How Does a Decision-Making Tool Enhance Spent Mushroom Substrate Valorization into Polysaccharides?

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The feedback from the decision-making tool indicates that it significantly enhances both engagement and understanding in the domain of cleaner production.

The survey responses suggest that the decision-making tool plays a beneficial role in cleaner production education. The majority of respondents, 55%, fully understood the tool, while 36% mostly understood it, indicating a generally high level of user engagement and comprehension. A significant 73% of users find the simulation results reliable, and an overwhelming 82% express interest in more interactive interfaces during lectures. Additionally, the platform is considered valuable, with 64% rating it as 'very valuable' and 36% as 'valuable' for information sourcing and decision-making support.

The decision-making tool provides insights into various important factors related to the environment and socio-economic issues. It shows how these factors are connected, not just for turning spent mushroom substrate (SMS) into polysaccharides, but also for the whole area of cleaner production. This helps users understand the overall impact and benefits of sustainable production methods.

Access the user interface via the QR code.

Introduction

To produce 1 kg of mushrooms, 5 kg of substrate are required. Along with the rapid development of the mushroom cultivation industry, it is expected that in less than three years, the amount of waste generated from mushroom cultivation may reach even more than 100 million tons. The substrate, often underutilized and disposed of by burning, can be re-evaluated by extraction of plysaccharides.

How does the implementation of a decision-making tool influence the understanding and reliability perception of valorizing SMS into polysaccharides among students in cleaner production course?

Model Development

A System Dynamics Model* has been developed to evaluate environmental and socio-economic impact of SMS valorization into polysaccharides.
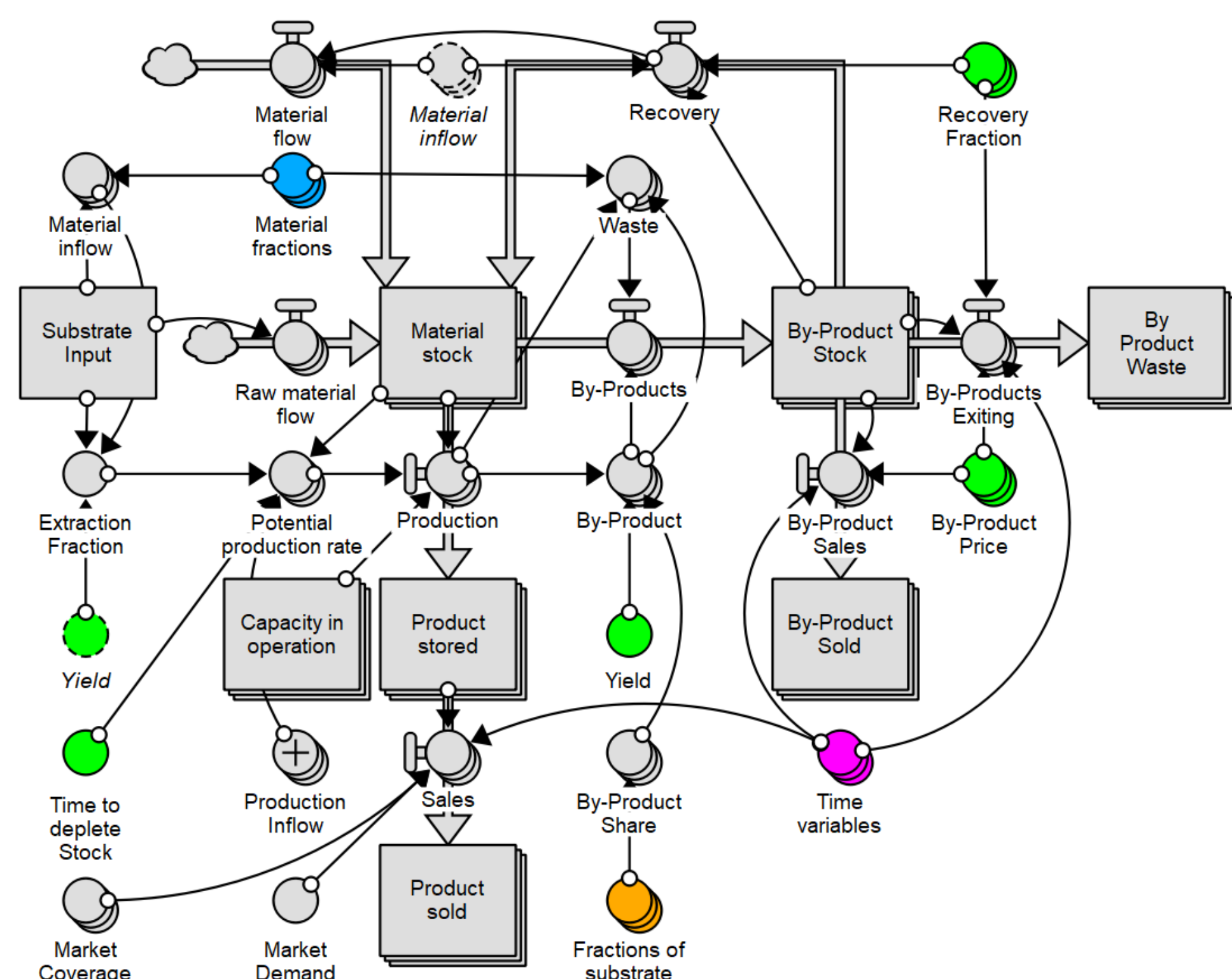
*In this figure, only a production segment of the model is depicted.

