

AspenTech Strategic Planning for Sustainability Pathways™

Fast, Optimal Recommendations to Accelerate Your Path to Net-Zero

Developing a strategic plan to achieve net-zero goals for capital-intensive industries can be a complex and challenging exercise. AspenTech Strategic Planning for Sustainability Pathways assists teams in developing an effective, long-term decarbonization strategy through the screening of multiple technologies while optimizing the balance between financial objectives and net-zero targets. This solution enables efficient decision-making through scenario analysis, providing insights into the lifecycle assessment and taking into account both capital investments and operational costs.

Now refineries, gas plants, oil operations, power plants, cement plants and other industrial sites can identify the most optimum decarbonization strategy before considerable investment is made.

Key Benefits

Easily Develop Strategic Investment Plans to Achieve Net-Zero Goals

- Guide long-term sustainability investment decisions based on projected capital & operating costs and CO₂ footprint
- Evaluate multiple scenarios to select the most suitable pathway configuration to achieve your long-term plan

Balance Profitability and Emissions

- Maximize profits while minimizing CO₂ emissions
- Maximize CO₂ reduction by maintaining positive profits

Evaluate Impact of External Market Factors

- Account for price fluctuations, market demand, tax rates and carbon credits
- Assess effect of policy changes and new environmental regulations

Discover New Pathways with Generative AI

- Consider new and emerging technologies during evaluation
- Identify and build new CO₂ capture and conversion pathways

Key Capabilities

- Built-in and customizable templates for quick setup and evaluation of CCU pathways
- Flowsheet-based model built using Aspen Unified™ platform
- Simultaneous optimization between profitability and emissions-reduction objectives
- Embedded, best-in-class MINLP (Mix Integer Non-Linear Program) solver for robust optimization
- Built-in library of selected Scope 2 and Scope 3 emissions with adjustable system boundaries
- Use generative AI to discover and build new pathway structures
- Option to include CAPEX as part of the analysis
- Techno-economic analysis to aid with decision-making
- Rich visualization and analysis tools
- What-if scenario analysis with case management
- Role-based model access and collaborative functions

Use Case: Making Strategic Decisions on Carbon Capture and Utilization in a Refinery

CHALLENGE: As a part of its net-zero commitment, an oil & gas company is looking to reduce the carbon footprint within its refining operations.

Significant emissions are coming from a steam methane reforming (SMR) unit, and strategic planners want to evaluate the most effective alternatives for carbon capture and utilization. They are considering a number of technologies and product profiles, including gasoline, diesel, DME, methanol and acetic acid.

With uncertain external market factors such as geopolitics, policy changes and environmental regulations, the evaluation of technologies and pathways increases the need for a systematic approach to quickly consider these factors and support more strategic decisions.

SOLUTION: The AspenTech Strategic Planning for Sustainability Pathways provides planners with a tool to evaluate different technologies to capture the CO₂ from the SMR flue gases, as well as processes to convert the captured CO₂ into desired end products.

The solution helps the refinery staff select the best option to balance the investment and emission reduction through a systematic evaluation that includes emission calculations together with the CAPEX and OPEX investment for these processes. The emission calculations consider direct emissions, indirect emissions from energy use and emissions related to the carbon footprint of the feeds and products.

RESULT: The strategic planners at the refinery provide a recommendation to executives with the best pathway to fit the company's net-zero goals in a timely manner, quantifying the critical balance between investment and emission reduction.

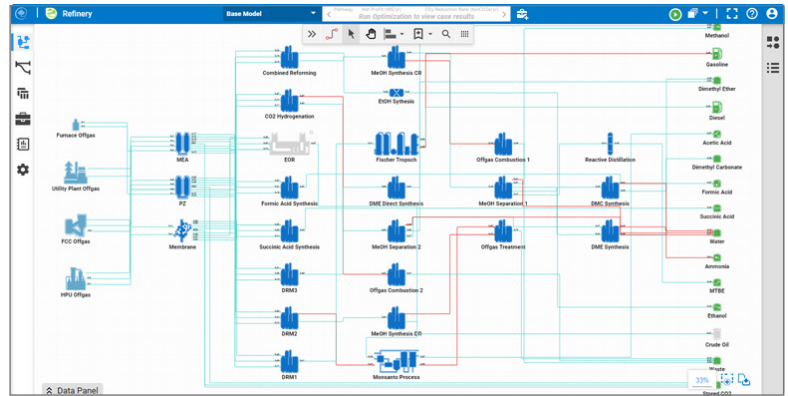


Figure 1. Example of superstructure with alternative carbon capture and utilization pathways.

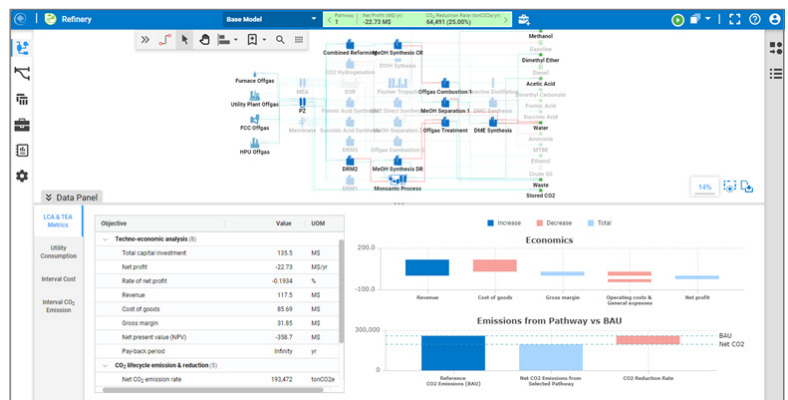


Figure 2. Economic and emission calculations for selected pathway.

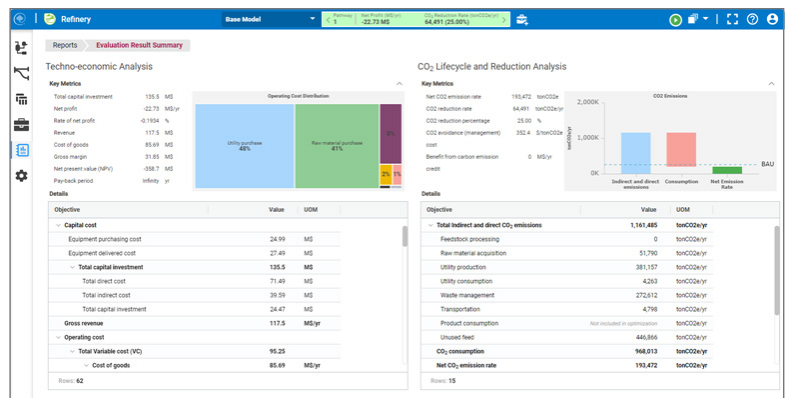


Figure 3. Summary of economic and emission KPIs.