



Public Information on the Semiahmoo RNG Facility

PREPARED BY ANDION | SEPTEMBER 2023



A Statement from Semiahmoo First Nation

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September 2023



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Semiahmoo First Nation is extremely excited to be a catalyst in pioneering clean technology in Canada. As stewards of the land, it is our inherent responsibility to protect and preserve our traditional territories. Indigenous Nations are at the forefront of sustainability and environmental best practices in this modern world where waste and greenhouse gas (GHG) emissions play an increasingly detrimental role in all our lives. Through the development of a state-of-the-art Renewable Natural Gas (RNG) facility, Semiahmoo First Nation, along with our partners at Andion North America, are actively addressing the waste management crisis in Metro Vancouver, lowering GHG emissions, and displacing harmful fossil fuels. In doing so, we are also lessening our dependency on big industry and meeting the clean energy needs of FortisBC customers who will receive the RNG we produce, and the Fraser Valley farmers who will benefit from the nutrient-rich by-product we are able to capture in our process that will go towards more sustainable local farming. As we continue the process of finalizing the project we will be engaged in meaningful dialogue with neighbouring municipalities and information sharing with residents around our sovereign lands.

As of today, the Semiahmoo RNG project is still in the process of development. We have established technical and financial feasibility for the project as well as having taken into consideration various environmental, federal, and regional regulatory requirements required for such a facility. We're pleased to have received federal funding from NRCan as it will help us move the project forward, but we have much to do before we get to a point where we are ready to break ground. We want to ensure our neighbours and those concerned that we are adhering to the appropriate guidelines and environmental standards put forward by Metro Vancouver, the Province of British Columbia, and Indigenous Services Canada among others such as Metro Vancouver.

We chose to develop an RNG facility because, in addition to its environmental benefits, it is a proven technology that can be deployed right away. We've found Andion to be an extremely integral piece to not only the Nation but the neighbouring regions. In coming to this decision, we underwent a process of extreme due diligence before selecting Andion and we experienced their expertise first-hand by visiting live projects in Europe and seeing the benefits of renewable energy, waste reduction, and fossil fuel abatement. We also have spent a great deal of time in performing due diligence in selecting a technology solution that not only is highly reliable and efficient in generating renewable energy but also ensures that the facility can comfortably co-exist within the existing community. Andion has completed over 50 projects in Europe without incident or disruption to the neighbouring communities.

This project addresses the increasing waste management and energy consumption needs of the growing populations on our traditional territory. We want to do our part to minimize waste accumulation in local landfills as well as the trucking and freight of waste that goes into other indigenous territories. We are acting in conjunction with the provincial and federal governments who support the project based on the need to regionalize renewable energy production to reduce carbon emissions and decrease our reliance on fossil fuels.



RNG Quick Facts

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RNG Quick Facts

RENEWABLE NATURAL GAS (RNG) HIGHLIGHTS

As opposed to Natural Gas, Renewable Natural Gas (RNG) is not derived from fossil fuels. It is created by breaking down existing waste (agriculture, manure, food waste). It is a carbon-negative fuel source, which means it takes more carbon out of the environment than it produces.

Because it diverts waste that would otherwise sit in landfills, Renewable Natural Gas prevents the methane from rotting food from entering the atmosphere (a greenhouse gas that is 80x more damaging than Co₂) and instead captures that methane for clean energy use.

ABOUT ANAEROBIC DIGESTION

Anaerobic digestion (AD) is a natural process where bacteria break down organic material and produce methane (also called Renewable Natural Gas), which can then be used as fuel in place of gas retrieved from harmful extraction methods.

Unlike composting, which allows food to break down in an open environment, AD captures and uses the gases that result from organics decomposing and therefore reduces GHG emissions. With Andion's AD solution, the AD process produces renewable natural gas (methane), which is captured for energy generation. The amount of carbon dioxide that is also produced as part of the AD process is much less than the amount of carbon dioxide produced during composting, thus the AD process results in less GHG emissions than composting.

AD has the potential to reduce global GHG emissions equivalent to 10-13 per cent of the world's current greenhouse gas emissions.

