

# Operational and Manufacturing Excellence Webinar Series



## Optimizing Plant Operations Including Design Considerations for Growth

American Coatings Association Webinar | July 25, 2023

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Webinar



ChemQuest

# Operational and Manufacturing Excellence

## American Coatings Association Webinar Series

Thursday, June 22

Process Optimization & Overall Equipment Effectiveness

Tuesday, July 25

Optimizing Plant Operations Including Design Considerations for Growth

Tuesday, September 19

Optimizing Supply Chain to Increase the Bottom Line

Tuesday, October 17

Safety First! – Best Practices in Environmental, Health and Safety



Chem  Quest

*actionable insights for success*

<https://chemquest.com>



# ChemQuest: Navigating the intersection of strategy, markets, operations, & technology



## Our Mission is Enabling Our Clients to:

- **Build enterprises** that challenge established thinking and drive transformation.
- **Gain competitive advantage** through distinctive, targeted, and substantial improvements that sustain profitable growth.
- **Unlock new and hidden insights** empowering an organization's smart risk-taking, catalyzing innovation excellence and value creation.
- **Be successful** — because our success emanates from yours.

## ChemQuest by the Numbers

1976

Year the firm was established

~130

Total consultants and technical staff

25

Minimum years of experience in specialty chemicals for senior personnel

100%

Percent of our work that is proprietary, offering a full portfolio of services under NDA

## Four Pillars of Expertise

Deliver distinctive, thorough, actionable, confidential, and professional work and support our clients in every aspect of sustained, profitable growth, including:



Business  
Strategy &  
Transformation



Technology  
Development



Operational &  
Manufacturing  
Efficiencies



M&A Advisory  
Services

## Don't invest in potentially unnecessary CAPEX to support expansion and/or growth. First, make certain that the existing assets are running optimally.

Perform a complete review of existing production outputs or other areas of manufacturing to ensure that lack of execution is not the reason for expanding.



Review historical run rates and review trends



Analyze current outputs against name-plate capacities and determine potential gaps or underperforming assets



Act on non-conformances with performance improvement initiatives



Build "what if" forecasting figures into the production plan to reflect increased productivity



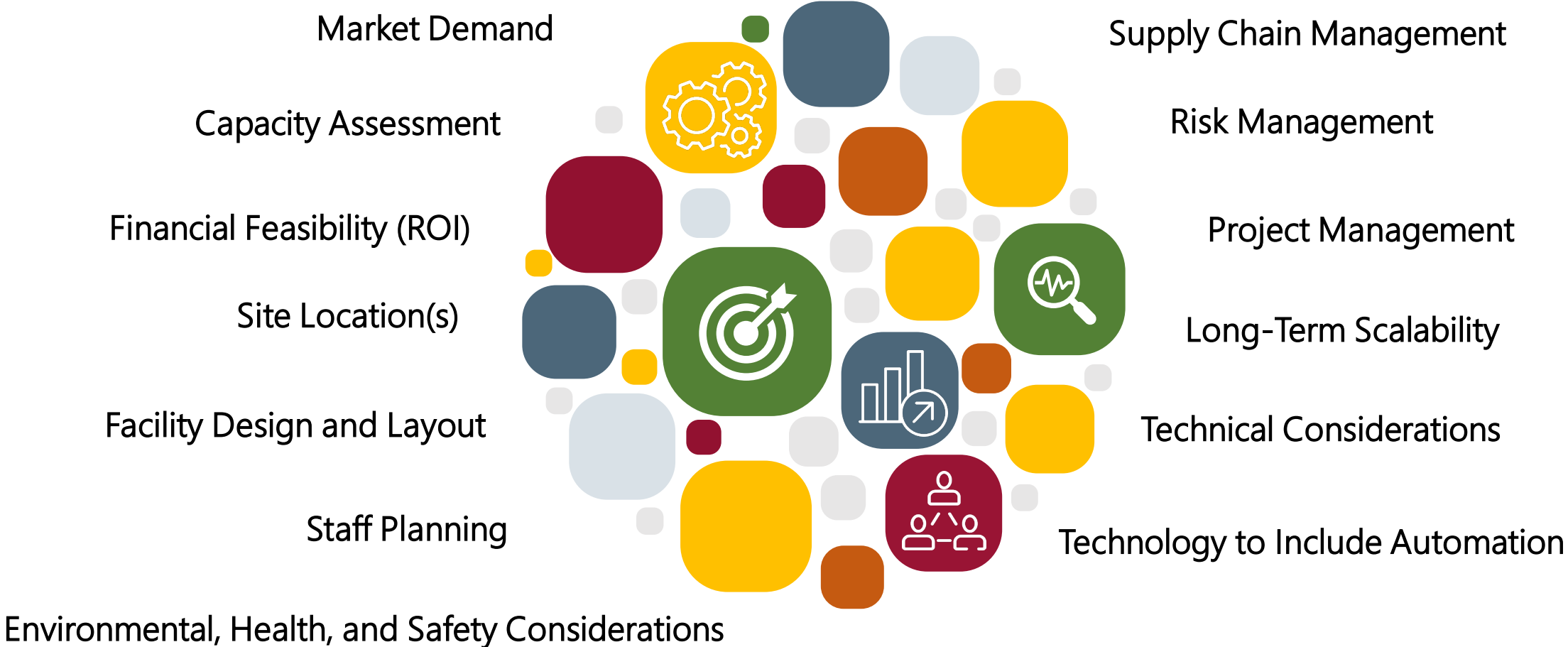
In the event of warehouse expansion or additional rent/lease requirements, ensure inventories and supply chain measures are robust and not inflated

