

## Technical Q&A: Scaling Up Biorefining

# Q: How can I minimize risks when scaling up my biorefining plant from pilot to commercial operation?

**A:** Biorefining is arguably the most promising option to provide a non-petroleum source of fuel and chemicals. As technology advances and petroleum prices rise, more suppliers are investigating the possibility of incorporating biorefining as part of their manufacturing portfolio.

There are risks with any pilot to commercial scale-up effort, but in the biorefining industry failure to anticipate and mitigate risks is exacerbated because of the technologies employed and capital constraints. The most important thing is to fully vet and understand the process you plan to use in your biorefining plant — understand the capabilities and limitations of the materials and processes you plan to deploy.

Most organisms utilized in biorefining today not only produce a primary product, but also byproducts that must be dealt with — either for use as salable product or as a waste to be treated. Identifying products and managing waste streams is done most efficiently in the lab prior to scale up where the technology can be more easily manipulated.

Once the scale up process begins, it is important to “freeze” the process design as early as possible to minimize changes during project execution that may result in schedule delays and additional cost. The overall commercialization schedule should include enough time to operate the various phases to vet the process at that scale so that required changes can be designed into the next stage of development. In other words, the owner should

not move from pilot to demonstration to commercial without a thorough understanding of how the process performs at each step.

Because biorefining facilities are inherently complex, a team approach that leverages research and development, process development and capital project execution knowledge is the best way to minimize risk.



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