

The Challenge in Managing Healthcare Waste in the Treatment of Diabetes Mellitus in Brazil

Luis Fernando Costa Pereira¹, Perla Calil Pongeluppe Wadhy Rebehy²,
Márcio Flávio Moura de Araújo³, Flávia Cândido Ribeiro dos Santos¹,
Lucia Aparecida Parra¹, Ana Carolina Corsino Franco¹, João Batista Moreira⁴,
Pedro Miguel dos Santos Diniz Parreira⁴, Carla Regina de Souza Teixeira¹

¹Department of Graduate Studies in Fundamental Nursing, Ribeirão Preto School of Nursing, University of São Paulo, Ribeirão Preto, Brazil

²Faculty of Economics, Administration and Accounting of Ribeirão Preto, University of São Paulo, University of São Paulo, Ribeirão Preto, Brazil

³Foundation Oswaldo Cruz, Ceará, Brazil

⁴Coimbra Higher Nursing School, Coimbra, Portugal

Email: luisfernandocosta@usp.br

How to cite this paper: Pereira, L. F. C., Rebehy, P. C. P. W., Araújo, M. F. M., Santos, F. C. R., Parra, L. A., Franco, A. C. C., Moreira, J. B., Parreira, P. M. S. D., & Teixeira, C. R. S. (2024). The Challenge in Managing Healthcare Waste in the Treatment of Diabetes Mellitus in Brazil. *Journal of Human Resource and Sustainability Studies*, 12, 101-109.

<https://doi.org/10.4236/jhrss.2024.121007>

Received: December 23, 2023

Accepted: March 19, 2024

Published: March 22, 2024

Copyright © 2024 by author(s) and Scientific Research Publishing Inc. This work is licensed under the Creative Commons Attribution International License (CC BY 4.0).

<http://creativecommons.org/licenses/by/4.0/>



Open Access

Abstract

The advancement of technologies and supplies related to Diabetes Mellitus management has led to a growing production of waste with negative environmental consequences, prompting a call for sustainability in public policies. However, one of the challenges is the management of waste generated by these devices, favoring environmental preservation and the increased use of materials that can be recycled. This paper provides a reflective analysis of current public policy guidelines in Brazil regarding the disposal of healthcare waste. It concludes that a new perspective is needed concerning Brazilian health public policies, coupled with strategies enabling the reprocessing of healthcare waste through a circular economy model. Such an approach would foster innovations in healthcare, aiming for environmental preservation through ecologically sustainable actions to reduce the volume of waste, especially plastics, associated with Diabetes *Mellitus* treatment in the home context.

Keywords

Diabetes Mellitus, Health Policy, Waste Management, Health Strategies, Syringes

1. Introduction

The increasing advancement of technologies and inputs associated with the

management of Diabetes Mellitus (DM) has been accompanied by the generation of plastic waste that has adverse environmental implications, thus requiring the recognition of the importance of environmental sustainability (Klonoff et al., 2020).

The use of disposable and single-use devices, coupled with other mobile technologies, has facilitated the lives of people with DM as they offer convenience and assist in the organization and handling of supplies (Klonoff et al., 2020). Items such as needles, syringes, lancets, insulin vials, and even by-products of medications are included in this logistics (Klonoff et al., 2020; Huang et al., 2022).

Of particular interest are insulin pens, introduced in 1980 to improve the treatment of DM (Huang et al., 2022; Jefferson, Marteu, Smith, & Baum, 1985). Currently, there are two types of insulin pens: reusable and disposable. Disposable pens are the most widely used and provided by the Unified Health System (UHS) in Brazil (Health Pen, 2023), demonstrating effectiveness in clinical response, greater convenience, dose accuracy, and safety in medication administration (Health Pen, 2023; Maia & Araújo, 2002).

However, one of the challenges lies in managing the waste generated by these devices, as well as in the production and adaptation of these and other new technologies to promote environmental preservation and the reuse of recyclable materials.

Despite current guidelines, the improper disposal of these waste materials due to a lack of knowledge remains a longstanding global challenge (Bouhanick, Hadjadj, & Weekers, 2000) and continues to persist (Huang et al., 2022). A recent cross-sectional study conducted in Egypt with 450 patients aimed to assess the knowledge and practices of individuals with DM regarding the safe disposal of insulin injection devices. The study revealed that the majority of respondents do not appropriately dispose of sharps containers at home. One of the reported issues was the unavailability of suitable devices for sharps disposal. The study suggested the need for a national program to contribute to environmental improvement in the face of waste generated from DM treatment (Hassan et al., 2021).