- Over production
- Obsolete inventory
- Logistics issues
- Other

Performing due diligence before authorizing funds for expansion can reduce or even eliminate unneeded CAPEX spend.

# When planning a manufacturing facility expansion for growth, performing a thorough due diligence of the most important areas is critical.

The most basic expansion and growth elements for consideration include:



## Market demand requires an accurate assessment of projected growth for your products.

- Review internal growth projections using both historical run rates and future forecasts
- Use external forecasting (possibly by using a third party such as ChemQuest that specializes in independent and objective fact finding)
- Perform a competitor analysis using both unbiased internal and external resources to make sure there is proper demand for industry capacity
- Talk with existing customers and potential targets for growth forecasts and trends



It is critical to address these important steps before advancing to making concrete investments.

## Conduct an existing/current capacity assessment, including accurate production outputs.

- Review existing production performance and identify constraints or bottlenecks
  - Fix all problems and recalculate outputs with improvements made in the calculations
    - Yields, cycle times, turn around and downtime, maintenance, and “First Time Right”
- Perform rough initial capacity requirements to meet projected demand



Missing the target on capacity outputs can be costly, either through over-investment in assets not yet required OR through under-investment and missing out on business.

## Don't commit to an expansion before performing an ROI or a financial feasibility on the investment.

- Conduct a thorough financial analysis of the following areas (at a minimum):
  - CAPEX
    - Construction costs
    - Land and buildings
    - Equipment
  - Operational expenses
    - Labor
    - Utilities
    - Raw materials
    - Other ongoing expenses
- Determine if the expansion is viable and aligns with the company's profitability expectations and long-term strategy. Include accounting/controllers support.

