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**UNITED STATES  
SECURITIES AND EXCHANGE COMMISSION  
Washington, D.C. 20549**

**FORM 6-K**

**REPORT OF FOREIGN PRIVATE ISSUER PURSUANT TO RULE 13a-16 OR 15d-16 UNDER THE SECURITIES  
EXCHANGE ACT OF 1934**

**For the month of December 2021**

Commission File Number: **001-39989**

**PYROGENESIS CANADA INC.**  
(Translation of registrant's name into English)

**1744, William St. Suite 200  
Montreal, QC, H3J1R4  
Canada**  
(Address of principal executive office)

Indicate by check mark whether the registrant files or will file annual reports under cover of Form 20-F or Form 40-F.  
Form 20-F [  ]    Form 40-F [  ]

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(1): \_\_\_\_

**Note:** Regulation S-T Rule 101(b)(1) only permits the submission in paper of a Form 6-K if submitted solely to provide an attached annual report to security holders.

Indicate by check mark if the registrant is submitting the Form 6-K in paper as permitted by Regulation S-T Rule 101(b)(7): \_\_\_\_

**Note:** Regulation S-T Rule 101(b)(7) only permits the submission in paper of a Form 6-K if submitted to furnish a report or other document that the registrant foreign private issuer must furnish and make public under the laws of the jurisdiction in which the registrant is incorporated, domiciled or legally organized (the registrant's "home country"), or under the rules of the home country exchange on which the registrant's securities are traded, as long as the report or other document is not a press release, is not required to be and has not been distributed to the registrant's security holders, and, if discussing a material event, has already been the subject of a Form 6-K submission or other Commission filing on EDGAR.

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On December 8, 2021, the Registrant issued a press release, a copy of which is attached hereto as Exhibit 99.1 and is incorporated herein by reference.

#### EXHIBIT INDEX

<u>Exhibit Number</u>	<u>Description</u>
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<a href="#">99.1</a>	<a href="#">Press Release dated December 8, 2021</a>
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## SIGNATURES

Pursuant to the requirements of the Securities Exchange Act of 1934, the registrant has duly caused this report to be signed on its behalf by the undersigned, thereunto duly authorized.

PYROGENESIS CANADA INC.

(Registrant)

Date: December 8, 2021

/s/ P. Peter Pascali

P. Peter Pascali  
Chief Executive Officer

## PyroGenesis Announces the Launch of a New ZCE Hydrogen Production Process Following the Filing of International Patent Applications

MONTREAL, Dec. 08, 2021 (GLOBE NEWSWIRE) -- PyroGenesis Canada Inc. (<http://pyrogenesis.com>) (NASDAQ: PYR) (TSX: PYR) (FRA: 8PY), a high-tech Company (hereinafter referred to as the "Company" or "PyroGenesis"), that designs, develops, manufactures and commercializes advanced plasma processes and sustainable solutions to reduce greenhouse gases (GHGs), announced today the launch of a new zero-carbon emission ("ZCE") hydrogen production technology which is expected to compete with conventional technologies to produce an environmentally-friendly hydrogen. PyroGenesis' new hydrogen production technology is now entering a testing phase and is expected to convert methane (a GHG with a high global warming potential) to hydrogen, thereby creating a ZCE hydrogen. The conventional ZCE process, water electrolysis, is extremely expensive, requires a lot of energy and uses rare earth materials. The accumulation of GHGs in the atmosphere contributes to global warming. Under the Paris Agreement, 191 countries have committed to limit GHGs, while many territories, including the European Union, have committed to be carbon neutral by 2050.

"The conventional method to produce hydrogen is called "Steam Methane Reforming", which produces GHGs as a result", said P. Peter pascali, CEO and Chair of PyroGenesis. "Another technology used to produce hydrogen is called "Water Electrolysis". It has been around for many years and is considered to be a ZCE technology. The hydrogen generated from this process is generally referred to as "Green Hydrogen", however it is recognized to (i) be relatively expensive, (ii) require a lot of energy, and (iii) use rare earth materials. PyroGenesis' new technology is expected to combine the best of both worlds; it is expected to be cheaper than any existing hydrogen process while at the same time producing ZCE hydrogen. The hydrogen generated by this process is referred to as "Turquoise Hydrogen". The Company does not expect that this new process would compete with its iron ore pelletization offering where fossil fuel burners are replaced with plasma torches but, in fact, would complement these plasma torch offerings by providing a hydrogen alternative elsewhere in the manufacturing process."

