaches that effectively mitigate the adverse impacts of agricultural waste, necessitating a deeper understanding of agrowaste. This review provides an overview of agro-waste, offering insights into its generation, categorization, composition and associated environmental implications. The sustainable utilization of the agro-waste is explored addressing pressing waste management and resource optimization issues. The paper engages in a comprehensive discussion regarding how agricultural practices contribute to soil degradation, air and water pollution, emphasising their interconnection and the need for integrated solutions. Promising pathways for utilizing agricultural waste, encompassing composting, production of animal feed, bioenergy generation, fiber extractions and biochar production are explored. Additionally, the review examines the complexities of efficiently managing and utilizing agricultural waste, addressing challenges such as the diverse nature of waste sources, compositional variations, contaminants, and practical feasibility considerations. It also explores potential solutions, including the need for further research, infrastructure development, and the establishment of regulatory frameworks and policies to improve agricultural waste management.

Keywords
Author Keywords
AgricultureWaste managementSustainabilityEnvironmental impacts

Keywords Plus
AGRICULTURAL WASTEPROCESS OPTIMIZATIONBY-PRODUCTSMANAGEMENTOPPORTUNITIESVALORISATIONDEGRADATIONCHALLENGESVEGETABLESRESIDUES

Waste

3-Agricultural Waste-Derived Biopolymers for Sustainable Food Packaging: Challenges and Future Prospects

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By Selvam, T (Selvam, Thivya) [1] ; Rahman, NMMA (Rahman, Nor Mas Mira Abd) [1] ; Olivito, F (Olivito, Fabrizio) [2] ; Ilham, Z (Ilham, Zul) [3] ; Ahmad, R (Ahmad, Rahayu) [4] ; Wan-Mohtar, WAI (Wan-Mohtar, Wan Abd Al Qadr Imad) [5] **(provided by Clarivate) Source POLYMERS Volume 17 Issue 14 DOI 10.3390/polym17141897 Article Number 1897 Published JUL 9 2025 Indexed 2025-08-07 Document Type Review Open Peer Reviews**

Abstract

The widespread use of conventional plastic in food packaging has raised serious environmental issues due to its persistence and poor biodegradability. With growing concerns over plastic pollution and its long-term ecological impact, researchers are increasingly turning to natural, renewable sources for sustainable alternatives. Agricultural waste, often discarded in large quantities, offers a valuable resource for producing biodegradable polymers. This review discusses the environmental burden caused by traditional plastics and explores how agricultural residues such as rice husks, corn cobs, and fruit peels can be converted into eco-friendly packaging materials. Various types of biopolymers sourced from agricultural waste, including cellulose, starch, plant and animal-based proteins, polyhydroxyalkanoates (PHA), and polylactic acid (PLA), are examined for their properties, benefits, and limitations in food packaging applications. Each material presents unique characteristics in terms of biodegradability, mechanical strength, and barrier performance. While significant progress has been made, several challenges remain, including cost-effective production, material performance, and compliance with food safety regulations. Looking ahead, innovations in material processing, waste management integration, and biopolymer formulation could pave the way for widespread adoption. This review aims to provide a comprehensive overview of current developments and future directions in the use of agricultural waste for sustainable packaging solutions, comparing their biodegradability and performance to conventional plastics.

Keywords
Author Keywords
biopolymeragricultural wastefood packagingsustainabilitycircular economy

Keywords Plus
CELLULOSE NANOCRYSTALSBARRIER PROPERTIESCROSS-LINKINGFILMSPLASTICSPOLYSACCHARIDEESTERIFICATIONFABRICATIONEXTRACTIONNANOFIBERS

Waste

4-Pathways to reduce global plastic waste mismanagement and greenhouse gas emissions by 2050