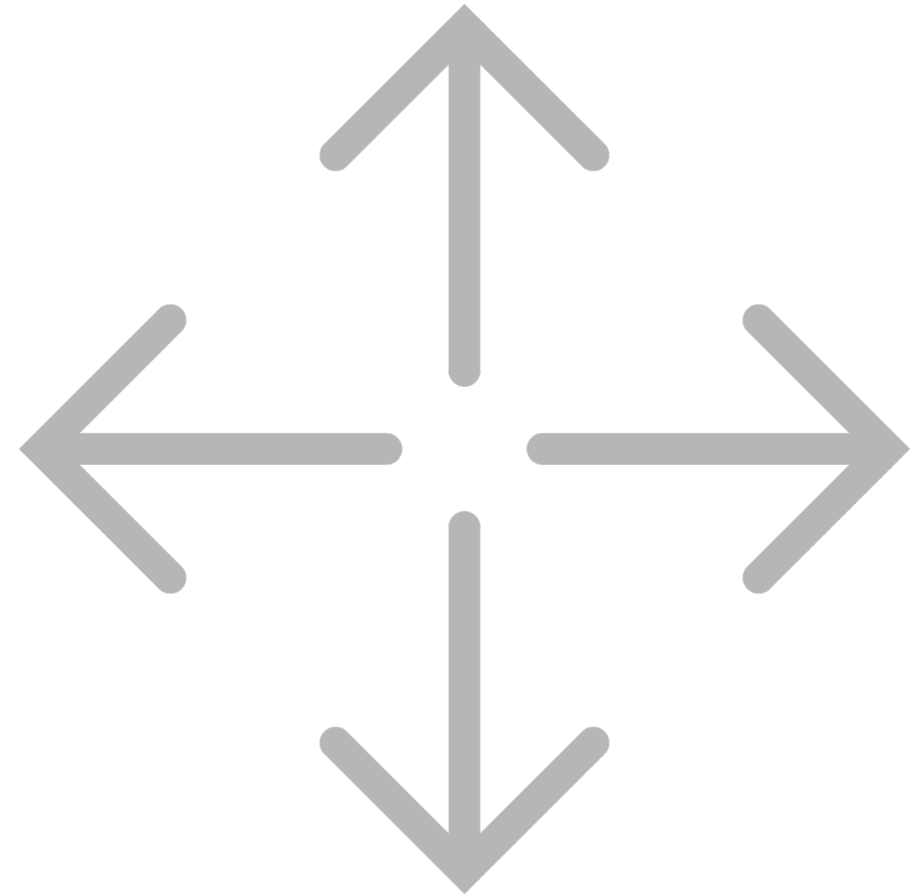


Going through these steps effectively will be a worthwhile exercise, saving significant time and potentially costs.



## Choosing the right site/location is a key factor to a successful expansion outcome.

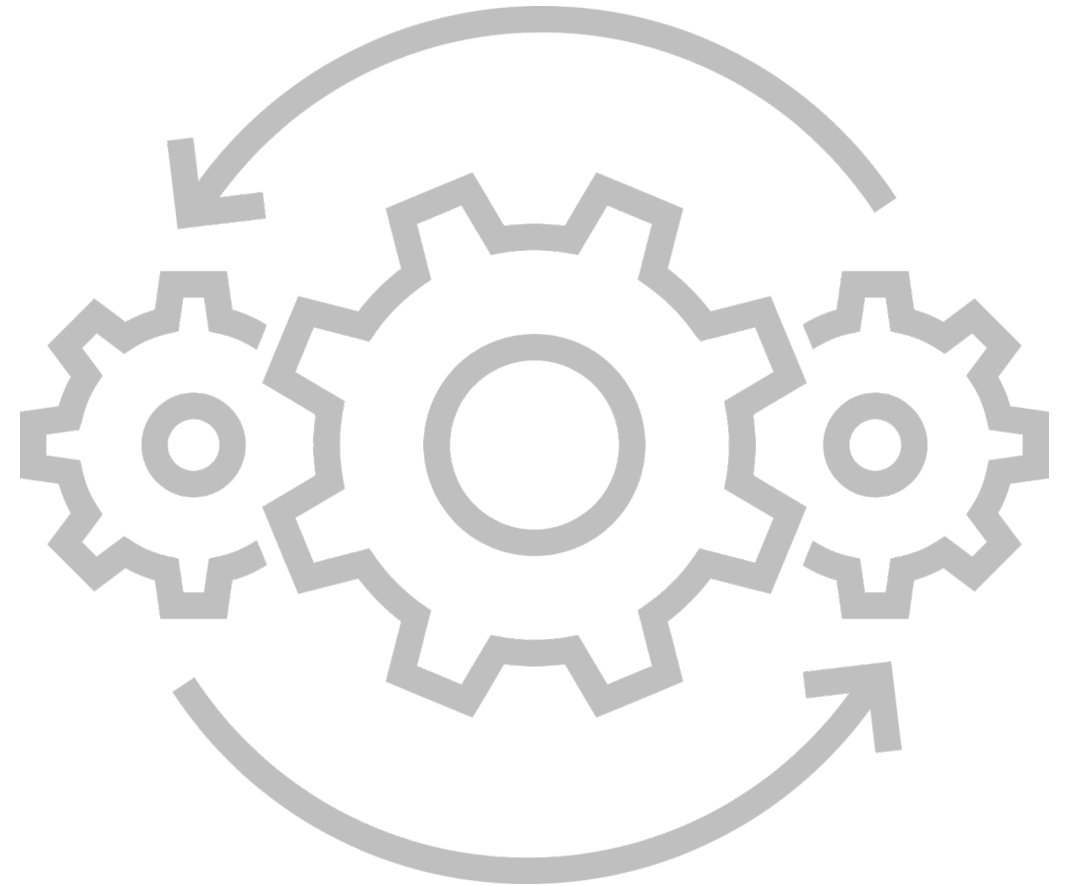
- Get support from the community and governmental agencies
  - Community stewardship
  - Growth/viability in community
  - Governmental support
    - Tax incentives
    - Potential support in the form of subsidies and worker training etc.
- Business factors to consider
  - Proximity to customers and suppliers
  - Labor pool availability
  - Local politics and trip points
  - Transportation and logistics such as local warehousing