PyroGenesis has filed an international application No. PCT/CA2021/000099 with WIPO (World Intellectual Property Organization) entitled, "Hydrogen production from hydrocarbons by plasma pyrolysis." This PCT application covers the Company's process for producing hydrogen from methane and other light hydrocarbons using thermal plasma without generating GHGs.

PyroGenesis' technology boasts a theoretical electricity cost 3 times lower than that of water electrolysis to produce the same amount of hydrogen making it one of the most energy-efficient technologies to produce ZCE hydrogen. The technology would be easily scalable, and its capital cost per hydrogen production unit is comparable to that of steam methane reforming technology, the most established commercial technology to produce hydrogen.

The combustion of ZCE hydrogen for heating in industrial processes and in transportation generates water vapor as a combustion byproduct, instead of carbon dioxide, thus reducing GHG emissions worldwide. As a result, many industrial processes are looking to replace fossil fuels and reactants such as coal, oil, and natural gas with ZCE hydrogen. In the iron and steel manufacturing industries alone, the consumption of ZCE is projected to increase from 0.5 million tons per year in 2020 to 12.5 million tons in 2030.<sup>1</sup> Once again, the Company does not expect that this new process would compete with its iron ore pelletization offering where fossil fuel burners are replaced with plasma torches but, in fact, would complement these plasma torch offerings by providing a hydrogen alternative elsewhere in the manufacturing process.

"Filing our U.S. provisional patent application, along with the international PCT application is an important milestone as we move forward with launching a new method for producing ZCE hydrogen through an energy-efficient and reliable plasma process", said Mr. Pierre Carabin, Chief Technology Officer and Chief Strategist of PyroGenesis. "There is a high demand for technologies that use clean renewable electricity. Currently, the only commercially available process to produce clean hydrogen is water electrolysis. In this process, electrical energy is used to convert water to hydrogen and oxygen. However, the water electrolysis process suffers from several drawbacks, including high energy consumption and the need for a high quantity of rare materials, which is not sustainable. We believe our new proprietary hydrogen production process will be much more energy efficient, cost-effective and scalable than other forms of hydrogen production."

### About PyroGenesis Canada Inc.

PyroGenesis Canada Inc., a high-tech company, is a 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 m<sup>2</sup> and 2,940 m<sup>2</sup> 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. For more information, please visit: [www.pyrogenesis.com](http://www.pyrogenesis.com).

*This press release contains certain forward-looking statements, including, without limitation, statements containing the words "may", "plan", "will", "estimate", "continue", "anticipate", "intend", "expect", "in the process" and other similar expressions which constitute "forward- looking information" within the meaning of applicable securities laws. Forward-looking statements reflect the Company's current expectation and assumptions and are subject to a number of risks and uncertainties that could*

cause actual results to differ materially from those anticipated. These forward-looking statements involve risks and uncertainties including, but not limited to, our expectations regarding the acceptance of our products by the market, our strategy to develop new products and enhance the capabilities of existing products, our strategy with respect to research and development, the impact of competitive products and pricing, new product development, and uncertainties related to the regulatory approval process. Such statements reflect the current views of the Company with respect to future events and are subject to certain risks and uncertainties and other risks detailed from time-to-time in the Company's ongoing filings with the securities regulatory authorities, which filings can be found at [www.sedar.com](http://www.sedar.com), or at [www.sec.gov](http://www.sec.gov). Actual results, events, and performance may differ materially. Readers are cautioned not to place undue reliance on these forward-looking statements. The Company undertakes no obligation to publicly update or revise any forward-looking statements either as a result of new information, future events or otherwise, except as required by applicable securities laws. Neither the Toronto Stock Exchange, its Regulation Services Provider (as that term is defined in the policies of the Toronto Stock Exchange) nor the NASDAQ Stock Market, LLC accepts responsibility for the adequacy or accuracy of this press release.

SOURCE PyroGenesis Canada Inc.

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RELATED LINK: <http://www.pyrogenesis.com/>

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<sup>1</sup> IEA, "Hydrogen", IEA, Paris, 2021. <https://www.iea.org/reports/hydrogen>