By Pottinger, AS (Pottinger, A. Samuel) [1] , [2] ; Geyer, R (Geyer, Roland) [3] ; Biyani, N (Biyani, Nivedita) [3] , [4] ; Martinez, CC (Martinez, Ciera C.) [1] , [2] ; Nathan, N (Nathan, Neil) [4] ; Morse, MR (Morse, Molly R.) [4] ; Liu, C (Liu, Chao) [5] ; Hu, SY (Hu, Shanying) [5] ; de Bruyn, M (de Bruyn, Magali) [1] , [2] ; Boettiger, C (Boettiger, Carl) [1] , [2] ; **(provided by Clarivate) Source SCIENCE Volume 386 Issue 6726 Page 1168-1173 DOI 10.1126/science.adr3837 Published DEC 6 2024 Indexed 2025-03-08 Document Type Article**

Abstract

Plastic production and plastic pollution have a negative effect on our environment, environmental justice, and climate change. Using detailed global and regional plastics datasets coupled with socioeconomic data, we employ machine learning to predict that, without intervention, annual mismanaged plastic waste will nearly double to 121 million metric tonnes (Mt) [100 to 139 Mt 95% confidence interval] by 2050. Annual greenhouse gas emissions from the plastic system are projected to grow by 37% to 3.35 billion tonnes CO2 equivalent (3.09 to 3.54) over the same period. The United Nations plastic pollution treaty presents an opportunity to reshape these outcomes. We simulate eight candidate treaty policies and find that just four could together reduce mismanaged plastic waste by 91% (86 to 98%) and gross plastic-related greenhouse gas emissions by one-third.

Keywords

Keywords Plus

TREATYADDRESSLESSONSTAX

Waste

5-Creep characterisation and microstructural analysis of municipal solid waste incineration fly ash geopolymer backfill

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By Su, LJ (Su, Lijuan) [1] ; Wu, SY (Wu, Siyao) [1] ; Fu, GS (Fu, Guosheng) [1] ; Zhu, WC (Zhu, Wancheng) [2] ; Zhang, XD (Zhang, Xiangdong) [1] ; Liang, B (Liang, Bing) [3] **Source SCIENTIFIC REPORTS Volume 14 Issue 1 DOI 10.1038/s41598-024-81426-7 Article Number 29828 Published NOV 30 2024 Indexed 2024-12-13 Document Type Article**

Abstract

In this work, an alkali-activated municipal solid waste incineration (MSWI) fly ash-based filling material was prepared with MSWI fly ash as the raw material and slag as the auxiliary material. The filling body experiences long-term creep, which may have a direct effect on the stability of the overlying strata of the mine goaf. The long-term mechanical properties of the fly ash-based filling materials were tested with a triaxial rheological apparatus. First, uniaxial creep testing was carried out at five levels of axial stress: 50%, 60%, 70%, 80% and 90% of the uniaxial compressive strength (UCS). Then, triaxial creep testing was carried out by considering the geological environment of the goaf. The creep characteristics of fly ash-based filling materials under a three-dimensional stress state were explored. The results indicate that (1) under different stress levels, the creep curves of fly ash-based filling materials can be divided into three types: decelerated creep-stable creep, decelerated creep-constant creep, and decelerated creep-constant creep-accelerated creep. (2) The total creep deformation of the fly ash-based filling material is 0.46 similar to 0.78%, which is similar to the creep deformation of soft rock. The instantaneous deformation during loading contributes most of the total deformation. (3) The polymerization products generated in the fly ash-based filling material system can effectively cement the raw material particles, and the presence of gel can effectively delay the accelerating creep process of the material. (4) A nonlinear fractional-order model composed of an Abel dashpot can fully describe the complete process of decelerating creep-constant creep-accelerating creep.

Keywords

Author Keywords

Municipal solid waste incineration (MSWI) fly ashFilling materialCreepFractional order modelPore structure

Waste

6-Environmental and socio-economic effects of construction and demolition waste recycling in the European Union

By Caro, D (Caro, D.) [1] ; Lodato, C (Lodato, C.) [2] ; Damgaard, A (Damgaard, A.) [2] ; Cristóbal, J (Cristobal, J.) [3] ; Foster, G (Foster, G.) [1] ; Flachenecker, F (Flachenecker, F.) [4] , [5] ; Tonini, D (Tonini, D.) [1] (provided by Clarivate) **Source SCIENCE OF THE TOTAL ENVIRONMENT Volume 908 DOI 10.1016/j.scitotenv.2023.168295 Article Number 168295 Published JAN 15 2024 Early Access NOV 2023 Indexed 2023-12-16 Document Type Article**