A study conducted in Brazil indicates that the lack of guidance on the disposal of healthcare waste for individuals with DM receiving insulin therapy leads to the disposal of sharps containers in regular household waste. This practice poses greater risks to public health and the environment. The study concludes that such practices require guidance and interventions to protect the environment and waste collection workers (Santos & Ruiz, 2020).

The practice of disposing of syringes and needles at home nearly tripled between 2001 and 2011, resulting in increased risks of exposure for waste separation workers (Environmental Research & Education Foundation, 2018). In this context, the gradual increase in the production of these waste materials makes it essential to adapt public health policies (Estequi et al., 2018).

In this context, strategies for reprocessing insulin pens through the circular

economy model that can introduce innovative solutions in the healthcare sector, aiming to mitigate environmental risks through sustainable actions, are crucial to reducing Medical Waste (MW) related to DM treatment.

This study aimed at a reflective analysis based on the health policies in force in Brazil related to the management of health waste in the treatment of DM. In line with this objective, we are currently conducting the research project “Sustainable Pen”, which aims to evaluate effective methods to improve the management of MW in the context of primary MW.

Therefore, it is necessary to reflect on the current guidelines and public policies in the national scenario to better understand this situation.

2. Methodology

This is a reflective theoretical study developed based on scientific research, critical analysis of health policies, and established principles within the Unified Health System, referencing current alternative and complementary health practices in Brazil. The theoretical framework of this study aligns with a qualitative approach, aiming to analyze the theoretical elements obtained through the literature review conducted (Minayo, 2006).

The development of this article adhered to the assumptions of a literature review, a process that involves systematizing information on specific issues within a robust body of knowledge. The purpose is to analyze the gathered information and contrast it with the current scenario, ultimately conducting a reflective analysis of the management of health waste generated in the treatment of DM in Brazil.

3. Discussion

3.1. Supply of Inputs for Diabetes Mellitus Treatment in Brazil

In the state of São Paulo, State Law No. 10.782/01 (São Paulo, 2001), and Ordinance 2.583/07 (Ministry of Health, 2007) ensure the supply of free medications and supplies for patients used at home.

Disposable devices, single-use for DM treatment, generate contaminated waste, including needles, lancets, insulin vials, syringes, glucose monitoring strips, insulin pens, disposable pumps, infusion catheters, glucose sensors, as well as batteries, glucose monitors, and packaging of devices that constitute other types of waste (Klonoff et al., 2020; Jefferson, Marteu, Smith, & Baum, 1985; Health Pen, 2023; Santos & Ruiz, 2020). All these residues impact the ecosystem surrounding the health territory of these individuals.

With the growth in the number of people with DM in Brazil, there has also been an increased purchase of insulin vials, pens, and refills, totaling 121 million units from 2015 to 2020 (Catão, Mosegui, Vianna, Cunha, Figueiredo, & López, 2022). This scenario makes waste management a public health issue, as the improper disposal of these materials in household waste exposes the population and waste collectors to the risks of physical and biological accidents, in addition

to environmental harm (Klonoff et al., 2020; Santos & Ruiz, 2020). On the other hand, there is a lack of programs and regulations governing the management of healthcare waste produced at home (Santos & Ruiz, 2020).

Countries like the United States and Australia have public health policies to guide the population using sharps at home or work, suggesting safe options to avoid accidents. However, these options involve acquiring disposal devices independently, scheduling delivery through mail services, or health units (*Best Way to Get Rid of Used Needles and Other Sharps*, 2023).

Brazil lacks public policies regarding the disposal of sharps at home, providing only recommendations for safe practices, based on storing general supplies in wide-mouthed plastic bottles with lids and later sending them to the nearest health service (Brazilian Diabetes Society, 2023).