UNDERSTANDING MEASUREMENT OF RNG

In Canada, we measure RNG as GJ – gigajoules. That's one billion joules, which is a measurement of a kg of mass moving at the speed of one meter per second. But it's easier to understand joules when compared with other types of energy that we're familiar with. 1 GJ of renewable natural gas has the same amount of energy as 26.1 litres of fuel oil, 39.2 litres of propane, or 278 kilowatt hours of electricity. Most simply put, one GJ of RNG is equivalent to 4,633 hours of an average 60-watt lightbulb.



Benefits of a Typical RNG Project

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Benefits of a Typical RNG Project

Below is a sample outline of the benefits to the local economy and the environment of one of our projects.

- The project will eliminate approximately 55,000 tons of greenhouse gas emissions (GHG) every year (that's 1,100,000 over the project lifespan)
- The annual amount of GHG reduced is equivalent to taking 11,800 cars off the roads annually and reducing gasoline consumption by over 22,700,000 liters.
- Diversion of 70,000 tons of organic food waste every year from the civic waste stream, which would otherwise end up in non-sustainable disposal sites like landfills or incinerators.
- The project will help avoid the use of 22,000 tons of chemical fertilizers annually (that's an avoidance of 26,400,000 GJ of fossil fuels)
- The project will generate 3.5M GJ of Renewable Natural Gas, which is equivalent to providing over 37,000 homes with clean energy.

ECONOMIC BENEFITS:

- 14 full time jobs and job training opportunities
- \$50 million+ invested in the project co-owned by First Nations
- First Nation given priority to new jobs created
- Access to new infrastructure and services provided to the First Nation

The project will provide the First Nations community with quality jobs, improved infrastructure and an equity interest. As a result of job creation, training and investment.

The lease is short (25 years) after which the First Nation will own the project entirely and can operate as they see fit. Or, if decommissioning is preferred at that time, we will remove the facility and return the land to its original state.



ENVIRONMENTAL BENEFITS:

- Carbon-negative energy generation
- No disruption of existing waterways
- No use of well water in the project
- No noise or odour impact to surroundings

The project is located on the reserve lands of one of Canada's First Nations. Indigenous Services Canada (ISC), Natural Resources Canada (NRCan) and Canadian Infrastructure Bank (CIB) have to approve the appropriate environmental permits and authorizations for the development of the project.

WASTE REDUCTION:

- Abatement of nearly 1.5M tons of waste that would otherwise end up in landfills or incinerators
- 30,000 tons from households
- 30,000 tons from commercial/industrial
- 10,000 tons fat/oils/grease

The source material (called feedstock) comes from food waste: food scraps from homes; restaurant food waste including fats/oil/grease; and grocery store expired foods. Partially treated used water that has had the majority of phosphorous and nitrogen removed to the level that it can be discharged to the sewer system will be sent for final treatment at a wastewater treatment plant.

Organic waste (food waste and yard waste) comprises up to 40% of municipal solid waste regionally. Currently, there is less processing capacity in the region than organics that are collected.



Preventing Odours and Air Pollution with Advanced Technologies

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Preventing Odours and Air Pollution with Advanced Technologies

For the purposes of educating the public on the benefits of RNG today.

Andion's facility takes odour into account right from the design phase of the project.

The entirety of operations will take place within enclosed spaces. There will be no waste/garbage left outside. Bulk food waste is delivered by truck to unloading bays. No human waste or sewage is processed at this facility.

The vehicles will reverse into an available truck bay and discharge the organic waste into a dedicated and contained area. Door bays are open only during the tipping process and immediately closed afterwards. Once inside, all buildings are under a vacuum where odour is drawn to the biofilters. All waste is processed within 2 days ensuring minimal time for the organic matter to decompose.



Preventing Odours and Air Pollution with Advanced Technologies

For the purposes of educating the public on the benefits of RNG today.

Biofilters are massive beds (495m² or 5328 ft²) containing mossy wood chips that absorb the majority of odours from the organic waste. Bacterial cultures are grown within the woodchip matrix creating a biofilm that further removes odour and produces an earthy scent.



