Business challenge

Wanting to improve its modeling efforts, Prayas (Energy Group) (PEG) was looking for a new optimization platform that could better meet speed and complexity challenges.

Transformation

With help from IBM Business Partner Cresco International, PEG transitioned to a modeling platform based on IBM® ILOG® CPLEX® Optimization Studio software. The organization can now introduce more variables into its simulations and test them more frequently, yielding richer research data to craft policy recommendations for the energy sector.

Results

30–40% faster processing times
enabling more simulations in a shorter period

Advances research efforts
by supporting more complex modeling processes

Improves policy discourse
with more robust analytics

Prayas (Energy Group)

Assisting decision-making in the energy sector with more complex modeling

Based in Pune, India, PEG is a not-for-profit research and policy advocacy group focused on making reliable, affordable and sustainable energy available to everyone. The organization is part of the larger Prayas Group and was founded in the early 1990s.

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—Srihari Dukkipati, Research Fellow, Prayas (Energy Group)

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No easy answers

Usable analytics is the key to any successful, well-thought-out policy. And to produce the research that drives some of its policy recommendations, PEG relies heavily on complicated computer models to evaluate the techno-economic efficiency and socio-environmental impact of decisions related to energy infrastructure.

"For example," adds Srihari Dukkipati, Research Fellow at PEG, "we might use a model to simulate the electricity grid operation to gain insight into short-to medium-term planning issues in the power sector. Or we have a model that looks at the interactions between the energy sector and the rest of the economy."

For the short-to medium-term simulations, PEG projects a one-year timeframe, running several iterations to account for uncertainty in different variables. However, the firm also runs more complex models, often projecting more than a decade into the future to analyze the potential long-term impact of different strategies or policy decisions.

Unfortunately, the organization's existing modeling software was beginning to show signs of strain.

"We were finding it difficult to solve more complex models," explains Dukkipati. "We were running some models that were computationally

difficult and would take several days to finish. Or sometimes it wouldn't complete. That didn't work for us."

To strengthen its research efforts and ideally enable the exploration of more complex policy questions, PEG began looking for a new optimization program.

Running the numbers

As it explored options, PEG came into contact with IBM and IBM Business Partner Cresco.

"When we heard that PEG was looking for new software," adds Hemangi Dholakia, Vice-President of Sales at Cresco (India), "we really got excited. The work they are doing

is phenomenal, and we wanted to be aligned with them. We helped them evaluate their software options, and we tried to give them as much information as possible to help them make the right choice."

After considering a handful of applications, PEG chose to shift its modeling activities to the ILOG CPLEX Optimization Studio platform. The IBM software offers a comprehensive set of tools that allows the firm to run more complex simulations.

"One model we were struggling with before," recalls Dukkipati, "was a capacity expansion model that looked 15 years down the line to estimate optimal capacity addition strategies. It had to factor in various cost trajectories—coal, wind, solar.

And the model was designed to determine the optimal capacities. Obviously, there are a lot of uncertainties for each of these cost trajectories, but CPLEX showed promise in performing better during our evaluation tests."

A projected winner

With the IBM software in place, PEG could accelerate its modeling efforts.

"Our solution times are down by about 30–40 percent compared to what we were using before," explains Dukkipati. "So if we were able to do two runs of a model overnight, now we can do 3–4 runs of that model. We can use that time for other things—modeling is only one of many kinds of analyses we do to inform our policy work."

Beyond this time savings, the new solution also helps PEG explore more complex models. "It allows us to do a much more thorough and rigorous analysis of whatever

question we are trying to answer." continues Dukkipati. "We can do more experiments to gain various insights—to see how the system behaves under changing inputs."

This research, in turn, will hopefully lead to more reliable and equitable energy policies. Or as Dukkipati explains it, "We need robust analysis to present to policymakers and regulators so that we can suggest policies and regulations that work better for the disadvantaged portions of the population and keep them from being neglected."

Finally, PEG was thoroughly pleased with its choice of IBM and Cresco. "CPLEX worked right out of the box," adds Dukkipati. "There was no downtime in terms of what we were doing. And it was also important for us that if we had any issues with the software, we needed good support. After talking to IBM and Cresco, we were confident that Cresco had the expertise necessary to help us if we needed technical support to customize the solver setup."

Sanjeev Datta, Principal at Cresco, sums up the engagement, adding: "When working with clients, our objective is to assist with the right skills and technology. Here we did just that. Our ability to identify the challenge, prescribe the right technology and provide operational support is what makes Cresco a value-added IBM reseller. And that is our motto with all of our clients."

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Solution component
- IBM® ILOG® CPLEX® Optimization Studio

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