The Brazilian Ministry of Health recommends that sharp objects be packaged in rigid, watertight, puncture-resistant, and impermeable containers with appropriate labeling. These containers should be replaced when they reach 3/4 of their capacity, and manual emptying and reuse are strictly prohibited (National Health Surveillance Agency, 2018). After sealing, these devices should be sent to the designated location for storage of waste generated by the health unit (Brazilian Diabetes Society, 2023; National Health Surveillance Agency, 2018). Therefore, waste generated at home represents a significant public health problem and poses a major challenge to sustainability, green economy, and achieving the 17 Sustainable Development Goals of the 2030 Agenda (SDGs 2030) (*Sustainable Development and the United Nations' Sustainable Development Goals*, 2023). It is crucial that public administrators from various sectors not only develop but also implement clear and accessible legislation and public policies to address this overlooked waste management issue.

3.2. Reverse Logistics

The reverse logistics, a practice that involves dedication, responsibility, and commitment, is fundamental for economic and socio-environmental support (Pacheco, Novais, & Liberal, 2021). Commercial establishments play a role in the reverse logistics of antidiabetic medications and their packaging (Brazil, 2020).

The National Solid Waste Policy describes the guidelines applicable in the National Solid Waste Plan (NSWP), which should primarily address the current waste situation, including goals for waste reduction, reuse, and recycling (Brazil, 2010).

NSWP is adapted to local contexts, follows legal premises, aims to eliminate waste disposal practices, reduce waste sent for final disposal, promote social inclusion, and provides guidelines and strategies for waste management. It also includes programs and projects to achieve sustainable and conscious development (Ministry of the Environment, 2022).

In this context, home-generated MW still faces discrepancies in terms of its disposal by healthcare service users, which directly leads to improper final dis-

posal, especially in the treatment of DM.

3.3. Diabetes and Healthcare Waste Management

Supplies used for DM treatment at home are transported to healthcare services, where they undergo incineration (Brazilian Diabetes Society, 2023; *Sustainable Development and the United Nations' Sustainable Development Goals*, 2023). The main technical recommendations regarding healthcare waste disposal can be found in Resolution No. 306, December 7, 2004 (National Health Surveillance Agency, 2004); Resolution No. 358, April 29, 2005 (National Council for the Environment, 2005); and Regulatory Norm 32 of 2005 (Ministry of Labor and Employment, 2005).

Despite these guidelines, improper disposal of these wastes remains a challenge (Huang et al., 2022). A significant milestone in DM treatment in 2017 in the UHS is the provision of disposable insulin pens, in addition to short needles (Ministry of Health, 2017).

After the publication of Technical Note No. 169/2022, the age range of DM patients entitled to free access to insulin pens provided by SUS expanded (Ministry of Health, 2022). According to this note, 70% of patients with indications for human insulin had access to pens, and by 2023, it is expected that the medication will be available to 100% of patients (Health Pen, 2023).

From 2019 to 2021, the “Health Pen” campaign provided guidance to encourage the return of insulin pens to healthcare services for proper incineration (Health Pen, 2023). This differs from the recommendation of the Brazilian Diabetes Society, which advises to discard the pen cap and needle cap in regular trash and return only the pen with the medication vial and needles to healthcare services (Brazilian Diabetes Society, 2023).

In Ribeirão Preto, São Paulo, Brazil, according to the protocol of the Program for the Care of People with Non-communicable Chronic Diseases of the Municipal Secretariat, the recommendation is to discard the insulin pen provided by SUS in household waste for later disposal in a sanitary landfill (*Program for the Care of People with Non-Communicable Chronic Diseases. Arterial Hypertension and Diabetes Mellitus*, 2021).

Considering that insulin pen tubes are waste from pharmaceutical products, medicines, and similar substances and do not meet the criteria of carcinogenicity, teratogenicity, reproductive toxicity, genotoxicity, evidence of organic toxicity, or endocrine disruption, as defined in the technical standard established by the Center for Health Surveillance of the Coordination of Disease Control of the São Paulo State Health Department (Health Surveillance Center, 2008). Thus, it is understood that insulin pen tubes are not classified as Hazardous Medicinal Waste and could be discarded with household waste.

It is also established that insulin pen tubes can be considered empty if they meet the following criteria: primary packaging of medicine that does not show visible signs of residue from its original content or that has a residual quantity of medicine less than 3% of the original content of the packaging (Health Surveil-

lance Center, 2008), and are not considered hazardous as in Article 42 (National Health Surveillance Agency, 2018). In addition, Article 61 states that: “Packaging and materials contaminated by chemicals, except empty primary packaging of medicines whose pharmaceutical classes are listed in Article 59 of this Resolution, must be handled in the same way as the chemical product that contaminated them” (National Health Surveillance Agency, 2018).

