

464e Analysis of a Petrochemical and Chemical Industrial Zone for the Improvement of Sustainability

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Sustainability is critical for the long-term development of individual industries. Although each individual company is more or less self-operated and self-adapted, due to supply and demand, they are interconnected naturally due to various mass and energy flows. With the evolution of technologies and the emergence of diverse end-products from basic chemicals and materials, the knots among various industrial activities are becoming increasingly tight and complicated, and the economic, environmental, and societal issues are becoming increasingly intertwined. These phenomena occur worldwide, and they are even more intense in some heavily concentrated manufacturing regions. Therefore, such a regional infrastructure can be a good “showcase” for studying sustainability.

Particular concern exists regarding the sustainability of highly concentrated areas of chemical and petrochemical industries. In this paper, the sustainability of an industrial region including several refineries, two paper mills, and a number of chemical companies which produces both intermediates and specialty chemicals are studied. To properly perform the analysis, both historical and current data on the technical, economic, environmental, and societal aspects are analyzed. To improve sustainability, two types of strategies have been identified and will be delineated in detail. One is for the area industries to work closer in order to enhance the existing network, that is, effectively utilizing all of the available resources, including everything from raw materials to the products and wastes. The other is to embrace new technologies into the existing infrastructure, such as the production of biofuel and nanotechnology.