

Speed up process development: modelling and simulation

Development of pharmaceuticals, fine chemicals, bio-based and other similar businesses are repeatedly failing to respond in time to market demands with regards to their innovative ideas, new products and processes. Long and costly development procedures are mainly responsible for this issue. Running extensive and inefficient lab and pilot tests are mainly associated with incapacity to look at the entire production process as one or on a higher design level. Inadequate scale up from lab to demo and demo to commercial size processes will result in reworks, redesigns and loss of time and money.

Lab tests provide insights about how each process operation step (reactions, heating or separation) behaves at a relatively small scale. However, they will not reveal the impact of these operation steps on the production process as a whole. Most of the challenges emerging at demo or commercial plants, in relation to basic process operations such as mixing, heating and separation are not visible at the lab scale. Nevertheless these can be foreseen and identified by simulating and modelling the process in the early development stages.

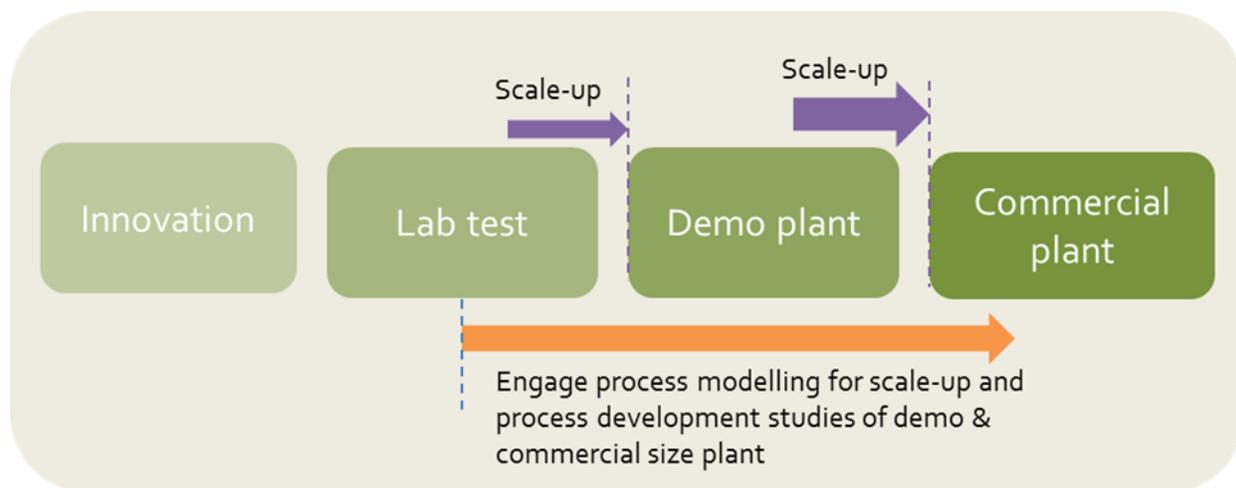


Figure 1 Involving modelling at the early development stage provides efficient and structured scale-up and design of demo facilities and commercial size plants

Using sophisticated modelling and simulation tools Maturus Optimi offers a fast and effective solution for process analysis at the earliest stages of process development. The results of the analysis can be used to improve coordination and guidance of R&D. Obtaining more accurate process specifications will result in more efficient design of the pilot, demo and commercial size plant. For example, simulation results can identify an optimal operating window of a reactor, leading to minimum operating and energy costs of the entire process. Using this information research can set spe-

cific targets for the reaction system, and concentrate their efforts on achieving these targets through experiments, lab test, etc. This approach doesn't only have an overall positive effect on the time and budget needed for process development but also on the quality; all this simply by guiding the research in structured and factual manner.

In addition, process simulation and modelling has many other aspects and benefits that can help the project moving faster through the development phases. Some of the most obvious benefits are:

- identifying process and technology limitations that can emerge with up scaling
- identifying missing operating steps
- equipment sizing for demo/commercial plant
- indicating optimal process conditions (T, p, reaction time, cycle time, etc.)
- identifying optimal / possible operating windows
- access to physical property databanks for large number of chemicals
- utility needs (electricity, steam, gas, etc.)
- identify waste streams and waste treatment requirements
- identify potential logistics challenges
- process economics and viability at the very early stage

Solutions for SMEs – Leverage to success

Modelling and process development expertise is typically used within larger organizations. Small and medium enterprises (SME) often can't afford to develop this expertise, since the cost of software, maintenance and experts are high in relation to the frequency it is needed within the company.

Maturus Optimi's expertise is a result of many years of working in these particular areas, developing new processes and using expert modelling and simulation software. We offer cost effective modelling and process development solutions to SMEs that can be your leverage to success. Get into a higher gear using Maturus' experience and complete solutions; be ahead of competition!

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