Taking a holistic approach to site/location within the community will have tangible benefits.

## Do the upfront work and due diligence on facility design and layout.

- Develop a **lean approach** using minimal steps with an effective line layout
- Optimize material flow using workflow diagrams
- Minimize production bottlenecks
- Plan for expansion in site layout
- Machinery placement
- Storage areas
- Safety first
- Education levels of local employees



Taking the time and energy to properly build a facility or expansion for productivity will save on time, money, and even safety issues.

# Evaluate the newest technology and automation tools available for optimal productivity.

## But don't get carried away!

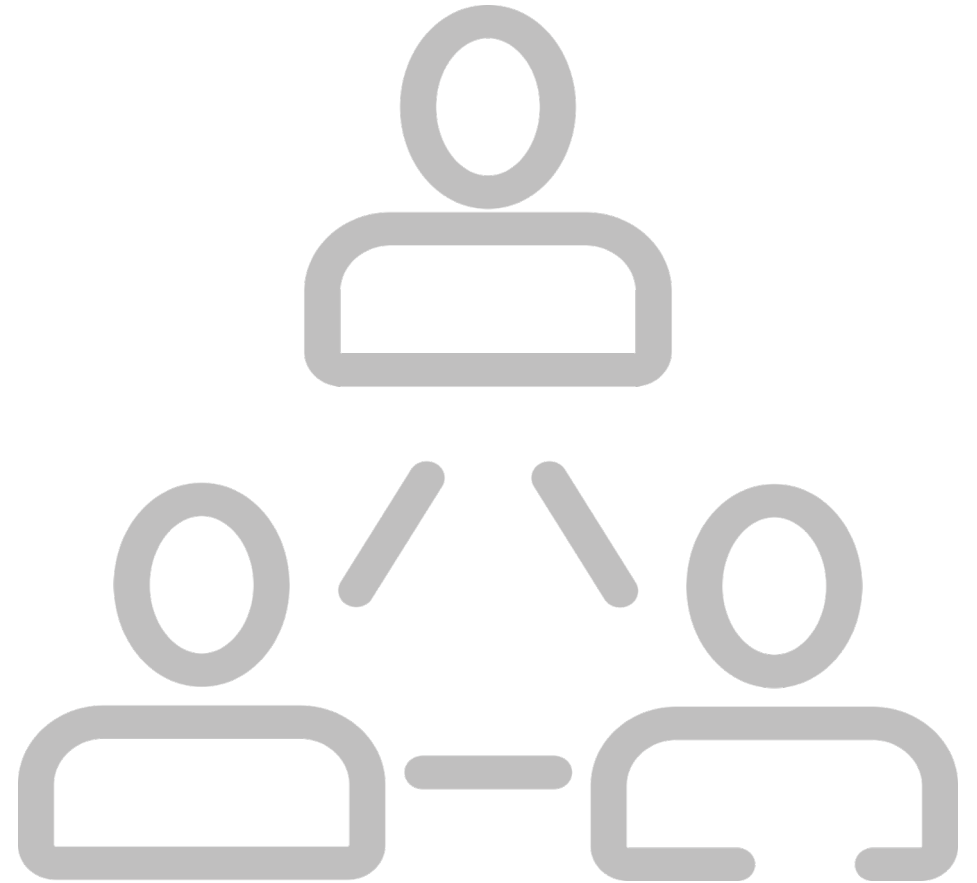
- Investigate alternate processing technologies
  - Smart manufacturing technologies
- Automate systems for productivity
  - Robotics
  - Cost reduction
  - Data analytics
  - Process automation to streamline operations
  - Support scalability
- Improved quality
  - Adopt a “First Time Right” mentality
  - Invest in quality equipment (e.g., vision cameras)



