PyroGenesis Anticipates Positive Economic Impact from Incoming Administration in the U.S.

November20, 2024

Company is encouraged by key campaign promises that will boost industrial innovation and accelerate capital projects and energy grid growth

MONTREAL, Nov. 20, 2024 (GLOBE NEWSWIRE) -- 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, provides the following comments and analysis in response to investor questions about the impact from the upcoming change in U.S. leadership and potential change in policy direction.

In summary, PyroGenesis is positive about the potential economic impact the U.S. election outcome may have on the company. The potential benefits from President-Elect Donald Trump’s campaign promises, in particular the commitments to (i) lower corporate taxation to stimulate business growth, (ii) reduce regulatory burdens and bureaucracy to accelerate project approvals, (iii) expand the energy sector to – in the campaign’s own words – “unleash energy production from all sources, including nuclear”, (iv) “to immediately slash inflation and power American homes, cars, and factories with reliable, abundant, and affordable Energy”[1], are numerous and prescient, as America commits to a future of advanced manufacturing leadership, energy self-sufficiency, and supply chain protection.

“The expectation is that the newly-elected administration’s initiatives will speed up capital projects, stir innovation, increase overall capacity of the energy grid, and lower energy costs. This could be highly beneficial to companies like ours that supply heavy industry with the high-temperature electricity-based solutions needed to modernize, optimize, and compete,” said P. Peter Pascali, President and CEO of PyroGenesis. “Furthermore, we believe that any fears associated with a rumoured U.S. withdrawal from the Paris climate accords or repeal of the green energy incentive-heavy Inflation Reduction Act passed by the Biden administration will have little to no impact on our company, due to a number of important factors (such as the scale of energy transition, rising demand for lightweight metals, power grid expansion and resurgence of nuclear power, continued impact from initiatives started by the inflation reduction act, and our solution/geographic diversification) that I am pleased to outline below.”

Understanding Energy Transition

There have been concerns that the change in American leadership will disrupt the business opportunities inherent in the energy transition movement.

We believe that these concerns represent a fundamental misunderstanding of what energy transition is and where associated business opportunities lie.

Energy transition at an industrial level is not just about replacing one form of energy with another, such as finding substitutions for oil and gas to reduce carbon footprint.

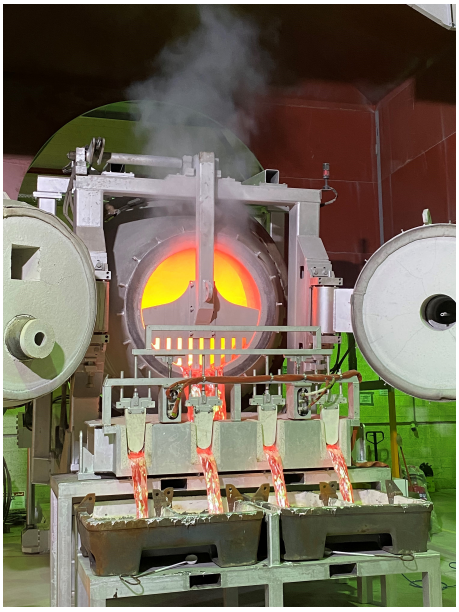
It is also largely about reducing handling, shipping, and storage requirements and costs for fuels, improving the efficiency of heating applications, improving the rate or speed of heating, improving factory working conditions such as air quality, reducing dangerous environments, and reducing injury potential related to combustible or explosive materials.

Industrial Energy Transition



Renewable energy integration into industrial refinery energy grid.

PyroGenesis Drosrite™ Aluminum Metal Dross Recovery System



PyroGenesis technologies targeting lightweight metals are installed around the world

Aluminum



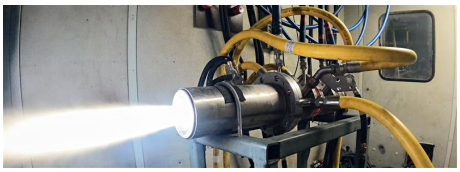
Rolls of newly produced aluminum

Nuclear Power Plant



Nuclear expansion is required for energy grid growth.

