E&P companies work to get ahead of GHG standards

The "greening" of the petroleum industry is accelerating now as oil and gas companies showcase their plans to reduce greenhouse gases (GHGs).

In that vein, Ryder Scott presented a two-hour webinar May 11. The participants presented industry efforts to cut upstream emissions, manage data on sustainability and independently validate renewable energy processes.

Julie Mulkerin

Julie Mulkerin, general manager - energy transitions strategy at Chevron Corp., kicked off the webinar with the company's "market-based approach" for decreasing emissions and increasing returns.

Chevron aims to reduce upstream CO_2 emissions intensity by 40 percent for oil and 26 percent for gas under a 2016-to-2028 schedule. The company also plans to reduce the much more harmful GHG, methane, by 53 percent under that schedule. Chevron plans to lower emissions from flaring by 66 percent, said Mulkerin.

The company said it has invested $1 billion in carbon capture, utilization and storage (CCUS).

Carbon pricing is the primary policy tool for Chevron to achieve GHG emission reduction goals while increasing returns. There are two main types of carbon pricing: emissions trading systems (ETS) and carbon taxes. An ETS – sometimes referred to as a cap-and-trade system – caps the total level of greenhouse gas emissions and allows those industries with low emissions to sell their extra allowances to larger emitters.

"Establishing a High Quality Sustainability Data Management Program," was presented by **Adrian Wain**, carbon advisory & solutions lead at Underwriters Laboratories (UL).

Consumers universally are familiar with the UL logo and fine print inconspicuously etched on the back of electrical products, stating that the device meets safety standards.

"Underwriters Laboratory has 120 years of experience testing and inspecting products for safety," said Wain. "We don't have the same recognition for ensuring safety through a stable climate, removal of toxic substances and other activities."

UL-inspected products are used at oil and gas drilling sites, refineries and on- and offshore facilities. The company tests and certifies sustainability of products and services. UL also furnishes software platforms that help companies track and measure environmental, health and safety (EHS) management and sustainability data.

"The cost of capital is based on sustainability measures," said Wain. "Companies that do not conform to sustainability-related metrics and standards may not be able to do business with potential partners."

He also pointed out that companies that report poor results in sustainability performance management run the risk of being sold off.

UL has restructured, so the advisory services unit, which handles decarbonization and renewables, is separate from certification services. Ryder Scott and UL plan to assist oil and gas companies and collaborate to validate and verify emissions targets and the diversification of energy resources, said **Dean Rietz**, CEO at Ryder Scott.

Herman G. Acuña, executive vice president at Ryder Scott, presented "Third-Party Validation and Verification Process," which summarized the firm's GHG management services and renewable energy consulting services.

Herman G. Acuña

"GHG is not a fad. A GHG statement is a factual, objective declaration made by the responsible party," he said. "The company should be capable of consistent measurements against suitable criteria by a validator or verifier."

Acuña drew a distinction between validation and verification. Validation involves the evaluation of the reasonableness of assumptions, limitations and methods that support the statement on future outcomes. Verification is evaluating a statement of historical information to determine if it is materially correct and conforms to criteria.