The biogas that is generated from the Anaerobic Digestion will contain H₂S and VOC's (volatile organic compounds) which will be sent through two cleaning processes: One scrubbing tower to clean out ammonia; and a second other scrubbing tower to clean H₂S before being sent to the biofilter for further reduction.



Understanding the Air Dispersion Modelling Report

The Air Dispersion Modelling Report conducted for this project assess the dispersion and concentration of emissions into the atmosphere of the facility operating under the most conservative conditions. In short; the report looked at where the emissions would go. The modelling adhered to Metro Vancouver standards and guidelines, which is one of the strictest in the world.

Table 6-1 (pg. 32) Illustrates impact of the addition SO₂ and NO₂ from the facility. The Background NO₂ is already near the threshold (69 ug/m³) so in the worst conditions, there are some exceedances to the air quality (ex. Fig 5.2b). The facility itself produces well under criteria threshold. The annual averaging show that neither NO₂ nor SO₂ produced.

On Odour, the report uses the measurement of "OU," which provides a standard metric to identify the strength of an odour. While an odour assessment in terms of OU provides a quantitative measure to compare between jurisdictions, it does not provide a qualitative description of odour related to nuisance - e.g. hedonic tone.

Hedonic tone, or the perception of an odour, is an important odour property for the assessment of annoyances. It doesn't tell us how bad a smell might be, For example, a strong smell from baking cookies would probably be significantly less bothersome than a weaker sewage-like smell. Odour from the biofilter will be earthy and like mushrooms. No human waste or sewage make up the feedstock of this facility.

In the report's Table 5.9 (pg. 29), it shows that in the worst weather conditions, there might be up to six times a month when the smell reaches a level of 10 OU near the Hills at Portal Golf Club, next to Highway 99 and the proposed Facility. It is not anticipated that 10 OU will be exceeded at any other receptor or residence.

Under conservative conditions, annual odour exceedances beyond 1 OU by residences are not expected to surpass 24 times in a year. (Fig 5.22) Less than half of these occur during the spring and half occur during the night. (Fig. 5.27-5.28)

As for other emissions, Health Canada is checking this report to make sure it's safe for the community. We're answering all their questions to ensure they do not pose any health threat to the community.



Frequently Asked Questions

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Common Concerns and Questions About the Facility

I LIVE DOWNWIND AND I AM CONCERNED ABOUT THE SMELL.

We hear you – no one wants to have to breath foul air all day, especially at home. Andion conducted tests to see if smells disperse in the air under the worst-case conditions. We measured the potential impact of these smells. For example, even in the worst-case scenario--which is unlikely--no odour would be detectable for 98% of the time.

According to the data, there will be very few occasions where nearby residents might detect the smell, and most of those instances occur overnight. To handle and minimize any potential odor issues, Andion plans to create an 'Odour Management Plan' to monitor and take appropriate actions.

Andion has completed over 50 projects in Europe, and odour has never been an issue for surrounding communities.

WHAT ABOUT TRAFFIC? WE LIVE IN A QUIET COMMUNITY, I DON'T WANT A FLEET OF TRUCKS DISTURBING THE PEACE.

The traffic count is an average of 20 trucks a day. They will be transporting waste and leaving the facility once the waste has been delivered. An independent third party conducted a comprehensive Technical Due Diligence review of idling and transportation. Their analysis focused on the effects of border traffic, and it revealed that the impact on traffic is minimal. Our truck strategy adopts a one-truck-at-a-time approach during off-peak hours, effectively mitigating potential adverse effects on air quality.

There will be no additional trucks transporting water or natural gas.

The nutrient digestate that will go to the farms in the Fraser Valley will be transported by trucks, but these are included in the total per day (20) as stated above. The same trucks delivering the waste will take away the digestate, a system known as backhauling to reduce the traffic.

The number of trucks is calculated as an average. Different sizes of trucks are expected to deliver the feedstock during operation. There may be more or less depending on the day and time of year, operating at off-peak hours and not on holidays or weekends.

THE LOCATION IS RIGHT NEXT TO THE CANADIAN-US BORDER. IT'S NOT VERY WELCOMING TO VISITORS.

