Entropy Inc. Announces Initial Results of CETRI Technology Development Program and Executive Team Appointment

(TSX: AAV)

CALGARY, AB, July 27, 2021 /CNW/ - Entropy Inc. ("Entropy" or the "Corporation", a subsidiary of Advantage Energy Ltd. or "Advantage") is pleased to announce initial results from its technology development program at the University of Regina's Clean Energy Technologies Research Institute ("CETRI") and the appointment of Jason Chadwick to Entropy's executive team.

Technology Development Update

Extended testing conducted at CETRI's world-class research facility has confirmed Entropy's proprietary carbon capture solvent (named "Entropy23^{TM}") possesses high-performance characteristics that significantly exceed industry standards. The recently completed phase 1 of CETRI's extended protocol was conducted using a gas mixture with 4% CO_2 concentration in order to optimize the solvent blend for common post-combustion carbon capture applications including natural gas-fired turbines, reciprocating engines and boilers.

Prior CETRI research over the last 5 years that led to the discovery and formulation of Entropy23^{TM} was conducted using more traditional testing concentrations of 15%. Together, the data sets demonstrate the broad applicability of Entropy23^{TM} across a wide range of post-combustion carbon capture applications.

The process of scrubbing carbon dioxide from a mixture of gases is inherently energy intensive. CETRI confirmed (using a simple screening method at 4% CO_2 concentration) that monoethanolamine ("MEA", the industry standard carbon capture solvent) requires 12.15 GJ/tonne for the primary CO_2 capture and regeneration process in the laboratory. Entropy23^{TM} requires 3.15 GJ/tonne for the same process, a step change reduction of 74%. These physical properties directly impact the energy inputs required to capture carbon dioxide from a flue-gas stream, and the costs of requisite equipment.

Highlights of the Entropy23^{TM} phase 1 extended testing include:

- Heat duty is ~3.85 times lower than MEA, indicating a major reduction in energy input costs and operating costs
- Initial absorption rate is 66% higher than MEA, indicating the potential to reduce equipment size and cost
- Initial desorption rate is ~3.85 times that of MEA, indicating the potential to reduce equipment size and cost
- Cyclic capacity is 85% higher than MEA, indicating the ability to reduce the volume of solvent, equipment size and cost
- Lean loading at 110^{o}C is approximately 0, achieving nearly complete release of captured CO_2 at lower relative temperatures, which is expected to further reduce energy requirements
- Significantly lower NH_3 emission rates than MEA, indicating high stability and lower solvent degradation, which is expected to reduce operating costs

CETRI has now proceeded to phase 2 of the technology development protocol, which will include extended testing of Entropy23^{TM} using specific exhaust streams that match industrial emissions over multiple months, to confirm the enhanced degradation characteristics. The results of this phase are expected to be complete in early 2022, with regular progress updates throughout. The final phase of testing will be conducted beginning in Q2 2022 at Entropy's first commercial Modular Carbon Capture and Storage ("MCCS") development at the Advantage Glacier Gas Plant, allowing Entropy to produce in-situ, verifiable costs and energy intensity metrics for commercial applications by mid-2022.

When combined with Entropy's patent pending MCCS process, Entropy expects Entropy23^{TM} to be an important technology in the global effort to decarbonize. Entropy intends to pursue a dual path business model, with some projects to be developed as owner/operator/carbon manager, and other projects to be developed as technology provider/licenser with associated carbon royalties.

Executive Team Appointment

Jason Chadwick has been appointed Vice President of Business Development of Entropy, responsible for developing relationships with third-party emitters and developing the commercial agreements and structures required to navigate the full spectrum of the complex carbon capture business. Jason has 25 years of experience in Western Canada's upstream energy industry. Jason's prior experience includes serving as a Senior Vice President, Commercial for Modern Resources, a private E&P company recognized for its industry leading methane abatement and other low emissions technologies, where he was responsible for all corporate commercial and business development functions.

Ongoing Project Development

Scoping design, engineering, and subsurface evaluations are underway for each of the four projects under Memoranda of Understanding ("MOUs" announced June 2, 2021), with varying degrees of advancement. These MOUs, totaling approximately 1 million tonnes per annum ("TPA") under development, are in addition to the previously announced project at the Advantage Glacier Gas Plant (182,000 TPA in two phases), where all major equipment required for phase 1 has been purchased and preparations for construction are underway.

Entropy continues to engage with numerous other third-party emitters in a variety of industrial sectors and commercial applications such as power generation, cement production and gas compression, with a significant pipeline of additional potential projects under development.

Entropy is committed to commercial deployment of state-of-the-art technologies in carbon capture and storage ("CCS") and in other clean energy opportunities, building on the combined strengths of Advantage, Allardyce Bower Consulting Inc. ("ABC") and our advisors from CETRI.

About Entropy Inc:
Entropy is a privately-owned company (Advantage 90% and ABC 10%), founded to apply sophisticated science and engineering to commercialize CCS. Entropy's technology is expected to deliver commercial profitability at a carbon price below CAN$50/tonne, using proprietary MCCS technology. Entropy intends to deploy this technology in the global effort to reduce and eventually eliminate carbon emissions.