Investing appropriately in technology and automation will help you stay ahead of the competition.

## Plan your staff/workforce using human resources and community outreach facilities.

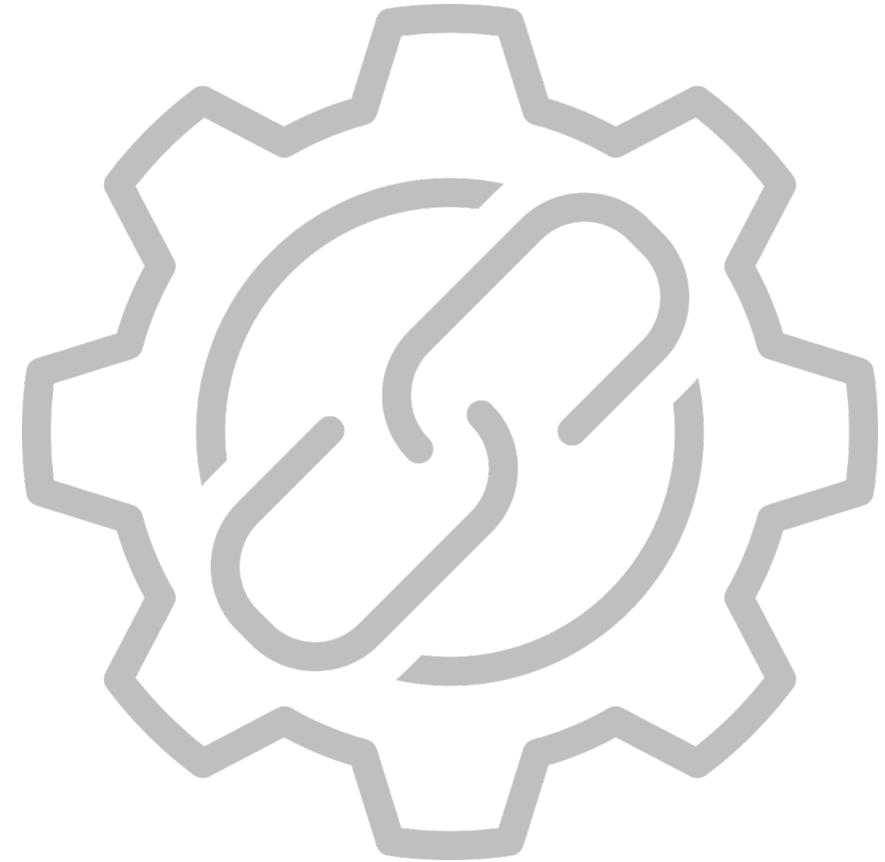
- Perform a skills and labor assessment for the new/expanded facility
- Identify training requirements and act
- Determine if additional leadership (site management) is necessary and recruit accordingly
- Consider workforce development programs
- Explore talent retention strategies
- Develop employee morale and productivity incentives (can be non-monetary or productivity incentives with payouts such as profit sharing)
- Get input from local businesses



Recruiting and retaining talent is essential for long-term success.