In this context, the classification of these healthcare wastes may be appropriate for Group D: wastes that do not present a biological, chemical, or radiological risk to health or the environment, and can be equated to household waste, provided that the primary packaging is empty.

This controversy in guiding the disposal of wastes generated at home by people with DM represents a major challenge for public managers in various sectors, in creating and implementing clear and accessible legislation and public policies that contribute to the correct management of these supplies (Klonoff et al., 2020; Huang et al., 2022; Santos & Ruiz, 2020; *Best Way to Get Rid of Used Needles and Other Sharps*, 2023; Pacheco, Novais, & Liberal, 2021; Brazil, 2010; Ministry of the Environment, 2022).

Safe and efficient recommendations for the proper management of wastes generated at home aim to protect people and animals, as well as preserve public health, natural resources, and the environment (National Health Surveillance Agency, 2018).

Studies indicate that approximately 43.5% of global river locations have concentrations where ecotoxicological effects can be expected due to the improper disposal of medications, intensifying the global issue of the pharmaceutical industry and hindering the achievement of SDGs 2030 (*Sustainable Development and the United Nations’ Sustainable Development Goals*, 2023; Bouzas-Monroy, Wilkinson, Melling, & Boxall, 2022).

Due to the deficit in home-generated healthcare waste management programs and the lack of legislation, patients dispose of supplies in inappropriate locations (Santos & Ruiz, 2020). It is evident that with the increased use of insulin pens at home, there is a discrepancy in disposal guidance and an increase in the volume of plastic generated in urban waste, as the absence of efficient plastic waste management is a global and urgent concern that requires assessment (Klonoff et al., 2020; *Sustainable Development and the United Nations’ Sustainable Development Goals*, 2023).

Thus, we are developing the “Sustainable Pen” project aimed at finding scientific evidence to better support patient autonomy in delivering their healthcare waste to health units. Also, to solidify a proposal for efficient, sustainable, and economically viable management through the circular economy, and longer lifespan of plastics derived from insulin pens.

4. Conclusion

The disposal of solid waste, especially plastics, in the treatment of diabetic pa-

tients represents a significant public health problem. This issue may worsen as the number of patients increases, making it crucial to address waste generation in households, as they are sources of solid waste. On the other hand, environmental sustainability and waste management have become global priorities, with policies concentrated in these areas. The solution to this problem may lie in a triple approach: intersectoral collaboration, health education, and public health policies that promote the proper disposal of supplies for DM treatment.

Guidelines from the Ministry of Health and the Brazilian Diabetes Society emphasize the importance of storing these supplies in appropriate containers before sending them to a health facility. However, there are conflicting regulations regarding the classification of insulin products as hazardous waste. While one law does not consider insulins hazardous, another resolution determines their disposal in specific hazardous waste landfills. In this regard, the encouragement of new studies could contribute to a deeper understanding of the issue.

Most supplies for diabetes treatment are made of plastic, contributing to environmental concerns. Therefore, it is necessary to implement new public health policies to mitigate these environmental impacts and improve healthcare waste management in households. This would optimize the safety of patients, their families, and the population involved in waste collection, in addition to generating economic impacts.

Scientific evidence and initiatives focusing on waste management are encouraged to inform the development of effective public policies and should involve professional and public education. This aligns with programs promoting the circular economy and reverse logistics to reduce global environmental impacts, in accordance with the Sustainable Development Goals (SDGs) for 2030.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Best Way to Get Rid of Used Needles and Other Sharps* (2023). FDA. <https://www.fda.gov/medical-devices/safely-using-sharps-needles-and-syringes-home-work-and-travel/best-way-get-rid-used-needles-and-other-sharps>
- Bouhanick, B., Hadjadj, S., & Weekers, L. (2000). What Do the Needles, Syringes, Lancets and Reagent Strips of Diabetic Patients Become in the Absence of a Common Attitude? About 1070 Questionnaires in Diabetic Clinics. *Diabetes and Metabolism*, 24, 288-293. <http://hdl.handle.net/2268/69660>
- Bouzas-Monroy, A., Wilkinson, J. L., Melling, M., & Boxall, A. B. A. (2022). Assessment of the Potential Ecotoxicological Effects of Pharmaceuticals in the World's Rivers. *Environmental Toxicology and Chemistry*, 41, 2008-2020. <https://doi.org/10.1002/etc.5355>
- Brazil (2010). *Law No. 12.305, August 2, 2010. Establishes the National Solid Waste Policy; Amends Law No. 9,605, February 12, 1998; and Provides Other Provisions*. Official Gazette of the Union.