About Advantage Energy Ltd.:
Advantage is a low-carbon energy producer focused on developing its high quality Montney resources. Advantage's owned infrastructure, top-tier cost structure and capital efficiency provide a strong foundation for sustainable, disciplined production growth. With modern, low emissions-intensity assets and the Glacier CCS asset, Advantage continues to proudly deliver clean, reliable and sustainable energy, contributing to a reduction in global emissions by displacing high-carbon fuels. Advantage's common shares trade on the Toronto Stock Exchange under the symbol AAV with its head office in Calgary, Alberta, Canada.

About Allardyce Bower Consulting Inc.:
ABC is a Calgary-based engineering, procurement and construction management company with leading expertise in several aspects of gas processing and modularization. ABC's principals Brent Allardyce and Rick Bower provide over 75 years of related experience in designing, troubleshooting, and operating gas processing facilities with innovative professional services and unique capabilities.

About Clean Energy Technologies Research Institute (CETRI):
CETRI centralizes all low-carbon and carbon-free clean energy research activities at the University of Regina. Areas of research focus include decarbonization and zero-emission hydrogen technologies, carbon capture and utilization, and waste-to-renewable fuels and chemicals. Bringing together one of the most dynamic teams of researchers, industry leaders, innovators, and educators in the energy field, CETRI's mission aligns with the Environment & Climate Action areas of focus in the University of Regina's Strategic Plan.

Advisory

The information in this press release contains certain forward-looking statements, including within the meaning of applicable securities laws. These statements relate to future events or our future intentions or performance. All statements other than statements of historical fact may be forward-looking statements. Forward-looking statements are often, but not always, identified by the use of words such as "anticipate", "continue", "demonstrate", "expect", "may", "can", "will", "believe", "would" and similar expressions and include statements relating to, among other things, Entropy23™'s ability to impact the energy inputs required to capture carbon dioxide from a flue-gas stream and the required costs of equipment; anticipated timing of the CETRI technology development program testing phases and the results thereof; the final testing phase's ability to produce in-situ, verifiable costs and energy intensity metrics for commercial applications and the timing thereof; expectations that Entropy23™ will be a leading technology in the global effort to decarbonize; the benefits to be derived from the MOUs and the expectation that they will result in definitive agreements and completed CCS projects; expectation that the potential CCS projects as described will capture carbon dioxide TPA as disclosed; expectation that there is a significant pipeline of additional potential projects in development; expected benefits of Entropy's technology; Entropy's strategies and plans for its technology and Entropy's focus; and Advantage's strategy and focus. Advantage's and Entropy's actual decisions, activities, results, performance or achievement could differ materially from those expressed in, or implied by, such forward-looking statements and accordingly, no assurances can be given that any of the events anticipated by the forward-looking statements will transpire or occur or, if any of them do, what benefits that Advantage or Entropy will derive from them.

These statements involve substantial known and unknown risks and uncertainties, certain of which are beyond Advantage's and Entropy's control, including, but not limited to: changes in general economic, market and business conditions; industry conditions; actions by governmental or regulatory authorities including increasing taxes and changes in investment or other regulations; changes in tax laws and incentive programs; changes in carbon tax and credit regimes; competition from other

producers; the lack of availability of qualified personnel or management; intellectual property and patent risks; credit risk; changes in laws and regulations including the adoption of new environmental laws and regulations and changes in how they are interpreted and enforced; ability to comply with current and future environmental or other laws; stock market volatility and market valuations; failure to achieve the anticipated benefits and results of Entropy's technology; failure to achieve the anticipated benefits of Entropy's relationships with third parties; ability to obtain required approvals of regulatory authorities; and ability to access sufficient capital from internal and external sources.

With respect to forward-looking statements contained in this press release, Advantage and Entropy have made assumptions regarding, but not limited to: conditions in general economic and financial markets; effects of regulation by governmental agencies; current and future commodity prices and royalty regimes; future exchange rates; royalty rates; future operating costs; availability of skilled labor; timing and amount of net capital expenditures; the impact of increasing competition; that Advantage and Entropy will have sufficient cash flow, debt or equity sources or other financial resources required to fund its capital and operating expenditures and requirements as needed; that Entropy's conduct and results of operations will be consistent with expectations; that Entropy will have the ability to develop its technology in the manner currently contemplated; current or, where applicable, proposed assumed industry conditions, laws and regulations will continue in effect or as anticipated; and the anticipated benefits and results from Entropy's technology are accurate in all material respects. Readers are cautioned that the foregoing lists of factors are not exhaustive.

While encouraging, test result data should be considered to be preliminary until the final phase of the CETRI technology development program has been completed. Such test results are not a guarantee of long-term performance characteristics.

Management has included the above summary of assumptions and risks related to forward-looking information above in order to provide shareholders with a more complete perspective on Entropy's future operations and such information may not be appropriate for other purposes. Entropy's actual results, performance or achievement could differ materially from those expressed in, or implied by, these forward-looking statements and, accordingly, no assurance can be given that any of the events anticipated by the forward-looking statements will transpire or occur, or if any of them do so, what benefits that Advantage and Entropy will derive therefrom. Readers are cautioned that the foregoing lists of factors are not exhaustive. These forward-looking statements are made as of the date of this press release and neither Advantage or Entropy disclaims any intent or obligation to update publicly any forward-looking statements, whether as a result of new information, future events or results or otherwise, other than as required by applicable securities laws.

SOURCE Advantage Oil & Gas Ltd.

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