

Introducing Sustainability Assessment and Selection (SAS) into Chemical Engineering Education

M.R. Othman^{a, c, *}, L. Hady^a, J.-U. Repke^b, G. Wozny^a

^a Chair of Process Dynamics and Operation, Technische Universität Berlin, Germany

^b ITUN, Technische Universität Bergakademie Freiberg, Germany

^c Process Systems Engineering Group, FKKSA, Universiti Malaysia Pahang, Malaysia

ABSTRACT

Assessment of a sustainable process design centres on the three pillars of sustainability. However, satisfying all criteria is sometimes difficult. Nevertheless, it is important to have an effective and systematic tool for a concrete and justifiable decision. Introduction of such tool into chemical engineering education would be beneficial as students will encounter situations in making decision which may imply deciding on the best process design, suppliers, supply chain, etc. In light of this matter, we introduce a concept called sustainability assessment and selection (SAS) into Computer Aided Plant Design (CAPD) course at Technical University of Berlin. The idea of the methodology is to assess process designs and select one which is most sustainable. Within the framework of this course, a 1-day lecture has been conducted that touch on the methods to assess sustainable process design. It is also aimed to introduce systematic multi-criteria decision making methodology called analytic hierarchy process (AHP). A practical example in choosing n-butane isomerization process designs is illustrated. From the class evaluation we found that the response towards the idea was very promising. We believed the method would add an extra edge to the students especially in performing sustainability assessment and systematically solving multi optional problems that they may encounter in their career.

KEYWORDS: Education; Sustainability assessment; Process design; Analytic hierarchy process (AHP)

DOI: 10.1016/j.ece.2012.05.003