Abstract

The recovery rate of construction and demolition waste (CDW) in the European Union (EU) is at 89 % and thus high relative to other waste streams. However, the relatively high figure can be misleading because it typically does not correspond to high-value material recovery but rather "poor" levels of circularity. From a life-cycle perspective, we assess the environmental impacts and costs of 12 CDW material fractions relying on alterna-tive pathways and treatment technologies. The results indicate important trade-offs in the transition towards the circular economy. Indeed, recycling of concrete, bricks, gypsum, and ceramics and tiles represent the best environmental performance but also the most expensive pathway. However, when shifting from landfill to recycling the total societal costs in the EU are reduced mainly due to the lower external costs. Overall, recycling CDW in the EU with advanced technologies would save about 264 kg CO2-eq t(-1) with a cost of 25 EUR t(-1). The maximum potential for recycling under current technology in the EU would lead to an annual total reduction of about 33 Mt. of CO2-eq using 2020 as reference year. The fractions with the highest potential for improving current waste management practices in terms of environmental improvements are concrete and bricks. The economic and non-economic barriers for realising this potential at EU level are discussed in relation to the European Green Deal and the EU's circular economy objectives.

Keywords

Author Keywords

Infrastructure wasteCircular economyRecyclingEnvironmental assessmentSocio-economic assessmentSecondary materials

Keywords Plus

LIFE-CYCLE ASSESSMENTMANAGEMENTAGGREGATECONCRETECEMENTLCA

7-Revealing the closed pore formation of waste wood-derived hard carbon for advanced sodium-ion battery

By Tang, Z (Tang, Zheng) [1] ; Zhang, R (Zhang, Rui) [1] ; Wang, HY (Wang, Haiyan) [1] ; Zhou, SY (Zhou, Siyu) [1] , [2] ; Pan, ZY (Pan, Zhiyi) [3] ; Huang, YC (Huang, Yuancheng) [1] ; Sun, D (Sun, Dan) [1] ; Tang, YG (Tang, Yougen) [1] ; Ji, XB (Ji, Xiaobo) [1] ; Amine, K (Amine, Khalil) [4] ; **(provided by Clarivate) Source NATURE COMMUNICATIONS Volume 14 Issue 1 DOI 10.1038/s41467-023-39637-5 Article Number 6024 Published SEP 27 2023 Indexed 2023-11-27 Document Type Article**

Abstract

Although the closed pore structure plays a key role in contributing low-voltage plateau capacity of hard carbon anode for sodium-ion batteries, the formation mechanism of closed pores is still under debate. Here, we employ waste wood-derived hard carbon as a template to systematically establish the formation mechanisms of closed pores and their effect on sodium storage performance. We find that the high crystallinity cellulose in nature wood decomposes to long-range carbon layers as the wall of closed pore, and the amorphous component can hinder the graphitization of carbon layer and induce the crispation of long-range carbon layers. The optimized sample demonstrates a high reversible capacity of 430 mAh g-1 at 20 mA g-1 (plateau capacity of 293 mAh g-1 for the second cycle), as well as good rate and stable cycling performances (85.4% after 400 cycles at 500 mA g-1). Deep insights into the closed pore formation will greatly forward the rational design of hard carbon anode with high capacity.

It is essential to investigate the formation mechanism of closed pore, which contributes to low-voltage plateau capacity of hard carbon anode in sodium ion batteries. Herein, the authors explore the impact of wood precursor components and carbonization temperature on closed pore formation in hard carbon for enhanced battery performance.