- https://www.planalto.gov.br/ccivil_03/_ato2007-2010/2010/lei/112305.htm
- Brazil (2020). *Decree-Law No. 10.388, June 5, 2020. Regulates Paragraph 1 of Article 33 of Law No. 12.305, August 2, 2010, and Establishes the Reverse Logistics System for Expired or Unused Household Medicines, for Human Use, Industrialized and Compounded, and Their Packaging After Disposal by Consumers*. Official Gazette of the Union.
- https://www.planalto.gov.br/ccivil_03/_ato2019-2022/2020/decreto/d10388.htm
- Brazilian Diabetes Society—Professional (2023). *Guidelines and Positions—Brazilian Diabetes Society—Professional, No. 7, 2019-2020*.
- <https://profissional.diabetes.org.br/diretrizes-e-posicionamentos/>
- Catão, T. P., Mosegui, G. B. G., Vianna, C. M. M., Cunha, G. N., Figueiredo, M. M. S., & López, A. J. G. (2022). Profile of Federal Insulin Purchases in Brazil: The Impact of Biosimilar Entry. *Research, Society and Development, 11*, e1511427073.
- <https://doi.org/10.33448/rsd-v11i4.27073>
- Environmental Research & Education Foundation (2018). *Household Needles in Municipal Solid Waste (MSW): Policy, Controls, and Material Recovery Facility (MRF) Safety*.
- <https://nrcne.org/wp-content/uploads/2019/12/EREF-SWANA-Needles-in-MSW-FIN-AL.pdf>
- Estequi, J. G., André, S. C. S., Souza, R. S., & De Figueiredo, R. M. (2018). Resíduos gerados por usuários de insulina em domicílio [Waste Generated by Insulin Users at Home]. *Reme: Revista Mineira de Enfermagem, 22*, e-1120.
- Hassan, N. M. et al. (2021). Toward Safe Environment: Injection Device Disposal Among Diabetic Patients Attending Tertiary Care Academic Clinic in Middle Delta, Egypt. *Environmental Science and Pollution Research, 28*, 23193-23203.
- <https://doi.org/10.1007/s11356-021-12393-z>
- Health Pen (2023). <https://www.canetadasaude.com.br/>
- Health Surveillance Center (2008). *Health Surveillance Center of the Coordinatorship of Disease Control of the State Department of Health*. Order No. 21 [HSC Order No. 21].
- <https://cvs.saude.sp.gov.br/zip/cvs-21.pdf>
- Huang, J., Yeung, A. M., Nguyen, K. T., Xu, N. Y., Preiser, J. C., Rushakoff, R. J. et al. (2022). Hospital Diabetes Meeting 2022. *Journal of Diabetes Science and Technology, 16*, 1309-1337. <https://doi.org/10.1177/19322968221110878>
- Jefferson, I. G., Marteu, T. M., Smith, M. A., & Baum, J. D. (1985). A Multiple Injection Regimen Using an Insulin Injection Pen and Pre-Filled Cartridge Soluble Human Insulin in Adolescence with Diabetes. *Diabetic Medicine, 2*, 493-495.
- <https://doi.org/10.1111/j.1464-5491.1985.tb00690.x>
- Klonoff, D. C., Heinemann, L., Cook, C. B., Thompson, B. M., Kerr, D., Han, J. et al. (2020). The Diabetes Technology Society Green Diabetes Initiative. *Journal of Diabetes Science and Technology, 14*, 507-512. <https://doi.org/10.1177/1932296820904175>
- Maia, F. F. R., & Araújo, L. R. (2002). Use of Insulin Pen Injector in the Treatment of Type 1 Diabetes Mellitus. *Journal of Pediatrics, 78*, 189-192.
- <https://doi.org/10.2223/JPED.828>
- Minayo, M. C. S. (2006). *O desafio do conhecimento: pesquisa qualitativa em saúde* (9ª ed.). EDUC.
- Ministry of Health (2007). *Ordinance No. 2.583, October 10, 2007. Defines the List of Medications and Supplies Available Through the Unified Health System, in Accordance with Law No. 11,347 of 2006, for Users with Diabetes Mellitus*. Ministry of Health. http://bvsm.sau.de.gov.br/bvs/sau.delegis/gm/2007/prt2583_10_10_2007.html
- Ministry of Health (2017). *Ordinance SCTIE/MS No. 11, March 13, 2017. Publishes the*