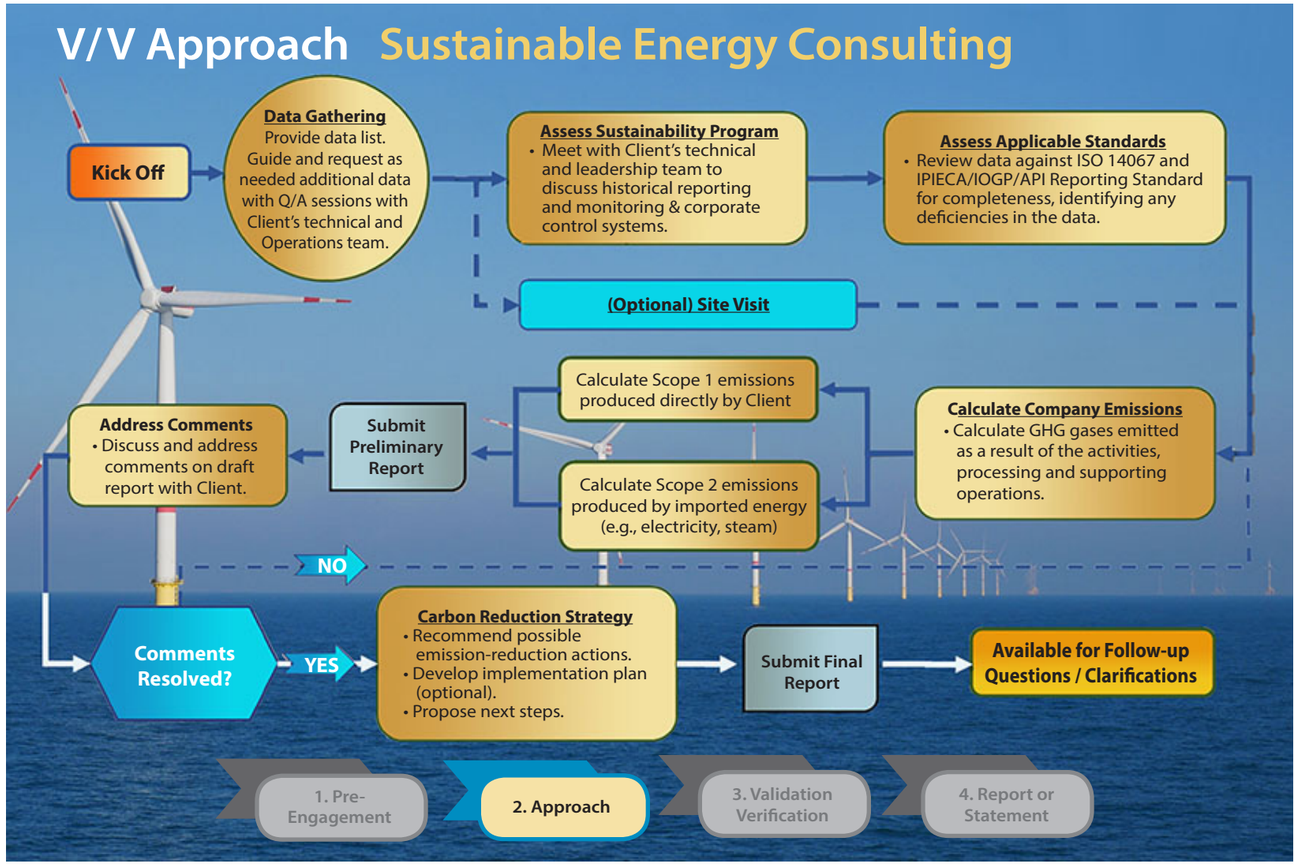
Acuña showed a flow chart (next page) of the validation and verification (V&V) approach, starting with data gathering and ending with submission of the final report and follow-up questions and clarifications.

"Ryder Scott provides added assurance that GHG forward-looking statements are consistent with activities associated with reserves and resources disclosed to the public and financial markets," said Acuña.

Ryder Scott estimates GHG emissions through direct measurement, stoichiometric calculations and emission factors and follows guidelines of the International Petroleum Industry Environmental Conservation Association, International Association of Oil & Gas Producers and American Petroleum Institute.

V&V engagements vary in scale and scope. Establishment of the evaluation boundaries and inventories is key to the success of the evaluation.

For more information, contact Acuña at herman_acuna@ryderscott.com or **Sandeep Khurana**, head advisor–integrated services, at sandeep_khurana@ryderscott.com.



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Petty, et al., state that water at 450º C has four times the energy density of water at 200º C while the energy conversion efficiency is 2.5 times that of ORC. Energy density is the amount of energy stored in a given system or region of space per unit volume. Energy conversion efficiency is the ratio between the useful output of an energy conversion machine and the input, in energy terms.

"While the U.S. DOE is focused on EGS at lower temperatures, the international geothermal community understands the economic value of producing supercritical fluid," stated Petty, et al.

No looking back

SPE is co-sponsoring the second part of a high-temperature well cementing workshop Oct. 7 to 9 in San Diego.

The event will be an opportunity for the petroleum and geothermal industries to share knowledge on the latest technical innovations, advancements, and best practices.

In addition to well completions events, SPE has presented the drilling side at the SPE/GRC (Geothermal Resources Council) Workshop, "High-Temperature and Corrosion in Drilling and Production - Exploring Geothermal and Oil and Gas Synergies," in March 2017.

The new name of the GRC professional association is Geothermal Rising.

If the pundits are right, the upstream industry will have to embrace change to survive long term. Undoubtedly, geothermal fills in all the blanks for the petroleum industry and its future. Crossover potential includes leveraging oil and gas technology developed over more than 75 years to scale up geothermal development.