

Environmental Assessment of Tomato Crop Production in a Venlo Glasshouse

Assumpció Antón, Marta Torrellas and Juan Ignacio Montero
IRTA Carretera de Cabrils, km 2
08340 Cabrils, Barcelona
Spain

Marc Ruijs, Peter Vermeulen and Cecilia Stanghellini
Wageningen UR Greenhouse Horticulture
PO box 644, 6700 AP Wageningen
Building 107, Droevendaalsesteeg 1, 6708 PB Wageningen
The Netherlands

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Abstract

The objective of this study was the environmental assessment of the current situation of tomato production in a Venlo greenhouse located in temperate climate. This study was developed in the context of the EUphoros project, which aims to develop a sustainable greenhouse with a reduction of external inputs yet with high productivity and an efficient use of resources. The environmental analysis was conducted using the Life Cycle Assessment (LCA) methodology. The crop production system was structured in several stages or processes in order to facilitate the study and interpretation of the results obtained. The stages considered were: the structure, auxiliary equipment, climate system, fertilizers, phytosanitary treatments and waste. The main results and issues that could be improved are described and presented in this paper. They can be summarised as follows: climate system entailed a large demand of natural gas which made important contributions to the impact categories: Eutrophication, Abiotic Depletion, Global Warming and Cumulative Energy Demand (44% to 96% of the total). Rock-wool substrate accounted for between 45% and 58% of the auxiliary equipment contribution. There is a large energy demand associated to the expansion of the mineral in the manufacturing process. The structure was a relevant burden due to the high amount of steel and glass in it. The use of a cogeneration system to heat the greenhouse could significantly offset natural gas consumption and its environmental impact because of the large amount of electricity produced. More efforts should be made in the recycling and the manufacturing processes of rock-wool. Furthermore, investigation should be oriented to develop efficient technologies to improve the intensive use of materials and energy. This paper investigates the effect of reducing the consumption of energy and the volume of substrate per plant in the environmental impact of tomato production in a Venlo greenhouse.