Keywords

Keywords Plus

HIGH-PERFORMANCE SODIUMSTORAGEANODESMECHANISMSPECTRASTATENMRNA

Waste

8-Efficient and high-selective lithium extraction from waste LiMn2O4 batteries by synergetic pyrolysis with polyvinyl chloride

By Zhang, YX (Zhang, Yuxue) [1] ; Liu, ZY (Liu, Zhaoyong) [2] ; Wang, JH (Wang, Jiahui) [3] ; Du, H (Du, Hui) [1] ; Sun, Q (Sun, Qi) [1] ; Gao, RT (Gao, Ruitong) [1] ; Xu, ZM (Xu, Zhenming) [4] Source WASTE MANAGEMENT Volume 198 Page 95-105 DOI 10.1016/j.wasman.2025.02.049 Published MAY 1 2025 Early Access MAR 2025 Indexed 2025-03-13 Document Type Article

Abstract

Recycling Li from spent lithium ion batteries (SLIBs) in an efficient and highly selective manner could protect the environment and introduce the circular economy principle to society. Simultaneously, the urgent need to address plastic waste, particularly polyvinyl chloride (PVC), has become a global concern. In this work, a strategy for Li extraction through synergetic pyrolysis of LiMn2O4 cathode materials (LMO) and PVC is proposed. Under optimal conditions, the recovery rates of lithium and manganese reached 99.89 % and 0.02 %, respectively, demonstrating efficient separation of these elements. Temperature was found to play a critical role in the leaching rates of lithium and manganese by promoting the decomposition and reduction of LMO. Additionally, kinetic analysis shows that the activation energy (Ea) of the synergetic pyrolysis is 139.60 KJ/mol, and the pyrolysis mechanism satisfies third-order reaction process. Eventually, the proposed mechanism involves the synergistic effects of chlorination and reduction reactions. First, HCl is generated by PVC pyrolysis under the catalytic effect of LMO. Then, the chlorination of HCl with LMO occurs by capturing structural oxygen and generating LiCl and MnCl2. Simultaneously, the reduction reaction between the reducing species generated by PVC pyrolysis and LMO occurs to form Li2O and MnO, ultimately enabling the separation of lithium and manganese. Overall, this paper presents a novel approach for future applications by providing a theoretical basis for selective Li extraction.

Keywords
Author Keywords
SLIBs recyclingPolyvinyl chlorideLiMn 2 O 4 cathode materialSynergetic pyrolysisChlorination reactionReduction reaction

Keywords Plus
ION BATTERIESVALUABLE METALSTHERMAL-DEGRADATIONCATHODE MATERIALSRECOVERYACIDEVOLUTIONKINETICSPVC

Waste

9-Effect of polymeric aluminum chloride waste residue and citric acid on the properties of magnesium oxychloride cement

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By Xu, P (Xu, Ping) [1] ; Guo, YK (Guo, Yuekang) [1] ; Ding, YH (Ding, Yahong) [1] ; Li, H (Li, Han) [1] ; Chen, TY (Chen, Tianyu) [1] ; Wang, HK (Wang, Haokun) [1] (provided by Clarivate) **Source JOURNAL OF BUILDING ENGINEERING Volume 101 DOI 10.1016/j.jobe.2025.111864 Article Number 111864 Published MAY 1 2025 Early Access JAN 2025 Indexed 2025-02-10 Document Type Article**

Abstract

Polymeric aluminum chloride(PAC) is a solid waste produced during the production of PAC. It is a weakly acidic residue containing chloride ions, compatible with magnesium oxychloride cement (MOC). If PAC waste residue can be incorporated into MOC so that its performance can be improved, PAC waste residue will be utilized at a high value. This paper studied the effects of citric acid (CA) and PAC waste on the working properties, water resistance, mechanical properties, physical properties, and volume stability of MOC. The modification mechanism was analyzed by X-ray diffraction, scanning electron microscopy, and energy-dispersive X-ray spectroscopy. The results showed that incorporating CA and PAC waste residue delayed the setting time of MOC and reduced the fluidity of the slurry. MOC with 0.4 % CA and 10 % PAC waste residue has the best comprehensive performance, water resistance, volume stability, and pore structure have been effectively improved, and the compressive strength of 28 d is still 50 MPa. XRD and SEM showed that incorporating CA and PAC waste residue affected the development of the 5-phase (5 Mg (OH)2 center dot MgCl2 center dot 8H2O) and changed the crystal morphology of the 5-phase. The MOC with PAC waste residue generated an amorphous gel, which wrapped the surface of the 5phase and prevented its hydrolysis.