We understand the public's concerns that the facility will look unsightly, especially so close to the land border crossing for visitors coming to Canada. To address this, we have a landscaping budget to ensure the facility is as green as possible, and we will be commissioning a First Nations artist to paint the Anaerobic Digesters with murals. If you've been to Granville Island and seen the cement siloes painted with murals, you'll understand what a difference it makes, and that it actually becomes a landmark rather than an eye sore.



Common Concerns and Questions About the Facility

WHO HAS OVERSIGHT OVER THIS PROJECT? HOW DO WE KNOW THAT IT'S ADHERING TO STRICT ENVIRONMENTAL STANDARDS?

The Environmental Impact Assessment is still under review but will be made available to the public. An air permit and Solid waste license with Metro Vancouver will also be submitted and made available for public notification. In addition to these we have done related studies, such as an Air Dispersion Modelling Report, and an Archaeological study.

We are exploring regulatory measures through a variety of federal and municipal means to ensure that the facility will be regulated similarly to projects off-reserve. You can find out more about the federal Impact Assessment Act environmental review process here: <https://iaac-aeic.gc.ca/050/evaluations/proj/85705?version=16761>

WHO IS ANDION AND WHAT CREDENTIALS DO YOU HAVE?

Andion has completed over 50 projects in Europe without incident or disruption to the neighboring communities, which has been in operation for over a decade in Europe. This is the first facility in North America to be developed by Andion Global.

In partnering with Semiahmoo First Nation, Andion underwent a process of extreme due diligence and in doing so demonstrated our expertise first-hand by hosting representatives of the nation at live projects in Europe so that they could see the benefits of renewable energy, waste reduction, and fossil fuel abatement. We also have spent a great deal of time in performing due diligence in selecting a technology solution that not only is highly reliable and efficient in generating renewable energy but also ensures that the facility can comfortably co-exist within the existing community.

WHAT WATER IS USED, AND HOW?

Some water is required for the processing of the organic material. Any water that is not recycled will be treated and discharged into the sewer system that is processed by MVRD Anaccis island.

No well water is used in the facility.

WHERE DOES THE GAS GO ONCE IT'S PRODUCED? DO NEW PIPELINES NEED TO BE BUILT?

The advantage of renewable natural gas is that it uses existing infrastructure. In this case, we are partnering with Fortis BC who will purchase the gas that we produce and transport it via their pipelines.

As part of the project development, FortisBC natural gas pipelines will be extended onto the Reservation, delivering for the first time, a new and efficient energy source for the Semiahmoo First Nation to cook and heat their homes. The cost of this development will be borne by the Project, it is not a public expense.



Common Concerns and Questions About the Facility

WHAT MATERIALS ARE BEING USED IN THE PROCESS? WILL THEY BE STORED ON SITE?

The organic material will be sourced from residential communities (compost/food scraps), restaurants (fats, oil, grease and food scraps) and possibly grocery stores or other commercial food sources. No human waste, known as biosolids, will be accepted at this facility. Biohazardous waste from medical facilities and laboratories will not be accepted either.

The facility will process an average of 70,000 tonnes of organic material per year.

ARE THERE ANY BIPRODUCTS?

A nutrient dense digestate that can replace synthetic fertilizers (which are produced using fossil fuels) is a helpful by product of the process.



Renewable Natural Gas, Anaerobic Digestion and a Global Waste Problem

PREPARED BY ANDION GLOBAL

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RNG, AD and a Global Waste Problem

For the purposes of educating the public on the benefits of RNG today.

Biomethane, or Renewable Natural Gas (RNG) is a proven, clean technology. Known as a drop-in fuel, RNG can directly substitute or complement natural gas without any new infrastructure or retrofitting required. There are more than 300 active operations in Canada already reducing carbon dioxide and methane emissions by 8Mt per year and generating more than 20 PJ of energy.



Biogas & RNG reduces methane emissions (which have 80x the global warming potential of carbon dioxide emissions), offsets fossil fuel use, diverts organic waste, leverages existing infrastructure, and recycles nutrients back into ecosystems. However, Canada is only tapping 13% of its biogas & RNG potential, and there is currently no federal government policy that supports the development of this sector as a renewable energy solution.

