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ExxonMobil and Renewable Energy Group Partner with Clariant to Advance Cellulosic Biofuel Research

- Partnership to expand on joint ExxonMobil and REG research into cellulosic biodiesel
- Clariant's sunliquid® technology to facilitate creation of compatible cellulosic sugars
- Objective is to combine technologies into a single, integrated biodiesel production process

IRVING, Texas & AMES, Iowa & MUTTENZ, Switzerland--(BUSINESS WIRE)-- [ExxonMobil](#) and Renewable Energy Group (REG) said today that they have signed a joint research agreement with Clariant to evaluate the potential use of cellulosic sugars from sources such as agricultural waste and residues to produce biofuel, which has the potential to play a role in reducing greenhouse gas emissions.

This press release features multimedia. View the full release here:
<https://www.businesswire.com/news/home/20190122005781/en/>

The new partnership expands a previously announced agreement for joint research between ExxonMobil and REG, in which the companies [successfully validated the ability of REG Life Sciences bio-conversion technology to convert sugars from cellulosic biomass into biodiesel](#) through a single-step process.

The new agreement with Clariant allows ExxonMobil and REG to further optimize REG's bio-conversion process using previously tested and benchmarked cellulosic sugars created through Clariant's sunliquid® process. The companies' ultimate objective is to combine Clariant's and REG's processes into a seamless cellulosic biomass-to-biodiesel technology.

"Over the past three years, our work with REG has led to important advances in genetically improving REG's proprietary microbes for a beneficial use in facilitating the conversion of cellulosic sugars into biodiesel," said Vijay Swarup, vice president of research and development at ExxonMobil Research and Engineering Company. "Applying Clariant's expertise and knowledge will help us better understand and advance a key stage in the overall cellulosic conversion process, and hopefully lead to the development of scalable biodiesel technology."

Clariant is a leading company offering integrated technologies and solutions for converting agricultural residues such as wheat straw, rice straw, corn stover and sugar cane bagasse. Clariant's sunliquid® process features chemical-free pretreatment, the integrated production of feedstock and process-specific enzymes and thus high yields of fermentable C5 and C6 sugars. Clariant will conduct trials at its pre-commercial plant in Straubing, Germany using different types of cellulosic feedstock that will be converted into sugars for conversion by

REG and ExxonMobil into high-quality, low-carbon biodiesel.

“We are committed to innovation and R&D, together with a focus on sustainability, as main pillars of Clariant’s strategy,” said Christian Kohlpaintner, member of Clariant’s executive committee. “Our sunliquid® technology platform is a key outcome of this commitment. We are proud that two strong allies in the biofuels industry have selected Clariant as their partner and are excited to work with them on further leveraging this unique technology for converting cellulosic biomass to fuels and chemicals, including biodiesel.”

REG Life Sciences technology has proven its broad applicability to industries as diverse as flavor and fragrance, specialty chemicals and transportation fuels. Through its partnership with ExxonMobil, REG has developed proprietary technology that utilizes industrial microbes to convert complex cellulosic sugars into low-carbon biodiesel in a one-step fermentation process.

“ExxonMobil has been an exceptional partner in developing this promising technology,” said Eric Bowen, vice president of REG Life Sciences. “We are delighted to be able to add Clariant to the team with its market leading sunliquid® technology. We believe we have assembled a dream team for conversion of cellulosic biomass to low carbon biofuels and are excited about the promise of this collaboration.”

The partners will also work on a conceptual engineering study to validate the feasibility of the integrated process comprising the technologies of all parties.

About ExxonMobil

ExxonMobil, the largest publicly traded international oil and gas company, uses technology and innovation to help meet the world’s growing energy needs. ExxonMobil holds an industry-leading inventory of resources, is one of the largest refiners and marketers of petroleum products, and its chemical company is one of the largest in the world. For more information, visit www.exxonmobil.com or follow us on Twitter at www.twitter.com/exxonmobil.

Cautionary Statement: Statements of future events or conditions in this release are forward-looking statements. Actual future results, including project plans and timing and the impact and results of new technologies, including efficiency gains and emission reductions, could vary depending on the outcome of further research and testing; the development and competitiveness of alternative technologies; the ability to scale pilot projects on a cost-effective basis; political and regulatory developments; and other factors discussed in this release and under the heading “Factors Affecting Future Results” on the Investors page of ExxonMobil’s website at exxonmobil.com and uncertainties described in REG’s annual report on Form 10-K for the year ended December 31, 2017 and other reports subsequently filed with the SEC.

About Renewable Energy Group

Renewable Energy Group, Inc. (Nasdaq: REGI) is a leading provider of cleaner, lower carbon intensity products and services. We are an international producer of biomass-based diesel, a developer of renewable chemicals and North America’s largest producer of advanced biofuel. REG utilizes an integrated procurement, distribution, and logistics network

to convert natural fats, oils, greases and sugars into lower carbon intensity products. With 14 active biorefineries, a feedstock processing facility, research and development capabilities and a diverse and growing intellectual property portfolio, REG is committed to being a long-term leader in bio-based fuel and chemicals.

About Clariant

Clariant is a globally leading specialty chemicals company, based in Muttenz near Basel/Switzerland. On 31 December 2017 the company employed a total workforce of 18 135. In the financial year 2017, Clariant recorded sales of CHF 6.377 billion for its continuing businesses. The company reports in four business areas: Care Chemicals, Catalysis, Natural Resources, and Plastics & Coatings. Clariant's corporate strategy is based on five pillars: focus on innovation and R&D, add value with sustainability, reposition portfolio, intensify growth, and increase profitability. For more information, visit www.clariant.com.

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