

PyroGenesis Receives European Patent for the Destruction of Ozone-Depleting Substances with High Power Steam Plasma Torch System

Separately: Secures \$234K Plasma Torch Contract for Methane Conversion

MONTREAL, Jan. 23, 2025 -- PyroGenesis Inc. ("PyroGenesis") (<http://pyrogenesis.com>) (TSX: PYR) (OTCQX: PYRGF) (FRA: 8PY), a high-tech company that designs, develops, manufactures and commercializes advanced plasma processes and sustainable solutions which are geared to reduce greenhouse gases (GHG) and address environmental pollutants, announces the granting of European Patent EP 2 686 100 B1, titled "*Steam Plasma Arc Hydrolysis of Ozone Depleting Substances*". This granted patent covers PyroGenesis' cutting-edge process for the highly efficient destruction of ozone depleting substances, such as used refrigerants from end-of-life cooling apparatus.

This European patent complements PyroGenesis' U.S. Patent No. 11,116,069, [granted in September 2021, and announced in a prior press release](#). Together, these patents strengthen PyroGenesis' SPARC™ technology that specifically targets the destruction of end-of-life (EOL) refrigerants such as CFCs, HCFCs, and HFCs, which are known for their high global warming potential (GWP). EOL refrigerants are potent greenhouse gases with a GWP that can be thousands of times greater than carbon dioxide (CO₂). This patent milestone represents another step in the company's ongoing efforts to address the growing global demand for advanced hazardous waste destruction solutions, driven by tightening landfill regulations and the need for more sustainable disposal technologies.

"Our patented process uses steam plasma in a multi-zone high temperature reactor to efficiently destroy CFCs, HFCs and HCFCs, while minimizing the production of secondary hazardous biproducts and CO₂ emissions, compared to conventional incineration," said Pierre Carrabin, CTO and Chief Strategist of PyroGenesis. "This innovative technology can be applied to a wide range of uses, including destroying ozone-depleting substances and hazardous waste treatment, and addresses the untapped need for this torch technology."

"This patent approval reinforces our position as a leader in the fight against ozone depletion and greenhouse gas emissions," said P. Peter Pascali, President and CEO of PyroGenesis. "This, combined with our earlier U.S. patent, strengthens the intellectual property portfolio for our SPARC™ technology. It allows us to accelerate commercialization efforts across global markets, specifically Europe and the Middle East, while offering a more environmentally sustainable solution to address ozone-depleting substances."

Research suggests that proper management and disposal of HFC refrigerants can help mitigate the effects of climate change, with the potential to reduce global warming by up to 0.5°C by 2100¹. PyroGenesis' SPARC™ technology not only offers an efficient solution for the destruction of ozone-depleting substances but also maintains a low carbon footprint—a critical factor in reducing the overall environmental impact.



With this patent, PyroGenesis continues to accelerate the global deployment of its SPARC™ technology as a safe, effective, and sustainable solution to reduce ozone-depleting substances and greenhouse gases, contributing to a cleaner, more sustainable future.

Separately, PyroGenesis announces the signing of a contract for €156,000 (CA\$234,000) with a European Research Center developing a process to convert hydrocarbons, including methane, into other high value chemicals. The name of the client, a major research and innovation lab in Northwestern Europe, will remain anonymous for confidentiality reasons. This contract requires that PyroGenesis manufactures and designs a 50-kW methane plasma torch as the next step to the system previously purchased by the customer and [announced on February 7, 2022](#). The client continues to develop a novel process to convert hydrocarbons, such as methane, into other chemicals such as olefins (which are widely used as base materials for many products, including plastics, detergents and adhesives) namely ethylene. Ethylene (C₂H₄), an olefinic chemical, is the largest volume organic chemical produced globally and a basic building block for the chemistry industry. The majority of ethylene and propylene are produced from crude oil, which consumes enormous amounts of energy², and generates large amounts of CO₂.³ This new production technique under development aims to replace the traditionally difficult, expensive and inefficient processes that currently exist.