Keywords

Author Keywords

PAC waste residueMagnesium oxychloride cementMechanical propertiesWater resistancePhysical propertiesVolume stabilityModification mechanism

Keywords Plus

PULVERIZED FUEL ASHWATER RESISTANCEPHOSPHORIC-ACIDMECHANICAL-PROPERTIESPERFORMANCESTABILITY

Waste

10-Waste glass powder as a high temperature stabilizer in blended oil well cement pastes: Hydration, microstructure and mechanical properties

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By Dai, T (Dai, Tian) [1] ; Fang, CL (Fang, Changliang) [1] ; Liu, TL (Liu, Tianle) [1] ; Zheng, SJ (Zheng, Shaojun) [1] ; Lei, G (Lei, Gang) [1] ; Jiang, GS (Jiang, Guosheng) [1] (provided by Clarivate) **Source CONSTRUCTION AND BUILDING MATERIALS Volume 439 DOI 10.1016/j.conbuildmat.2024.137359 Article Number 137359 Published AUG 16 2024 Early Access JUL 2024 Indexed 2024-07-18 Document Type Article**

Abstract

Recycling waste glass for diversified utilization has received increasing attention in recent years. This work aimed to reuse waste glass powder (GP) as a high temperature stabilizer to replace silica flour (SF) in blended G class oil well cement (GOWC) pastes. Blended pastes containing 40 % and 66.7 % GP were prepared and compared to pure GOWC paste and blended paste containing 40 % SF commonly used in the oil industry. Under simulated field conditions in a steam injection well, these pastes were cured at 50 degrees C for seven days, followed by three rounds of thermal cycling curing at high temperature and high pressure (HTHP, 300 degrees C/13 MPa) conditions. The effects of GP on the hydration kinetics, hydration products, microstructure, and mechanical properties of hardened pastes were evaluated. The results demonstrated that the addition of GP or SF reduced the compressive strength of the pastes at 50 degrees C due to dilution effect. Compared with SF, GP exhibited higher pozzolanic activity, prolonged the induction period, and promoted the formation of more C-(N)-S-H gels with lower Ca/Si ratios, which led to an increase in the gel pores content of the matrix and partially compensated for the loss of compressive strength due to the dilution effect. Additionally, due to the pozzolanic reaction of GP, the content of CH in the matrix decreased and its crystal size became smaller. After three rounds of thermal cycling curing, the incorporation of GP significantly increased the compressive strength of the hardened pastes. The compressive strengths of the hardened pastes with 40 % and 66.7 % GP were 20.33 MPa and 22.25 MPa, respectively, which were 7.62 % and 17.79 % higher than those of the hardened paste containing 40 % SF. In addition, the compressive strengths of hardened pastes containing 40 % and 66.7 % GP after three rounds of thermal cycling curing decreased by 22.49 % and 5.52 %, respectively, compared to the pastes at the lowtemperature stage, while that of the pure GOWC pastes decreased by 83.8 %. Characterization analyses indicated that GP could further reduce the Ca/Si ratio of the system, modulate the crystallization of the gels at high temperatures, and generate foshagite or xonotlite phases with high polymerization structure and thermal stability, instead of reinhardbraunsite. These products effectively refined pore structure and enhanced microstructure densification. Furthermore, the precipitation of Na+ ions during hydration did not affect the microstructure of the matrix. This study offers some guidelines for recycling waste glass, conserving raw materials, and producing sustainable blended cement pastes.