PyroGenesis Plasma Torch



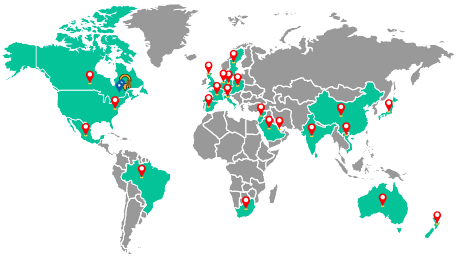
All-electric plasma systems for use in industrial grid infrastructure expansion.

Wind Turbine Manufacturing



Clean-tech projects are widely distributed across the U.S.

PyroGenesis Global Project Locations



PyroGenesis has a growing global presence with sales across 21 countries and counting



It is also about finding new ***uses*** for existing energy forms, and reducing the variety of different fuel sources used at a particular facility in the process, both of which always made practical sense to do so but were not considered possible until recently.

For companies in industries such as aluminum, where electricity has long been the major source of power, having to utilize gas, oil, or diesel in certain heating or melting applications is an added burden logistically. Reducing the energy/fuel types used across an aluminum facility makes logical sense but is only justifiable where quality and cost are not negatively impacted. With advances in electricity-based technology from companies like PyroGenesis, those goals are now more within reach.

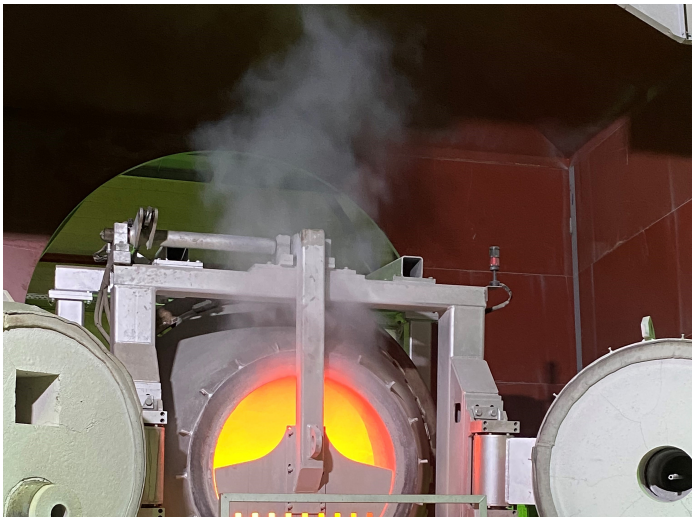
With a multitude of criteria driving industrial energy transition, any U.S. reduction in carbon-specific initiatives is only impacting a portion of the overall decision-making benchmarks.

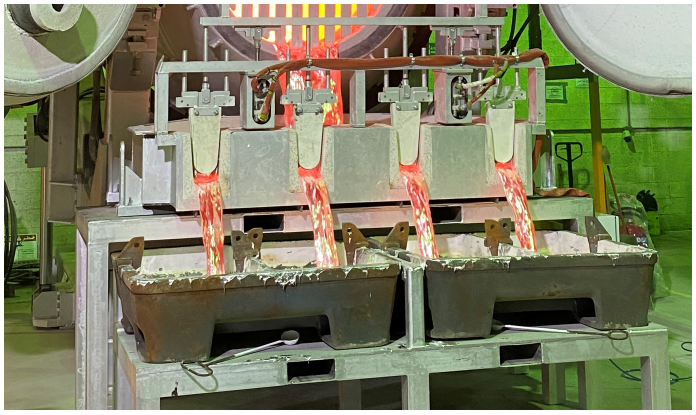
Rising Demand for Lightweight Metals: Our Strength in Aluminum and Titanium

Lightweight metal industries showcase perhaps the best example of the scale of opportunities available in energy transition, as well as the impact these industries are having in other areas – impact that is necessitating change that further benefits PyroGenesis.

PyroGenesis has long had business strength in lightweight metals. The aluminum industry is a major source of revenue for the company's business and is growing. Separately, the company is pushing to have its titanium metal powders produced by its patented NexGen plasma atomization metal powder production system breakthrough in the additive manufacturing market.

Numerous PyroGenesis technologies targeting lightweight metals are already deployed in the field or in development. From PyroGenesis' Drosrite™ aluminum metal dross recovery systems [see image below] installed around the world, to plasma torch burners currently being developed with/for multi-billion dollar entities for various heating and melting applications in reverberatory/holding furnaces and tanks, to burners for carbon anode baking furnaces, dross residue valorization, and spent pot lining recovery and valorization. And more applications are under development.