## Effective supply chain management is critical to both productivity and customer satisfaction.

- Review existing supply chain inefficiencies
- Remove any bottlenecks or risks associated with production
- Integrate supply chain strategy with suppliers
- Effectively manage inventory levels
- Optimize sourcing of raw materials
- Understand and meet customer delivery requirements



Well-designed and orchestrated supply chain management avoids unnecessary waste and serves a customer-driven culture.

## Environmental, health, and safety (EH&S) considerations should not be overlooked.

Environmental considerations need to be understood and followed

- Regulations and laws: federal, state, and local
- Permits
- Safety standards to include government agencies such as OSHA
- Consider sustainability in manufacturing processes with a carbon footprint reduction culture
  - Waste generation
  - Energy efficiency
  - Environmental impact mitigation



Following strict EH&S standards is not only the right thing to do—it is also good business practice.

## Develop a risk management plan in case the landscape changes.

Identify possible risks and develop contingency plans to mitigate them

- Market swings and volatility
- Supply chain disruptions, even *force majeure*
- Technological obsolescence
- Regulatory changes
- Governmental policies
- Natural disasters
- Financial uncertainties
- Attitude of local government and media



Even the best laid out plans can go astray, so be prepared to help mitigate evolving situations.

## Project management entails the development of a comprehensive project plan.

- Project timelines and deliverables
- Key milestones
- Resource allocation
- Coordination of stakeholders
- Construction contractors
- Equipment suppliers
- Regulatory agencies
- “What ifs” and contingency plans



Communication is key to executing an effective project expansion.



## Think strategically and plan for long-term scalability.

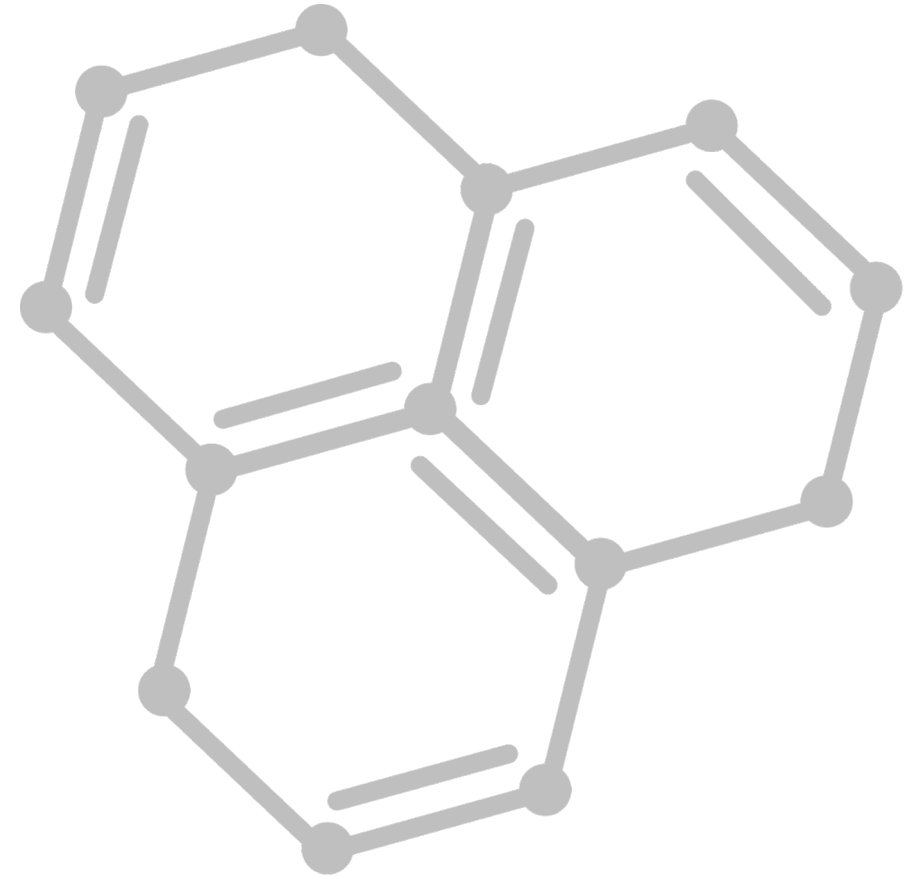
- Prepare and anticipate future growth and expansion using analytics and forecasting
- Design the facility or assets with flexibility and scalability in mind (long-term vision)
- Allow for future modifications or capacity upgrades as needed with minimal investment



A well-thought-out scalability plan will reduce future CAPEX while delivering a higher level of customer satisfaction.