Keywords
Author Keywords

Waste

Waste glass powderOil well cementMicrostructureMechanical propertiesHigh temperature and high pressure

Keywords Plus

MINERAL WOOL WASTECALCIUMCONCRETEASHPERFORMANCENANOSILICABEHAVIORFINE

Waste

11-Agricultural wastes: A practical and potential source for the isolation and preparation of cellulose and application in agriculture and different industries

By Riseh, RS (Riseh, Roohallah Saberi) [1] ; Vazvani, MG (Vazvani, Mozhgan holizadeh) [1] ; Hassanisaadi, M (Hassanisaadi, Mohadeseh) [1] ; Thakur, VK (Thakur, Vijay Kumar) [2] , [3] , [4] (provided by larivate) **Source INDUSTRIAL CROPS AND PRODUCTS Volume 208 DOI 10.1016/j.indcrop.2023.117904 Article Number 117904 Published FEB 2024 Early Access DEC 2023 Indexed** 2024-02-02 **Document Type** Article

Abstract

Cellulose is an organic compound belonging to polysaccharides. This biopolymer is made of glucose subunits. This compound plays an essential role in the structure and strength of plants. This polymer has biodegradable, biocompatible, and renewable properties. Agricultural wastes are excellent sources for cellulose extraction. Agricultural wastes are lignocellulosic materials, and cellulose and lignin are the main components of these wastes. Millions of tons of agricultural waste are thrown away and burned yearly. This large amount of waste leads to environmental pollution and waste of renewable energy resources. Upgrading such waste by developing innovative products such as cellulose nanomaterials and nanocomposites can have high environmental and economic benefits. The intelligent use of agricultural waste as a rich source of cellulose can be primarily responsible for the increase in population and industrialization of countries. Optimal cellulose extraction from agricultural waste can be widely used in various fields of agriculture, industry, medicine, and energy. Different chemical, physical, physicochemical, and biological methods have been presented to extract cellulose and its derivatives from agricultural waste. In this review, we will discuss the position and importance of cellulose, the importance of agricultural waste in the extraction of cellulose, and the use of extracted cellulose from agrarian wastes in various sources.

Keywords
Author Keywords
CelluloseBiodegradableBiocompatibleLignocellulosic MaterialsAgricultural WasteOptimal ExtractionPolymer

Keywords Plus
DEEP EUTECTIC SOLVENTSVINEYARD PRUNING WASTEWHEAT-STRAWMICROCRYSTALLINE CELLULOSELIGNOCELLULOSIC BIOMASSMECHANICAL-PROPERTIESENZYMATIC-HYDROLYSISMETHANE PRODUCTIONRICE STRAWPSEUDOMONAS-FLUORESCENS

Waste

12-Can the energy conservation and emission reduction demonstration city policy enhance urban domestic waste control? Evidence from 283 cities in China

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By Ma, QS (Ma, Qingshan) [1] ; Zhang, YM (Zhang, Yuanmeng) [2] ; Hu, F (Hu, Feng) [3] ; Zhou, HY (Zhou, Haiyan) [4] (provided by Clarivate) **Source CITIES Volume 154 DOI 10.1016/j.cities.2024.105323 Article Number 105323 Published NOV 2024 Early Access AUG 2024 Indexed 2024-08-16 Document Type Article**

Abstract

The impact of energy conservation and emission reduction (ECER) policies on domestic waste control has not been determined. Previous papers have focused predominantly on industrial pollution rather than domestic waste control. To fill this gap, this paper evaluates the impact of the ECER demonstration city policy on domestic waste control based on Chinese city-level data from 2010 to 2020 using a staggered difference-in-differences model. This paper finds that the implementation of the policy has significantly increased the amount of urban domestic waste removed and the capacity for harmless disposal. A comprehensive examination of possible mechanisms reveals that ECER demonstration cities have achieved improved domestic waste control through channels such as increased government inputs in waste control, the promotion of green lifestyles among residents, and the promotion of technological advances in waste control. Detailed heterogeneity analyses reveal that the positive impact of the policy on domestic waste control is greater in cities at a high level in the administrative hierarchy, in eastern cities, and in large cities. This study has strong practical significance, as it provides insights supporting differentiated efforts to promote the construction of ECER demonstration cities and guidance for improving domestic waste control capacity by exploiting ECER policies.

Keywords
Author Keywords
ECER policiesDomestic waste controlWaste management investmentGreen lifestyleStaggered DID

Keywords Plus
ENVIRONMENTAL-PROTECTIONINVESTMENTINCENTIVESMANAGEMENTEFFICIENCY