PyroGenesis' growing position in this sector is key, as aluminium demand is expected to increase by almost 40 per cent by 2030 and the aluminum sector will need to produce an additional 33.3 Mt to meet demand growth in all industrial sectors – from 86.2 Mt in 2020 to 119.5 Mt in 2030.[2] Further out, other estimates see a demand increase of 80% by 2050.[3]

Currently, industrial output in the aluminum industry exists outside of the U.S. political sphere of influence. Once one of the top producers in the world, peaking at 30 smelters in the 1980s, the U.S. now has very few aluminum producers, with only four active smelters for primary aluminum remaining on U.S. soil.[4]



Additionally, the global shift to renewable energy that continues to occur will only further impact demand for aluminum. Everything from lightweight electric vehicles, to wind turbines, to solar panels, to the cabling used to transmit the power generated from these renewable sources to national grids requires aluminum as a critical raw material.

For example, aluminium is the single most widely used mineral material in solar photovoltaic [PV] applications, accounting for more than 85% of the mineral material demand for solar PV components. Electric vehicles utilize aluminum components extensively for weight reduction, both in the structural and battery elements. EV batteries often utilize aluminum housings, and growing momentum exists of a potential future for aluminum-ion batteries.[5]

As further testament to the global aluminum demand brought about just by these three products related to the renewable economy, China's three fastest-growing exports, in dollar-value terms, are cars, solar panels, and batteries.[6]

Rising aluminum demand produces two additional issues that PyroGenesis also sees as beneficial to its future:

1. Primary aluminum production itself is a power-intensive process. To prevent offsetting the decarbonization and efficiency gains achieved through the use of lightweight aluminum, product manufacturers will require the production of aluminum to adapt and reduce its carbon footprint and use of fossil fuels where possible. PyroGenesis plasma-torch burners in heating

and remelting furnaces and tanks are well positioned for just such a task, especially as the aluminum industry is expected to turn more aggressively to secondary (scrap) metal as an alternative source, as it uses 95% less energy than primary aluminum to produce.[7]

The net result is that aluminum offers both the lightweight strength desired by manufacturers, and a route to decarbonization, via use of recycled metals and a reduction in energy types achieved by expanding electricity-based technologies across the factory application spectrum. Once again, this provides PyroGenesis with a global business opportunity notwithstanding any U.S. policy shifts.

2. The move to more renewable energy and a powering-up of advanced manufacturing will require an expansion of the power grid. As a company producing electricity-based technology solutions, any additional increase to the grid is of great benefit to PyroGenesis and its clients.

The Trump administration has specifically highlighted power grid expansion in its campaign platform and, as outlined below, the expected grid expansion worldwide – particularly with nuclear energy as a key component – is expected to have long-lasting benefits, both for those who require the additional energy and for those like PyroGenesis who contribute solution infrastructure. PyroGenesis looks forward to such a rollout in the years ahead, no matter the energy source mix.

PyroGenesis Benefits from Impending Grid Expansion and Resurgence of Nuclear Power

Energy consumption is rising fast due to a broad-based electrification effort in homes and factories, changes to weather mandating more widespread interior cooling technologies, industrial requirements, and especially the vast needs of data centers powering the development of artificial intelligence and cryptocurrency mining.

Electricity consumption from data centres, artificial intelligence (AI) and the cryptocurrency sector could double by 2026. Data centres are significant drivers of growth in electricity demand in many regions. After globally consuming an estimated 460 terawatt-hours (TWh) in 2022, data centres' total electricity consumption could reach more than 1,000 TWh in 2026. This demand is roughly equivalent to the electricity consumption of Japan.[8]

To prepare, energy grid investment globally needs to double to more than $600 billion a year by 2030 if nations are to meet climate targets, according to the International Energy Agency.[9]

Existing renewable energy is not enough to accomplish this goal. All energy sources will need to be considered including, as President-Elect Trump has outlined, more oil and gas, and more nuclear. This of course must include more renewable energy to not only aid in the overall grid supply, but also to provide manufacturers with the types of energy they need for their manufacturing goals as outlined above.

