



Stress-testing programs for energy companies

Tech powered for strategic planning and beyond

While new stress-testing solutions are helping energy companies extract more insight to better understand their exposures during extreme market events, there are still hurdles to overcome. The sophistication of a stress-testing program can often be limited by the availability of quantitative skills, reliability of data, and overall costs to maintain the program.

How can energy companies overcome these challenges? By having the right data, in-house resources, and systems in place, which are all necessary to perform the most beneficial stress-testing program—powered by top technological tools.

What is the value of stress testing in energy?

1. Stress testing is an important risk management tool and should play a role in an energy company's strategic planning.
2. In today's environment of changing regulations, volatile commodity prices, developing technologies, and extreme weather patterns, stress-testing programs help leadership understand the impact of extreme events on the organization's financial position.
3. Understanding the variables that drive stress allows management to develop a plan to mitigate these risks and absorb the associated impact.

Key benefits: Stress testing in energy

While the energy space is not subject to the same regulatory requirements as the financial services sector, banks' development of stress-testing regimes has demonstrated a number of benefits from incorporating a comprehensive stress-testing framework into risk management activities:

- The use of statistical forecasting models to assess **the behavior of new products under stressed scenarios** or assessing **the impact of new regulations** are just a couple of examples.
- **Capital planning** is another area that can benefit. Understanding how much capital might be needed to keep the business operating during an unexpected event can help improve capital.

- While stress testing can play an important role in measuring the financial impact from market and credit risk exposures, it can also support **the execution of corporate strategy**. Management can develop an understanding of how specific business decisions might impact capital, which then supports the development of contingency plans for adverse scenarios. With a prescribed set of actions, management can respond quickly during periods of distress.

Leveraging stress-testing across the industry

Stress testing is not just for energy companies with explicit trading exposures; utilities and pipeline companies can benefit as well. The growth of renewable energy generation in the West has put some utilities in a net long, natural-gas-and-power position exposed to market risk.

Pipeline companies engaged in park and loan services also need to understand the various risk factors and financial impacts of having to replace a short gas position because a borrower cannot return it.

Internal limitations do not have to be a deterrent to achieving benefits. As an example, one energy company chose to implement a more reliable and robust modeling automation solution for its stress-testing program. Elements such as variable selection and transformation, model building, performance testing, model selection, documentation, and model reruns were all automated. This resulted in less need for multiple resources to perform these functions, a faster and more frequent generation of results, and a consistent process.

Emerging simulation technologies

For energy organizations facing resource and technical challenges to implementing and maintaining a program, emerging technologies are helping to fill the gap. Economic simulation generation and process automation are lending a hand to provide more thorough analyses, allowing organizations to better plan and position their portfolios.

Specifically, organizations have leveraged technology to improve process efficiencies and driver faster analysis, decisions, and actions. For example, other organizations are using advanced technologies to create economic scenarios as inputs in their models. These simulators use advanced analytics such as dimension reduction, time-series analysis, regression methods, and simulation techniques, to generate a joint distribution of macroeconomic variables, to quantify key measures in risk management, as well as to contribute towards capital planning.

These simulators are able to forecast a large universe of macro variables simultaneously, preserving the dynamics of individual variables and interdependence structure among them. They also have the flexibility to incorporate expert judgment. For instance, the variable universe can be expanded, or the definition of scenario severity and the criteria used in path selection can be customized.

In addition, these simulators are often enhanced with parallel processing features, the ability to run locally or in cloud-based platforms, improving computing efficiency and scalability. They also are typically equipped with user interfaces to facilitate user-defined criteria.

How KPMG can help

KPMG can help companies incorporate technology into their stress-testing tools to help achieve productivity gains, data-error reductions, and reduced manual interference within the modeling framework.

We can also help our clients establish process automation points to streamline the design, build, test, and deployment processes. Beyond process efficiencies, KPMG can help clients develop a more comprehensive set of macroeconomic variables on which to assess the business function's ability to withstand potentially catastrophic events.

Further, our experience in model building, model validation, and model governance can help our clients throughout the entirety of their stress-testing model life cycle.

Energy companies that understand where risk exists within operations, and how they respond to exogenous variables, can impact business decisions and preemptively allow businesses to plan and position themselves appropriately.

Our practice

KPMG's Market & Treasury Risk practice can effectively support nonfinancial institutions in the processes of identification, measurement, management, and mitigation of market risks. The wide range of our Market & Treasury Risk services encompasses several topics such as financial risk management, capital markets operations, treasury and liquidity management, asset and liability management, financial products evaluation, energy management, and commodity risk. On these topics, KPMG is able to offer a full range of services with an "end-to-end" approach: risk strategy, models and methodologies, policies and processes, operating models and architectures, and software solutions.

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