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## BOOSTING ENERGY TRANSITION OF THE DAIRY VALUE CHAIN: A LIFE PROJECT

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Abstract – The dairy sector faces several challenges, including economic instability, environmental concerns, and climate impacts, while striving to meet the EU's Green Deal and Sustainable Development Goals (SDGs). Nowadays, the sector contributes significantly to greenhouse gas emissions, mainly from dairy cow breeding and energy-intensive processes like milk processing. Yet, it is also vulnerable to climate change effects, including heat stress in livestock, reduced water availability, and declining soil fertility. To address these challenges, the sector must focus on sustainability, resilience, and decarbonization. Key strategies include reducing production costs, improving resource efficiency, mitigating environmental impacts, and adopting energy-efficient technologies. Beyond technological advancements, enhanced transparency and collaboration across the supply chain are critical. Open communication and data sharing among farmers, processors, distributors, retailers, and consumers can facilitate the development and implementation of sustainable practices. Stronger partnerships and collaborative initiatives can foster innovation, drive investment in sustainable solutions, and ensure that the dairy sector not only survives but thrives in a future marked by climate change and increasing societal expectations for environmental responsibility. Only through such a comprehensive and collaborative approach can the dairy sector effectively address its challenges and achieve its sustainability goals. The LIFE-CET-2022-funded BETTED project aims to accelerate the dairy sector's energy transition by fostering the adoption of renewable energy and energy-efficient measures like heat pumps for milk processing and dairy product production. Targeting small and medium enterprises, the project emphasizes capacity-building, investments in sustainable technologies, and reducing fossil fuel dependency, ensuring the sector's economic and environmental viability. This paper aims to present the toolbox developed under the project. Furthermore, this paper reviews existing Life Cycle Assessment and Environmental Product Declaration studies to analyze the environmental impacts of dairy products using a consistent cradle-to-grave system boundary and functional unit for comparability. This analysis establishes benchmarks for key indicators like the Global Warming Potential to assess dairy system sustainability. This research contributes to scientific knowledge by enhancing the accuracy and consistency of environmental impact assessments in the dairy sector, thanks to the standardized toolbox and the comparable benchmarks provided. Furthermore, the developed benchmarks offer practical applications for industry stakeholders, policymakers, and consumers, enabling informed decision-making towards more sustainable dairy production and consumption practices.

*Keywords – Dairy industry; decarbonization; energy efficiency; energy transition; life cycle; value chain.*

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