## Consider all technical requirements for “best-in-class” operations. Use both internal knowledge and new technology.

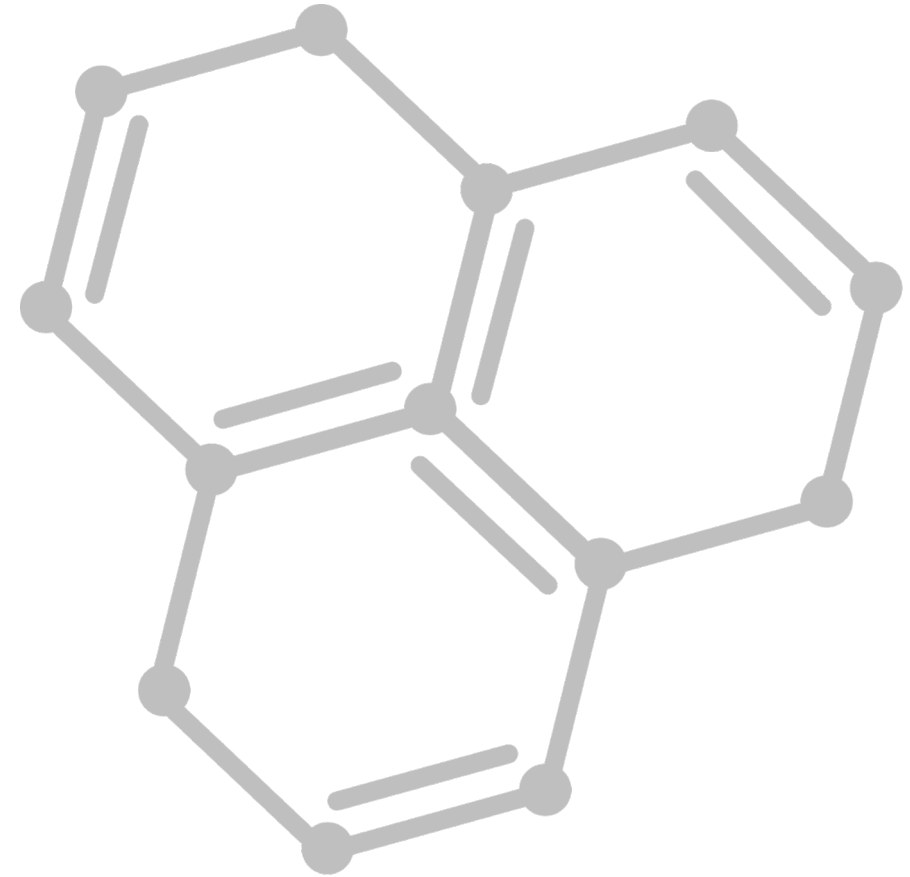
- Develop process models of existing operations for reaction, separation, and storage
- If increasing capacity, make sure you have kinetic and mass transfer data to model processing needs for new reactor capacity
- Ensure that adequate support equipment and utilities are considered
- Is the plant layout able to meet increased demand and have space to handle increases in inventory?
- Confirm sufficient milling capabilities
- Ensure sufficient or appropriate dispersion capabilities
- Explore the potential of in-process quality checks/monitoring



A well-planned and executed technical requirements review is critical to success.

## Consider all technical requirements for “best-in-class” operations. Use both internal knowledge and new technology... *continued*

- If hazardous materials are used:
  - Will an increase in capacity require improved ventilation?
  - Sprinkler systems for fire hazards
  - Inspection of facilities by state and local authorities
  - Changes in permitting
- If taking over an older facility, many process/safety and access issues were likely grandfathered in over the years. Grandfathering may no longer be valid, resulting in a need to:
  - Upgrade access points to current regulations
  - Inspect for asbestos
  - Upgrade locker areas and bathrooms, etc.