At COP 28, the United Nations Climate Conference held in Dubai in 2023, more than 110 countries committed to triple renewable energy capacity worldwide by 2030, while 22 countries – including Canada – agreed to triple nuclear energy capacity by 2050.[10]



Around the world, countries are once again making nuclear power a critical part of their energy strategies and nuclear generation is forecast to grow by close to 3% per year on average through 2026. France and Japan are conducting maintenance work and restarts on nuclear production at several plants. China, India, Korea, and Europe all have new reactors beginning commercial operations. Canada has developed a small modular reactor action plan and roadmap.[11] Its most populous province Ontario has already begun the refurbishment of 10 reactors over 15 years. The Canadian federal government revised its Green Framework to explicitly permit "the deployment of nuclear energy" that was previously excluded from earlier drafts of the Framework.[12] In November 2024, a Canadian firm was awarded a contract to deploy the country's CANDU nuclear reactor technology for two reactor builds in Romania, the first since 2007.[13]

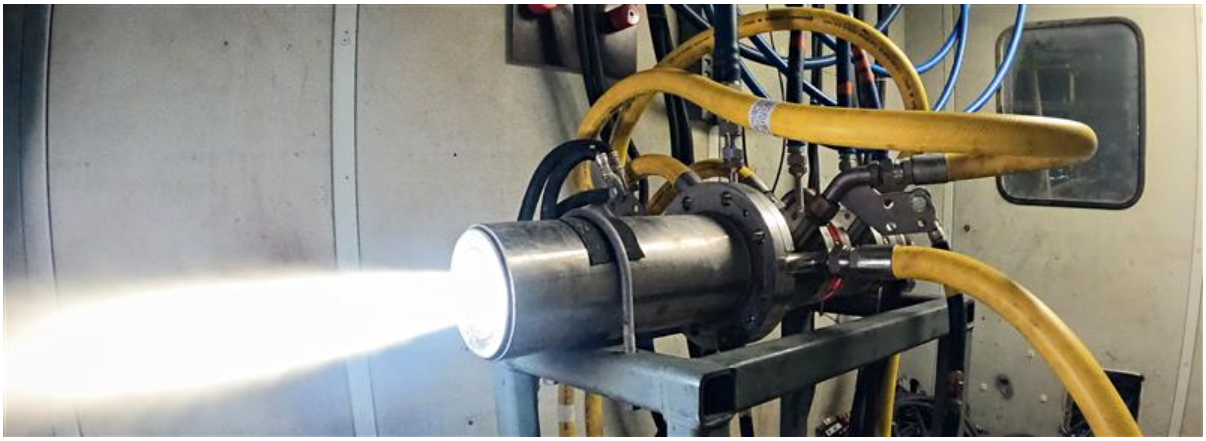
The United States has significant plans for nuclear expansion as well. In August 2024, President-Elect Trump vowed to dramatically increase energy production, generation, and supply to reduce electricity costs and deliver more electricity to the industries that require it, by not only adding to the country's oil and gas production, but also fast tracking the production of new power plants and modular nuclear reactors: "Starting on day one, I will

approve new drilling, new pipelines, new refineries, new power plants, new reactors and we will slash the red tape. We will get the job done. We will create more electricity, also for these new industries that can only function with massive electricity."[14]

Former U.S. Interior Secretary David Bernhardt, after reviewing the Republican's official plan, said the President-Elect aims to "support nuclear energy production by modernizing the Nuclear Regulatory Commission, working to keep existing power plants open and investing in innovative small modular reactors." Bernhardt added, "President Trump will fully modernize the electric grid to prepare it for the next 100 years, implement rapid approvals for energy projects, and greenlight the construction of hundreds of new power plants to pave the way for an enormous growth in American wealth". [15]

Energy grid upgrades over the next few years in the United States and around the world are likely to be significant. As a result, grid infrastructure expansion and upgrading are unlikely to be negatively impacted by any policy changes. In fact, they will likely receive beneficial incentives or fast-tracking due to demand across different energy types and industries, for both private and public sectors, and across corporate and individual end users.

In many aspects, PyroGenesis views all-electric plasma systems [PyroGenesis plasma torch image below] as an extension of grid infrastructure, at least with respect to final-mile industrial grid upgrades. The company has plans to work with clients to include plasma technology as part of grid infrastructure initiatives and to seek exceptions where needed under these auspices.



Grid infrastructure and power equipment, including transmission lines, transformers, and peripherals for both renewables and fossil fuels, will doubtless benefit from preferred status as grid expansion initiatives take hold.

