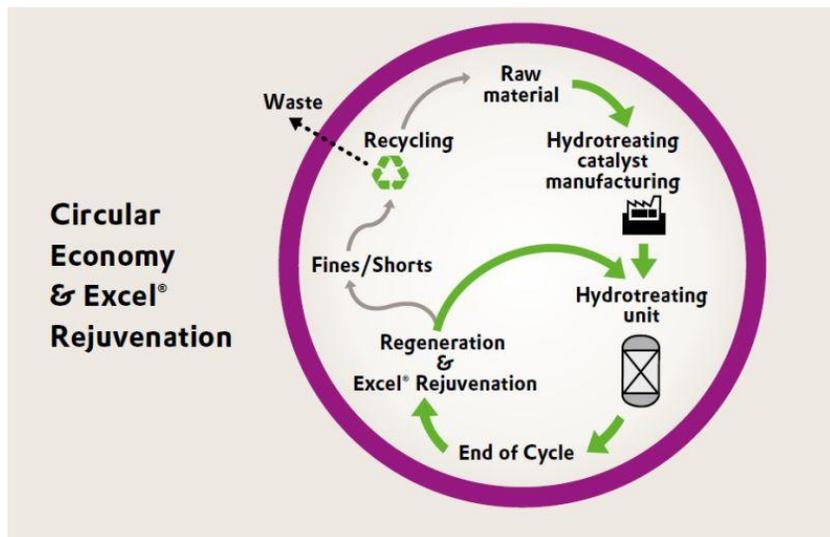


Excel® Rejuvenation technology helps businesses to minimize environmental impact and reduce waste

Sustainability has become an increasingly important part of any business strategy, and given that the chemical industry plays such a significant role in so much of modern life, it can be difficult to deny its contribution to emissions.

Refiners face a balancing act to produce marketable products and maintain competitiveness, while complying with increasingly stringent environmental regulations, external pressures and soaring energy costs.

The challenge is to find economically efficient and sustainable operation methods, without compromising performance or safety.



Which is where Evonik’s Excel® rejuvenated catalyst has come to the rescue, bringing significant sustainability, performance and cost benefits when used in an ultra-low sulfur diesel (ULSD) unit in Europe.

The challenge

A European ULSD unit processing a complex blend of light gas oil (LGO), vacuum gas oil (VGO),

coker distillate under high pressure (72 barg) and severe liquid hourly space velocity (LHSV), faced long lead times and high costs associated with fresh catalyst loads. The business sought a more sustainable and cost-effective alternative without compromising performance or disrupting operations.

*S&P Global, 2022 ** Statista, 2024

Evonik Catalysts' solution

Evonik provided a full reactor solution using its Excel® rejuvenated high-activity NiMo catalyst from its inventory, supported by proprietary CatGuard top bed grading and DUROCEL® bed supports. This approach enabled the unit to switch from fresh to rejuvenated catalysts, using collaborative expertise in catalyst and process technologies.

Our results

Thanks to Excel® rejuvenated catalysts, the company was able to achieve performance parity with previous fresh catalyst cycles and reduce their operational costs with shorter lead times.

Figure 1 shows how Excel® rejuvenated catalysts brought significant sustainability, performance and cost benefits. From an environmental perspective, the ULSD unit achieved lower Scope 3 emissions, supporting its sustainability goals and minimizing its environmental impact by diverting spent catalysts from landfill.

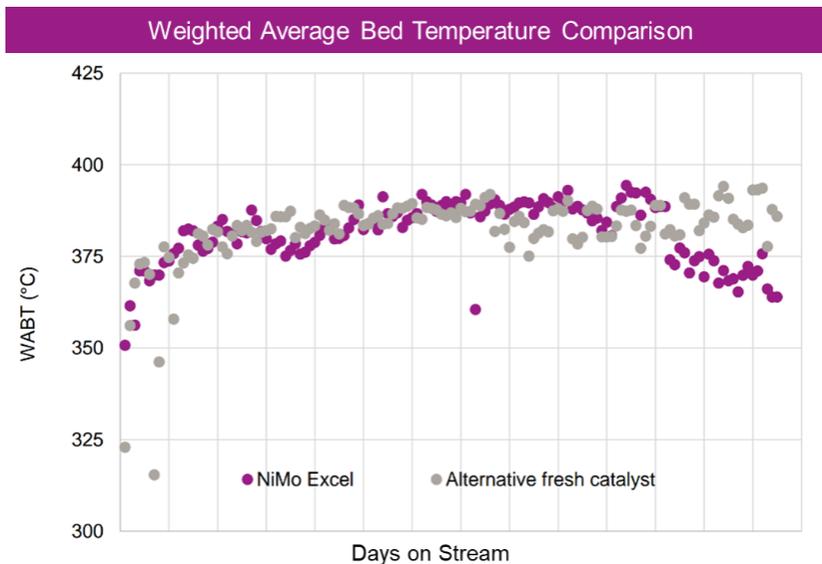


Figure 1: The Excel® rejuvenated catalysts performed equivalently to the fresh catalyst from the previous cycle.