A “First Time Right” technical requirements review will increase the overall success.

## Not all growth and expansion comes from building or buying new assets—it may make sense to purchase a business or an existing facility with used assets.

Take a similar approach as buying or building something new, with just a few additions:

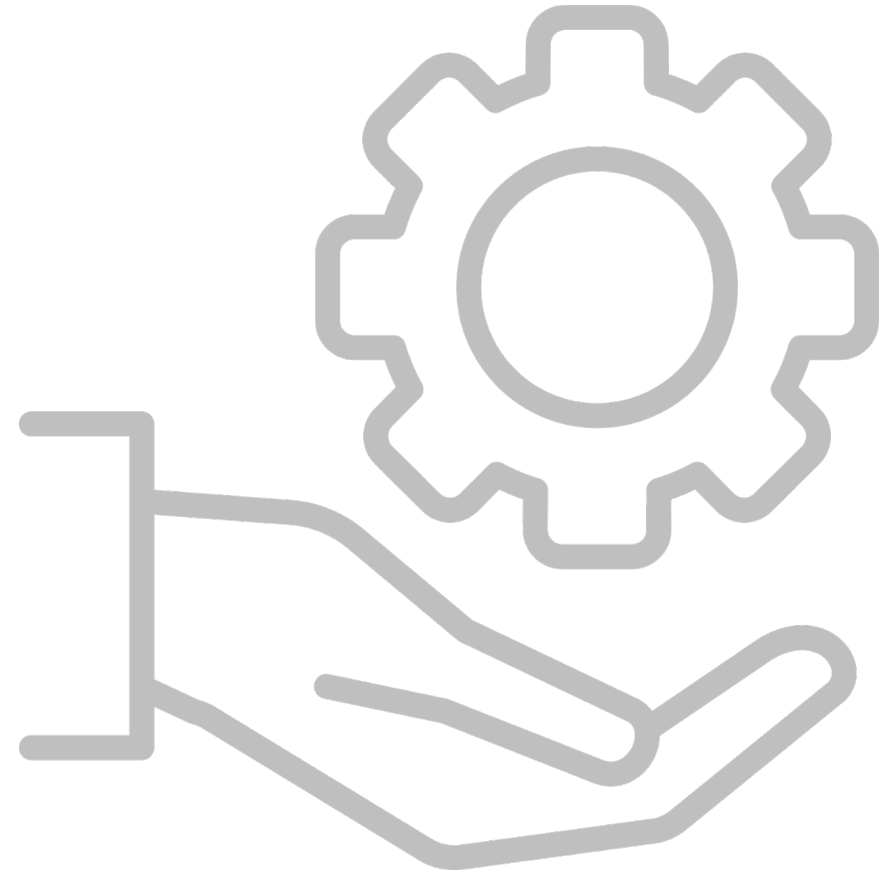
- Perform detailed due diligence on all properties, buildings, and assets
- Complete a full inspection, especially in the EH&S categories
- Do a financial evaluation on the property values and assets
  - In cooperation with your accounting group, develop a new depreciation schedule on the assets based in part on the purchase price
- As part of business transformation, ensure customers requiring changes are in agreement



It is important to analyze the added technology against existing assets and ensure it meets or exceeds the technology in place at existing sites, including standardization wherever possible.

## Divesting a business or facility is a similar process to acquiring or purchasing a facility—but from the alternate side.

- When selling a facility to potential buyer, it is important to be fully transparent regarding the information provided in the sale
- To avoid potential concerns, anticipate what the buyer's questions will be in advance
- Stay on schedule, meeting all deliverables to include open communications on project status
- Be approachable and on call as needed
- Ensure customer deliveries are not interrupted and an alternate plan is in place



Regardless of sale or shut-down, it is critical that there is open communication and full transparency.



Thank you!  
Questions? Feel free to reach out:

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