User Interface

The User Interface allows access to the model and provides an in-depth introduction to the study topic. This interface serves as a decision-making tool where users can test various scenarios. The model functions as an engine, delivering results based on user input.
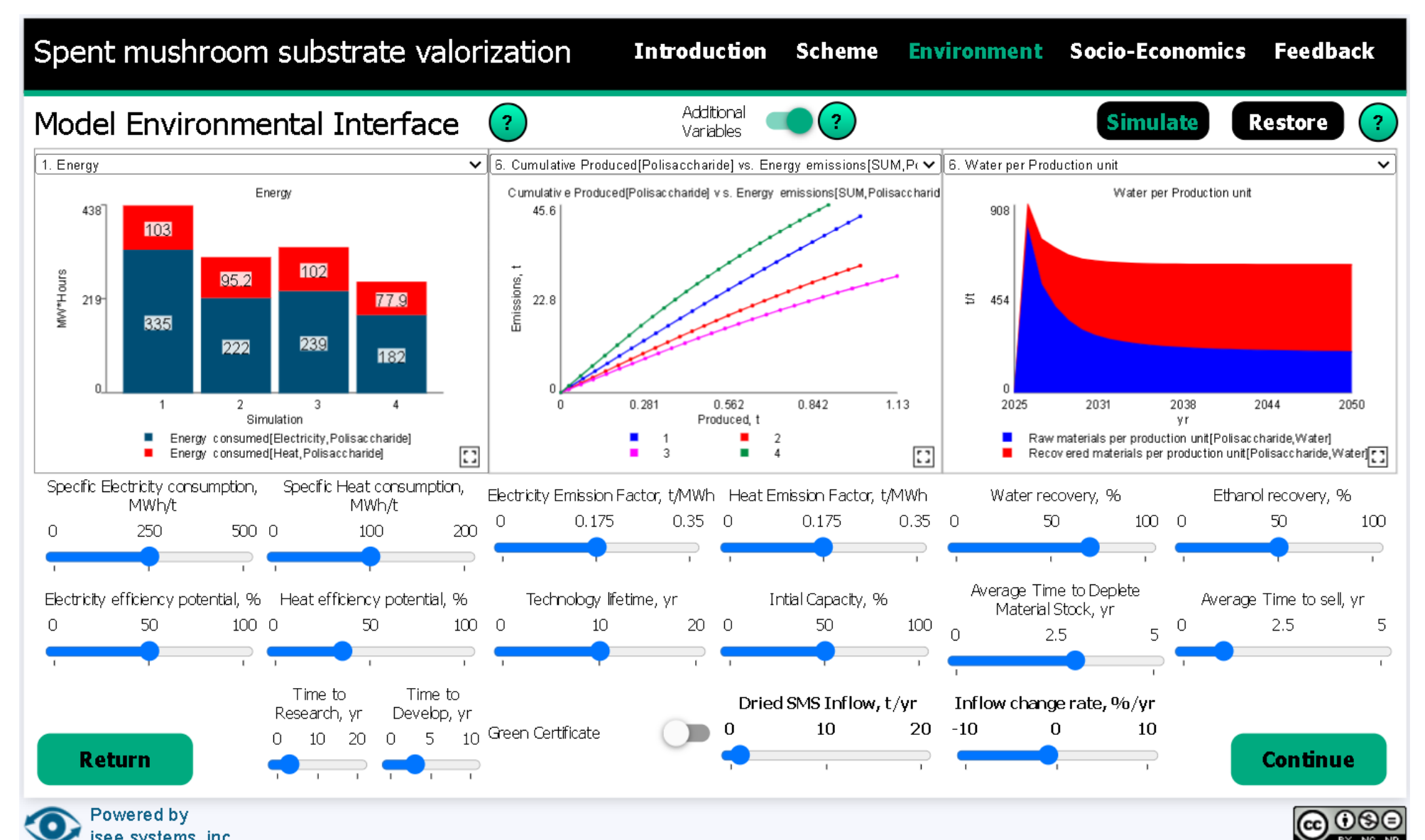
Results

The interface was demonstrated to students pursuing a Master's degree in Environmental Engineering, who were subsequently given a feedback survey. Out of the 20 questions, responses to four are presented below. Eleven students responded to the survey.

3. How would you rate the tool's understandability?
- I have understood everything — 55%
- I did not understand the tool, the tool was very confusing — 9%
- Mostly I understood everything, but some parts were confusing — 36%

9. Do the simulation results provided by the tool seem reliable to you?
- Yes — 73%
- No — 9%
- Partly — 18%

14. In general, how do you rate this platform as a source of information and a tool to support decision-making?
- Very valuable — 64%
- Valuable — 36%
- Low value
- Not valuable at all

15. Would you like to have more interactive interfaces presented during lectures?
- Yes — 82%
- No — 18%