Excel® rejuvenated catalyst delivers performance and sustainability in North American hydrotreater

A North American refinery operating a low-pressure distillate hydrotreater (35 barg) with high LHSV was looking for a catalyst solution that would maintain performance, while reducing costs and environmental impact.

The challenge

The refinery required a catalyst that aligned with its sustainability and operational goals, supporting the production of a blend of distillate cuts to create ULSD and jet fuel.

Evonik Catalysts solution

To answer the call, Evonik supplied an Excel® rejuvenated CoMo catalyst from its inventory, tailored to meet the

refinery's technical projections.
 A full reactor solution was provided, ensuring seamless integration and optimized performance under demanding conditions.

As Figure 2 shows, Excel® rejuvenated catalysts provided excellent stability and a low deactivation rate over the course of the cycle, meeting expectations with equivalent performance to the previous cycle.

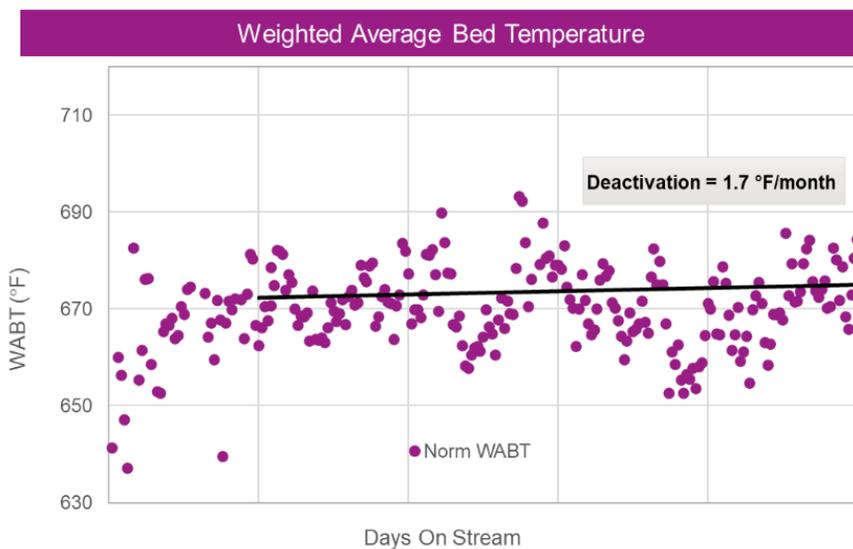


Figure 2: Demonstrated stable performance and low deactivation from the Excel® rejuvenated catalyst.

Our results

Thanks to the Excel® rejuvenated CoMo catalyst, the refinery was able to achieve stable performance and a low deactivation rate throughout the cycle. It was also able to lower its Scope 3 emissions by supporting its carbon reduction targets, while reducing waste and minimizing landfill impact through the reuse of catalyst materials – showcasing how rejuvenated catalysts can meet performance standards while being cost-efficient and sustainable.

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Excel® rejuvenated catalysts match fresh catalyst performance in most hydro-treating units

60% ↓

lower CO₂eq/kg GWP emissions vs. fresh catalysts

70%

savings when catalysts are reused internally

Life Cycle Assessment

Additionally, externally certified Life Cycle Assessments provide avoided emissions calculations. In the instance of Excel[®] rejuvenated catalysts, it has been found that their use results in a 60% reduction in CO₂eq/per kg of catalyst global warming potential (GWP) emissions, when compared to fresh catalysts.

It is also important to note the cost savings Excel[®] rejuvenation technology

presents: between 30-50% when purchased directly from Evonik's inventory and up to 50-70% savings when refining organisations reuse catalysts within their own systems.

A comprehensive solution for companies aiming to optimize performance, Excel[®] rejuvenation technology allows for a greener, more circular approach to catalyst management.

To discover more about how Evonik Catalysts is driving a broad green agenda, click [here](#).

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