This letter aims to provide an objective assessment and highlight the turn-key technologies of RNG. The goal is to promote the understanding and awareness of RNG as a commercially viable and readily available clean energy source for Canada, and encourage its development and use in place of traditional fossil fuels in Canada.



THE ENVIRONMENTAL IMPACT OF ORGANIC WASTE

Organic waste is a global environmental problem. Every year, 1.3 billion tons of food – approximately 1/3 of all food produced in the world for human consumption – is lost or wasted. The resources consumed to produce wasted food have a carbon footprint of approximately 3.3 billion tons of CO₂. There are also harmful environmental consequences to this wasted food disposed of in landfills, as rotting food produces methane, a potent greenhouse gas with 80 times the global warming potential of carbon dioxide. Rain can also carry contaminants from the landfill and this leachate can cause serious environmental problems. Other options for managing food waste include burning but this contributes to air pollution and is highly inefficient as food waste is composed of approximately 75 per cent water and burning requires considerable energy.

THE SOLUTION: ANAEROBIC DIGESTION

The best possible environmental, social, and economic use of this waste is to recover its energy. Anaerobic digestion (AD) is a natural process where bacteria break down organic material and produce biogas, which can then be used as fuel in place of gas retrieved from harmful extraction methods. A report titled “Global Potential of Biogas”, published in July 2019 by the World Biogas Association, stated that “AD has the potential to reduce global GHG emissions by 3,290 to 4,360 Mt CO₂ eq., which is equivalent to 10-13 per cent of the world’s current greenhouse gas emissions. This is achieved through the generation of renewable energy in the form of biogas from the anaerobic digestion of wastes and landfill gas, combined with emissions avoided through the management of organic wastes and avoided fossil fertilizer manufacture, crop burning and deforestation.” This process is becoming increasingly important as awareness of climate change is heightening, encouraging countries to create renewable energy sources. AD is the best alternative for processing food waste and feedstock since food waste has significant energy potential.

THE BIOGAS POTENTIAL FOR A CIRCULAR ECONOMY

Significant market opportunities for new anaerobic digestion plants exist in North America, Italy, and the Nordic region. Many countries are investing in technologies that enable a circular economy to accelerate the transition to a resource-efficient and bio-based recreation of waste while also generating economic, natural and social capital. Canada has introduced 21 federal and provincial programs to attract alternative and renewable energy companies and develop new renewable energy products. In Europe, specifically the Nordic region, governments have announced grants for the achievement of a circular economy mandate. In Italy, a country with large organic waste issues, landfill bans and renewable biogas price incentives are driving the construction of multiple new biogas plants.