This understanding of rising power demand and its ramifications perhaps provides a more rounded perspective of the fate of existing energy or green technology-focused policy measures. This leads to a closer look at the state of the U.S. Inflation Reduction Act:

The Impact and Future of the U.S. Inflation Reduction Act

The U.S. Inflation Reduction Act (IRA) includes ~$500 billion and potentially up to $1 trillion in federal funding for climate-related efforts and provides funds toward the decarbonization of the U.S. economy, including tax credits, incentives, grants, and loan guarantees. This funding is spread across replacing energy infrastructure, incentives for private investment in clean energy, transport, and manufacturing, and consumer incentives.

President-Elect Trump was highly critical of the IRA at various points during his campaign. However, going so far as to repeal the IRA in its entirety is doubtful, notably due to the reasons outlined above, but also due to the following:

> First, the United States simply needs more power.
>
> U.S. electric load is growing significantly faster than grid planners previously expected, led by new manufacturing and industry and the growth of data centers for AI and crypto mining, as well as contributions from electrification, hydrogen production and severe weather. During 2023, U.S. grid planners doubled their 5-year load growth forecast, from the 2.6% originally forecasted in 2022 to 4.7% growth over the next five years, as reflected in 2023 Federal Energy Regulatory Commission (FERC) filings.[16]
>
> Matching this load growth with grid growth will be almost impossible to do without many of the renewable energy measures that the IRA instigates.
>
> Second, support for clean energy is widespread, even on the political right, owing to the impact on the local economies where clean energy projects are sited: lower energy bills; energy security; and, most importantly, jobs.
>
> Of the more than $200 billion in cleantech manufacturing investments announced in 185 House districts up to June 2024, 65% to 80% of those investments went to Republican held states, with 9 of the top 10 congressional districts for cleantech investments represented by Republicans.
>
> Third, of the top 25 congressional districts for announced cleantech manufacturing investment, 21 are Republican held. Those 21 districts alone account for an aggregate $119 billion of investment — more than half the national total — and more than 80,000 jobs of the 200,000 total jobs.[17]



There are now 900 manufacturing plants in the United States' clean energy industries, 60% of which are located in Republican-led states and congressional districts.[18] As recently as October 22, 2024, the Department of Energy announced $428 million funding for 14 clean energy manufacturing projects in 15 U.S. communities with decommissioned coal facilities.[19]

Last but not least, while cleantech and renewable energy manufacturing is responsible for significant job growth, the same cannot be said of the oil and gas sector.

The industry's historical boom and bust cycle and relentless focus on efficiency has resulted in fewer workers needed to produce more oil.

Despite U.S. oil and gas production hitting record highs, the industry employs 73,000 fewer people than it did in 2019. The drop is more precipitous after 2014 and the shale-oil boom, when more than 600,000 people worked to produce oil and gas. By August 2024, that number was down to 380,000 people producing 45% more gas and 47% more oil – even while pumping an average of 13.4 million barrels a day, a new crude production record.[20]

All told, employment in the oil sector is down nearly 20 percent from pre-pandemic levels.

This helps outline the important difference between legacy and new energy industries. The latter is heavily focused on manufacturing and assembly plants that employ thousands of personnel at each factory location, which further emphasizes the appeal of green energy projects to Republican-held jurisdictions – even those who initially opposed the IRA.

Overall, the IRA energy initiatives are arguably far enough along that resistance from President-Elect Trump could hurt local American economies. Given the extent of red-state initiatives, curtailment of these projects would likely face opposition from within the Republican party.

Significant changes to IRA tax credits and industrial or manufacturing incentives and reversing corporate tax cuts of any type may prove unpopular in both parties and will meet opposition. One possible outcome is a "levelling of the playing field" approach, where oil and gas producers receive similar tax incentives, and where the emphasizing of energy independence brings oil, gas, renewables, and nuclear together as equals for the greater good of the grid.

