

## Dakota Gas, USA

### Efficiency & Cost Reduction Project



The Dakota Gasification Company started in 1984 in North Dakota, USA with the Great Plains Synfuels Plant. The plant uses lignite coal to make synthetic natural gas. The synthetic natural gas is piped to the Northern Border Pipeline which supplies homes and businesses in the eastern part of the United States.

“While the value achieved during this highly successful process is enough to strongly recommend the Renoir team, it is the gains that are being developed through the processes established that continue to add value after Renoir that is most exciting.”

**Gary G. Loop,**  
*Sr. Vice President & COO*

#### Key Results

Leadership competency levels  
from 35% to 77%

Projected PMO savings of  
\$46.5 million

Undocumented charges  
were reduced by 25% and  
unapproved non-scope  
charges have a target  
reduction of 60%

#### ANALYSIS

DGC recognized that the price of synthetic natural gas (SNG) could not exceed \$5 per dekatherm if the plant was to remain competitive. With this in mind they commissioned Renoir to assess their energy consumption and production processes to identify & quantify opportunities to reduce costs.

The detailed study revealed a number of areas for improvement:

- Energy consumption in the form of steam and electricity could be reduced significantly.
- SNG production could be more consistent and at higher rates.
- Co-product recovery could be at a higher rate.
- Maintenance efficiency could be significantly improved.
- Improved coordination between Operations and Maintenance efforts.
- Improved coordination between marketing and the plant.

#### PROJECT APPROACH

The Efficiency Improvement Project consisted of two phases, each of 35 calendar weeks, designed to deliver two implemented objectives:

- A significant change in DGC employees' and management's awareness of the business drivers (cost and profitability) and decision making processes necessary to achieve the \$5/dekatherm goal.
- A targeted \$13.5 million in sustainable savings annually.

The Project Team consisted of a dedicated Renoir Project Team along with a DGC Task Force of 5 people allocated full time to the project. A Steering Group consisting of the Senior Plant Management was formed to drive the project; 6 Management Action Teams (MATs) were created of people from DGC and Renoir consultants. The MATs' focus was to generate ideas for improvements, evaluate these ideas for suitability and economic viability, and drive the installation of the approved ideas. Both the Task force and the MAT members received extensive training and continuous development throughout the project to prepare them to become key change agents for the organization.

During the first weeks of the project, the teams revisited the areas identified for improvement during the assessment, thus ensuring buy-in and ownership of the improvements. New ideas were also generated and examined by each MAT. Each MAT's activities were planned and scheduled.

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## THE RENOIR GROUP

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**Operations:** The Operations MAT concentrated their efforts on improving throughput by eliminating constraints. This was achieved by introducing an Operating System which consisted of daily, weekly and monthly targets, manual monitoring systems and actionable variance reports. Each element of this Operating System was designed and introduced using a consultative process which ensured ownership and sustainability.

**Energy:** The Energy MAT focused on generating ideas for reducing energy consumption across the plant which were evaluated for viability and scored according to the investment required to implement them. The approved ideas were then implemented and monitored to evaluate the results achieved. The reduction in overall electricity consumption greatly exceeded initial expectations and are sustainable. The ideas scoring and evaluation systems have been adopted by DGC as their accepted methodology for all energy saving ideas.

**Maintenance:** Improvements in Maintenance were achieved through detailed research of each Maintenance requirement and then determining the most effective resource to carry it out. Often this meant moving it away from Maintenance into Operations. This streamlined maintenance planning and greatly reduced times to achieve standard non-skilled tasks, enabling maintenance staff more time to carry out work currently being done by contractors. The Maintenance MAT, using new systems, tracked, measured and evaluated volume and value of transferred work against the amount of reduction in the contracted services.

**Training:** Early in the project the Training MAT completed a Training Needs Analysis (TNA) to identify deficiencies and gaps in the training and development of the managerial staff. A key learning was the revelation that they excelled at reacting to events rather than anticipating and preventing them. Renoir developed a tailored Management Training Program, addressing this and other issues identified and throughout the project, over 200 people were trained.

**Evaluations:** An Evaluations MAT established an historical base against which all improvements were measured to show exact financial benefits. This transparent approach convinced the most hardened skeptics that the benefits were "real" and provable. The Evaluations process also gave a "hard" edge and a consistent and accurate methodology so that all projects could be correctly evaluated.

**Weekly Steering Group Meetings:** were held to ensure that the project remained on track and achieved the stated objectives in accordance with the detailed Project plan published at the outset, and all changes and system elements involved the stakeholders to ensure a high level of ownership and sustainability that led to a controlled culture change.

**Facility Planning:** A Facility Plan was constructed and systems installed to maintain it which brought the plant and marketing together and also extended control to all the departments. It created a common goal and road map of how the goal was to be attained.

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