

Modular Construction: An Economic Solution to Regionalized Small Scale Chemical Production

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Economies of scale have always driven the expansion of plant production capacity in the global chemical processing industry. Plants often known as mega-scale plants, typically located in the gulf coast states within the United States of America, have historically enjoyed industry leading capital and operating costs per unit quantity produced. However, modular construction is now poised to disrupt that paradigm.

The cost economies of modular construction result from fabrication in a controlled environment, which is not subject to the site construction inefficiencies of permit delays, hot work, work at elevation, weather and regionalized high cost labor (e.g. gulf coast). Combined, these cost economies represent opportunities for schedule compression and therefore substantial improvements in time to market.

Additional cost economies are gained from using strategically located, regional, small scale production facilities which benefit from lower cost raw materials (e.g. Marcellus natural gas in the eastern United States) and minimized product transportation to end user cost.

Consider the examples of methanol and ethylene oxide processes that both require moderate to high equipment design pressures. Traditional economies of scale recognized at lower equipment design pressures do not translate to high pressure equipment, principally driven by the impact of wall thickness upon material and labor costs. These small scale designs can also realize capital efficiency via process simplification, such as simplified heat integration, as the small scale OPEX models are not as cost sensitive, compared with world scale systems.

Koch Modular Process Systems will present a brief overview of the complete plant methanol and ethylene oxide technologies we have developed together with our

technology licensor partners, modular system scopes of supply, project execution schedule and strategy, and basic CAPEX and OPEX metrics at specific small scale production capacities.