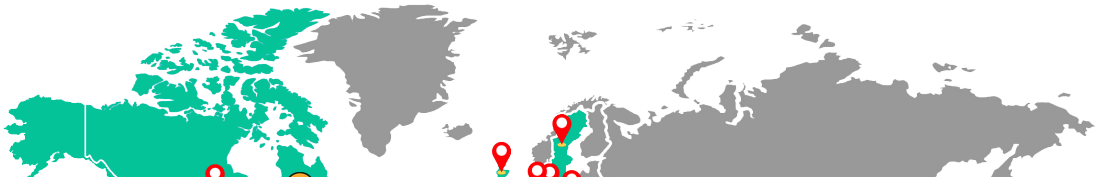
If President-Elect Trump's promises to increase oil and gas production come to pass, they will be most beneficial to expansion of the energy grid. However, with the U.S. already having become the world's largest oil and gas producer [21], the impact on jobs and local economies may be low relative to those impacted by green energy projects.

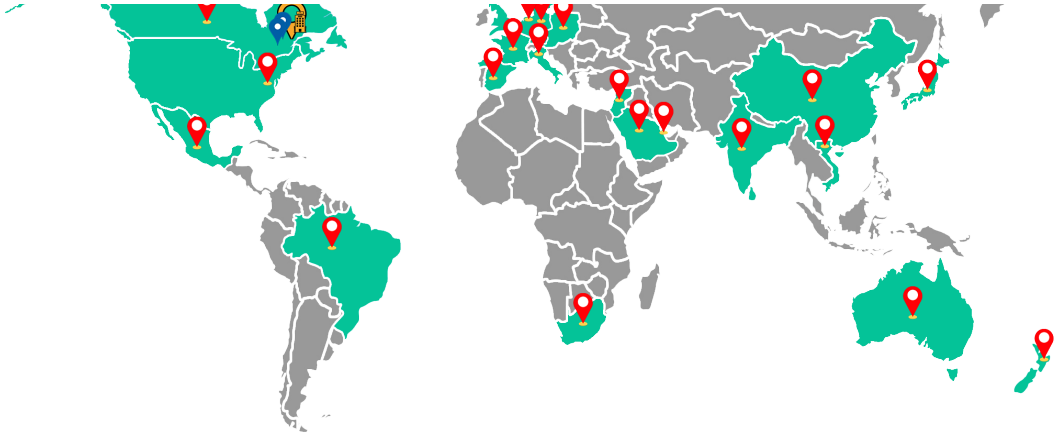
For the reasons above, PyroGenesis does not anticipate changes, if any, to the IRA under the Trump administration will have an adverse effect on the company's business.

PyroGenesis' Advantage in Diversification of Solutions and Geographies

Diversification has long been a theme for PyroGenesis, where a "multi-legged stool" approach built around a solution-set with interconnected technology has helped to insulate the company from risks that might affect any one product or solution line.

Similarly, as the company has expanded, its customer base has become less centered in any one geographic region.





Moreover, while a Canadian company with roots and facilities in Quebec, PyroGenesis' value chain is U.S. based. Many of our systems or components are already manufactured in the U.S. and have been for years.

In addition, PyroGenesis recently changed its name to PyroGenesis Inc. from PyroGenesis Canada Inc. (and simultaneously to PyroGenèse Inc. from PyroGenèse Canada Inc. in French). As Mr. Pascali said at the time, the change was a subtle but important one that better reflects the global impact of the company, with sales across 21 countries and counting, and was part of an initiative to better express in all areas of communication that PyroGenesis is an internationally focused company with global reach.

This global approach and perspective provide significant advantages for the company.

Clients in some regions are afforded advantages by utilizing carbon offsets, reducing carbon penalties, or receiving eco-grants to help purchase PyroGenesis technologies. In areas where these incentives are lacking, it is important to note that the economics with respect to all-electric plasma-based systems have improved dramatically over time. The price of the technology has become more in-line with the legacy technology it is replacing while offering a variety of gains including efficiency, speed, safety, and air quality, amongst others, that negate resistance to the technology on a head-to-head basis vs. legacy.

Whether the U.S. scales back or withdraws from climate-focused initiatives such as the IRA or the Paris Climate Accords, institutes tariffs against certain foreign manufacturing, or systemically favours oil and gas, PyroGenesis believes it will remain relatively unaffected for all of the reasons noted above.

In conclusion, specific to the recent U.S. election, PyroGenesis is encouraged by the economic and stimulus policy measures announced by President-Elect Trump during the campaign and is confident that the company is well positioned to take advantage of the business- and heavy industry-friendly benefits that may arise from Trump administration's policies going forward.

About PyroGenesis Inc.

PyroGenesis Inc., 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 m^2 and 2,940 m^2 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.

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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.

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