PyroGenesis' development of plasma torches is central to its [three-tiered solution ecosystem](#), addressing critical economic and environmental needs in global heavy industry. **Within the Waste Remediation** tier, SPARC™ leverages high-power plasma torches to safely and efficiently destroy hazardous substances and end-of-life materials, including ozone-depleting substances. This aligns with the company's broader mission, which also includes the

Energy Transition & Emissions Reduction tier, where electric-powered plasma torches enable fuel switching to reduce fossil fuel use and greenhouse gas emissions, and the **Commodity Security and Optimization** tier, which focuses on enhancing resource efficiency and sustainability.

About PyroGenesis Inc.

PyroGenesis, a high-tech company, is a proud leader in the design, development, manufacture and commercialization of advanced plasma processes and sustainable solutions which reduce greenhouse gases (GHG) and are economically attractive alternatives to conventional “dirty” processes. PyroGenesis has created proprietary, patented and advanced plasma technologies that are being vetted and adopted by multiple multibillion dollar industry leaders in four massive markets: iron ore pelletization, aluminum, waste management, and additive manufacturing. With a team of experienced engineers, scientists and technicians working out of its Montreal office, and its 3,800 m² and 2,940 m² manufacturing facilities, PyroGenesis maintains its competitive advantage by remaining at the forefront of technology development and commercialization. The operations are ISO 9001:2015 and AS9100D certified, having been ISO certified since 1997. PyroGenesis’ shares are publicly traded on the TSX in Canada (TSX: PYR), the OTCQX in the US (OTCQX: PYRGF), and the Frankfurt Stock Exchange in Germany (FRA: 8PY).

Cautionary and Forward-Looking Statements

This press release contains “forward-looking information” and “forward-looking statements” (collectively, “forward-looking statements”) within the meaning of applicable securities laws. In some cases, but not necessarily in all cases, forward-looking statements can be identified by the use of forward-looking terminology such as “plans”, “targets”, “expects” or “does not expect”, “is expected”, “an opportunity exists”, “is positioned”, “estimates”, “intends”, “assumes”, “anticipates” or “does not anticipate” or “believes”, or variations of such words and phrases or state that certain actions, events or results “may”, “could”, “would”, “might”, “will” or “will be taken”, “occur” or “be achieved”. In addition, any statements that refer to expectations, projections or other characterizations of future events or circumstances contain forward-looking statements. Forward-looking statements are not historical facts, nor guarantees or assurances of future performance but instead represent management’s current beliefs, expectations, estimates and projections regarding future events and operating performance.

Forward-looking statements are necessarily based on a number of opinions, assumptions and estimates that, while considered reasonable by PyroGenesis as of the date of this release, are subject to inherent uncertainties, risks and changes in circumstances that may differ materially from those contemplated by the forward-looking statements. Important factors that could cause actual results to differ, possibly materially, from those indicated by the forward-looking statements include, but are not limited to, the risk factors identified under “Risk Factors” in PyroGenesis’ latest annual information form, and in other periodic filings that it has made and may make in the future with the securities commissions or similar regulatory authorities, all of which are available under PyroGenesis’ profile on SEDAR+ at www.sedarplus.ca. These factors are not intended to represent a complete list of the factors that could affect PyroGenesis. However, such risk factors should be considered carefully. There can be no assurance that such estimates and assumptions will prove to be correct. You should not place undue reliance on forward-looking statements, which speak only as of the date of this release. PyroGenesis undertakes no obligation to publicly update or revise any forward-looking statement, except as required by applicable securities laws.

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A photo accompanying this announcement is available at <https://www.globenewswire.com/NewsRoom/AttachmentNg/61a5ba28-678a-4a0d-ab90-d6ceffa79c60>

¹ <https://www.epa.gov/climate-hfcs-reduction/frequent-questions-phasedown-hydrofluorocarbons>

² <https://news.usc.edu/135695/climate-change-game-changer-usc-scientists-find-more-efficient-way-to-convert-methane-into-useful-chemicals>

³ Energies 2015, 8, 3739-3761; doi:10.3390/en8053739; Co-Production of Olefins, Fuels, and Electricity from Conventional Pipeline Gas and Shale Gas with Near-Zero CO₂ Emissions. Part I: Process Development and Technical Performance, Yaser Khojasteh Salkuyeh and Thomas A. Adams II, Department of Chemical Engineering, McMaster University