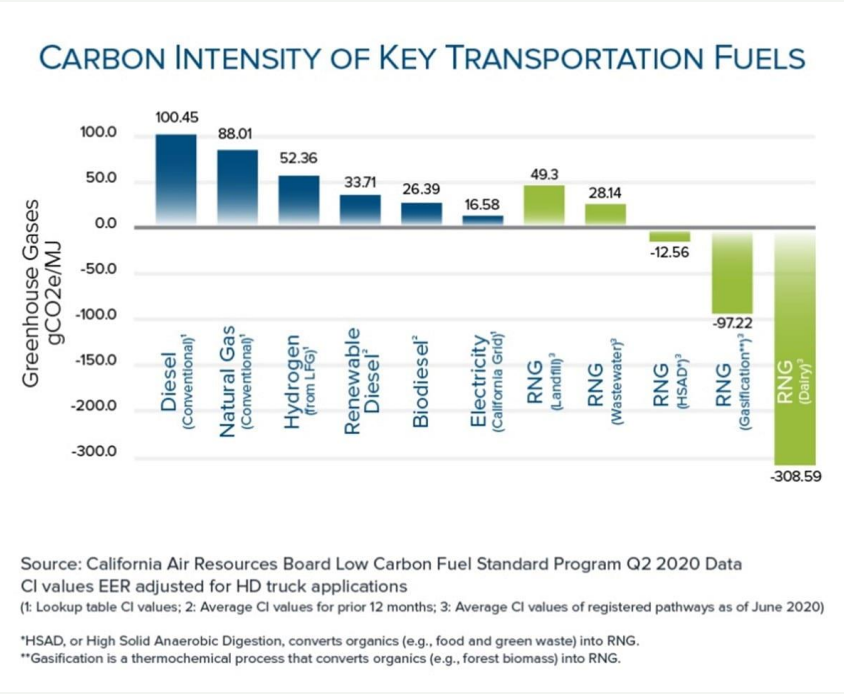
READINESS TO DELIVER

Perhaps the most compelling argument for RNG is its immediate deliverability via existing infrastructure—something that does not exist for other forms of renewables—a feature that enables seamless integration with natural gas pipelines. Biomethane produced from organic waste can be injected directly into natural gas pipelines and delivered to Canadians without the need for system changes or new infrastructure.

FortisBC already has ambitious goals to include RNG in their pipelines to existing customers. By 2025, FortisBC expects to have RNG contracts in place for roughly 10% of their total natural gas supply.

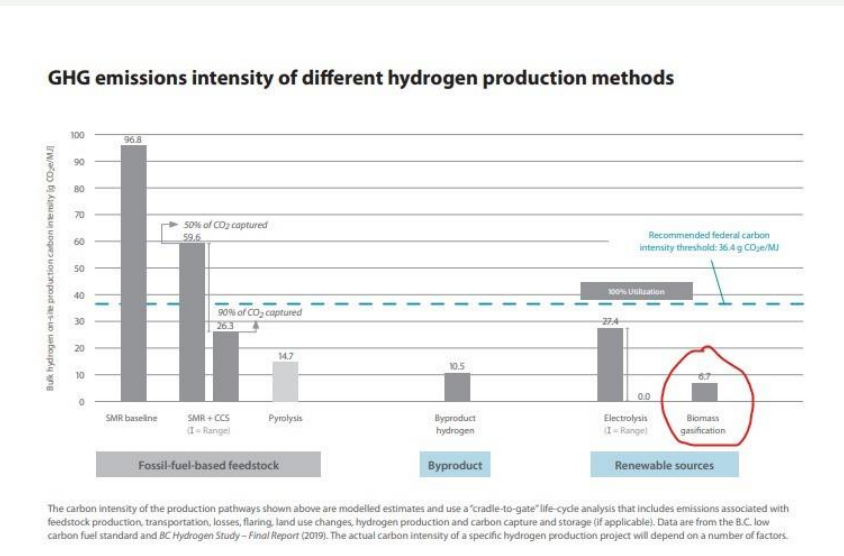


RNG offers low carbon intensity scores, making it a favourable option for reducing greenhouse gas emissions. RNG has a significantly lower carbon intensity score compared to conventional natural gas. If produced using renewable energy sources, the carbon intensity score of RNG can be further reduced. The tables below demonstrates this:



In fact, RNG’s CI score is calculated as negative— meaning that it reduces more emissions than it creates — as it is created by utilizing existing organic waste through the anaerobic digestion process. This process not only produces clean energy but also mitigates the environmental impact of waste.

By diverting organic waste from landfills and anaerobically digesting it to produce RNG, we effectively reduce the amount of waste that decomposes and releases harmful greenhouse gases into the atmosphere. Methane emissions, which are a natural byproduct of decomposing organic waste, are significantly reduced through this process. Methane is a potent greenhouse gas with approximately 25 times the global warming potential of carbon dioxide, as calculated over a 100 year period. But given the environmental tipping point of our atmosphere, the immediate impacts are more important to take into account, and therefore methane should be calculated as being 80 times more damaging. The reduction of methane emissions is a critical advantage of RNG.



NUTRIENTS



The circular economy aspect of RNG production is a crucial factor in its overall sustainability. Through the anaerobic digestion of organic waste, RNG production yields a valuable by-product called digestate. Digestate contains high levels of nitrogen, phosphorus, and other essential nutrients for plant growth.

By utilizing digestate as a fertilizer, we can displace the need for traditional fertilizers that are produced using fossil fuels. Conventional fertilizers contribute to greenhouse gas emissions during their production process. In contrast, digestate-based fertilizers support sustainable agriculture and reduce the environmental impact of traditional fertilizer production.