- Decision to Incorporate Human NPH Insulin Pen and Regular Human Insulin Within the Scope of the Unified Health System—SUS*. Official Gazette of the Federative Republic of Brazil.
https://bvsm.s.saude.gov.br/bvs/saudelegis/sctie/2017/prt0011_14_03_2017.html
- Ministry of Health (2022). *Technical Note No. 169/2022-CGAFB/DAF/SCTIE/MS. Update on Distribution and Suggested Criteria for Dispensing Human NPH Insulin Pen (Human NPH Insulin 100 IU/ML, 3 ML Cartridge), Regular Human Insulin (Human Regular Insulin 100 IU/ML, 3 ML Cartridges), and Stainless Steel Needles for Pen Application*.
<https://www.gov.br/saude/pt-br/composicao/sectics/daf/cbaf/medicamentos-e-insumos-adquiridos-pelo-ms/arquivos/nota-tecnica-no-169-2022>
- Ministry of Labor and Employment (2005). *Ordinance No. 485, November 11, 2005. Approves Regulatory Norm No. 32—Safety and Health at Work in Health Establishments*.
https://www.saude.mg.gov.br/index.php?option=com_gmg&controller=document&id=839
- Ministry of the Environment (2022). *Decree-Law No 11.043, April 13, 2022. Department of Environmental Quality. National Solid Waste Plan—NSWP*. Ministry of the Environment. <https://portal-api.sinir.gov.br/wp-content/uploads/2022/07/Planares-B.pdf>
- National Council for the Environment (2005). *Resolution No. 358/2005*.
http://conama.mma.gov.br/?option=com_sisconama&task=arquivo.download&id=453
- National Health Surveillance Agency (2004). *Resolution RDC No. 306, December 7, 2004. It Provides for the Technical Regulation for the Management of Health Service Waste*.
https://bvsm.s.saude.gov.br/bvs/saudelegis/anvisa/2004/res0306_07_12_2004.html
- National Health Surveillance Agency (2018). *RDC No. 222, March 28, 2018. Regulates Good Practices for Management of Health Service Waste and Provides Other Provisions*. Ministry of Health.
http://antigo.anvisa.gov.br/documents/10181/3427425/%282%29RDC_222_2018_.pdf/679fc9a2-21ca-450f-a6cd-6a6c1cb7bd0b
- Pacheco, C. D. H., Novais, M. A. P., & Liberal, M. M. C. (2021). Reverse Logistics in Healthcare and the Fight Against Covid-19. *Brazilian Journal of Development*, 7, 15126-15139. <https://doi.org/10.34117/bjdv7n2-233>
- Program for the Care of People with Non-Communicable Chronic Diseases. Arterial Hypertension and Diabetes Mellitus* (2021). Municipality of Ribeirão Preto.
<https://www.ribeiraopreto.sp.gov.br/portal/pdf/saude-h-01202104.pdf>
- Santos, L. N., & Ruiz, J. B. (2020). Characterization and Quantification of Sharps Waste Generated by Individuals with Diabetes in the Municipality of Umuarama, PR, Brazil. *Ciência & Saúde Coletiva*, 25, 2813-2819.
<https://doi.org/10.1590/1413-81232020257.10402018>
- São Paulo (2001). *Law No. 10.782, March 9, 2001. Defines Guidelines for a Comprehensive Policy of Prevention and Integral Care for Individuals with Diabetes within the Scope of the Unified Health System and Provides Other Provisions*. State Government.
<https://governo-sp.jusbrasil.com.br/legislacao/132262/lei-10782-01>
- Sustainable Development and the United Nations' Sustainable Development Goals* (2023).
https://www.undp.org/sustainable-development-goals/climate-action?gclid=CjwKCAjwgsqoBhBNEi-wAwe5w0x2cdbVSD5gpGTJeepz5AL0Dc1xU1A4wbCaqa94fpFEs_9z0TaufmBoCnMQQAvD_BwE