Furthermore, displacing fossil fuel-based fertilizers with digestate fosters a more sustainable approach to agriculture, reducing our dependence on non-renewable resources and promoting a greener, circular economy.

CONCLUSION

By embracing RNG as a clean energy source, we address multiple environmental challenges simultaneously: mitigating greenhouse gas emissions from organic waste, reducing reliance on fossil fuels, and promoting sustainable resource management practices.



About Andion – Company Overview

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Andion Company Overview

A PROVEN PLATFORM FOR EVERY ORGANICS- TO-RENEWABLE ENERGY PROJECT

ANDION Global (Andion Global Inc.) ANDION Global is an organics-to-renewable energy platform that develops every aspect of biogas projects, from inception to realization. Andion is dedicated to fueling a net-zero future by converting complex and variable organic wastes from a variety of sources – including urban centers and agricultural sites – to make renewable natural gas (RNG). The company's multidisciplinary team has over 20 years of experience delivering more than 50 biogas facilities to date. Headquartered in Vancouver, Canada, Andion Global has operations in North America, Italy and Sweden.



COMPANY HISTORY

Andion has its roots in Italy, where it gained more than 20 years of project expertise and European experience, developed through a combined total of installations at more than 50 Biogas plants worldwide. With ambitions to become a global presence, the company was reinvented and incorporated in 2017, when Andion's current CEO and Andion Global Inc. Founder, Phillip Abrary, saw an opportunity to import this operational legacy, and establish a base to expand the company into the North American market and beyond. Today, Andion has a leading team of mechanical, chemical and process engineers and biologists, as well as a leading executive team, to provide project development, proprietary technology development and engineering, construction and operation services.



Andion Company Overview

A LIST OF MOST RECENT ANDION PROJECTS

2022	Italy	Zinasco (PV)	Organic Solid Waste	BIOGAS PLANT
2021	Norway	Skogn	Organic Solid Waste	BIOMETHANE PLANT
2020	Italy	Aprilia (LT)	Organic Solid Waste	BIOMETHANE PLANT
2020	Italy	Rossano (CS)	Organic Solid Waste	BIOMETHANE PLANT
2020	Italy	Cisterna di Latina (LT)	Organic Solid Waste	BIOMETHANE PLANT
2020	Italy	Mozzate (CO)	Organic Solid Waste	BIOGAS PLANT
2019	Italy	Castellazzo (AL)	Organic Solid Waste	BIOMETHANE PLANT
2019	Italy	Mozzate (CO)	Organic Solid Waste	BIOGAS PLANT
2019	Ital	Piemonte	Organic Solid Waste	BIOMETHANE PLANT
2019	Italy	Caluso (TO)	Organic Solid Waste	BIOMETHANE PLANT
2019	Italy	Calcio (BG)	Organic Solid Waste	BIOMETHANE PLANT
2018	Italy	Melfi (PT)	Organic Solid Waste	BIOMETHANE PLANT
2018	Italy	Cairo Montenotte (SV)	Organic Solid Waste	BIOMETHANE PLANT
2016	Italy	Mozzate (CO)	Organic Solid Waste	BIOGAS PLANT
2016	Italy	Cairo Montenotte (SV)	Organic Solid Waste	BIOGAS PLANT
2015	Italy	Voghera (PV)	Organic Solid Waste	BIOGAS PLANT
2013	Argentina	Còrdoba	Organic Solid Waste	BIOGAS PLANT
2012	Italy	Zinasco PV	Organic Solid Waste	BIOGAS PLANT
2012	Italy	BO	Slaughterhouse	BIOGAS PLANT
2010	Belgium	Pittem	Organic Solid Waste	BIOGAS PLANT
2010	Italy	Vescovato CR	Slaughterhouse	BIOGAS PLANT
2008	Italy	Pegognaga MN	Slaughterhouse	BIOGAS PLANT
2008	Italy	Ospedaletto Lodigiano (LO)	Slaughterhouse	BIOGAS PLANT



Thank you

Please contact Andion at
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