Caeli

Carbon Emission Monitor

Decarbonization through satellite earth observation and advanced AI

Unlocking the power of satellite data

Caeli Amsterdam

Welcome to the satellite revolution in emissions monitoring.

At Caeli Amsterdam, our specialization lies in the transformation of intricate satellite data into accessible and comprehensible insights. We seamlessly integrate state-of-the-art satellite technology with advanced algorithms and machine learning models within our advanced infrastructure. This fusion of technologies empowers us to deliver invaluable insights, fostering a more sustainable, informed, and interconnected world.

Our commitment to unleashing the full potential of satellite data aligns with Caeli's overarching mission: to confront global challenges associated with climate change and air pollution. Through our cutting-edge satellite solutions, we actively pursue a sustainable future. We prioritize comprehending

and mitigating the impacts of climate change and advancing air quality, all in the pursuit of enhancing the well-being of our planet and its inhabitants. Our innovative solutions for improving air quality, combined with the sharing of vital insights, are instrumental in creating a worldwide impact, thus contributing to the creation of a cleaner and safer living environment.

Satellite Earth Observation, AI, and the Decarbonization of Industry Giants

Unlocking a sustainable future

In our rapidly evolving world, where the pursuit of sustainable practices and climate-conscious initiatives has become paramount, harnessing the power of cutting-edge technology is essential. Satellite Earth observation, combined with the power of artificial intelligence and machine learning, is leading the way in revolutionizing the understanding and decarbonization of large-scale industrial operations.

Across the globe, mining facilities, intricate supply chains, and colossal energy production facilities are often integral to the success of corporations. However, they are also significant contributors to carbon emissions, making them focal points in the battle against climate change.

This fusion of satellite Earth observation and advanced data analytics represents a paradigm shift in our ability to monitor, analyze, and influence the actions of these corporate giants. By leveraging satellite data and AI-driven insights, we gain an unparalleled vantage point from space, enabling us to scrutinize and optimize these operations with precision. We can track emissions, assess resource utilization, and facilitate sustainable decision-making.

By utilizing satellite Earth observation data and advanced AI algorithms, we can continuously monitor and present quarterly figures of carbon emissions from industrial facilities, providing timely and accurate insights into their environmental impact.

Our approach offers a distinct advantage by:
- Providing real-time updates on CO_2 trends, eliminating the 1.5 to 2-year lag.
- Offering granular measured data per asset versus reporting tailored to individual corporations.
- Mitigating the risk of greenwashing through the verification of satellite measurements, ensuring transparency and accountability.
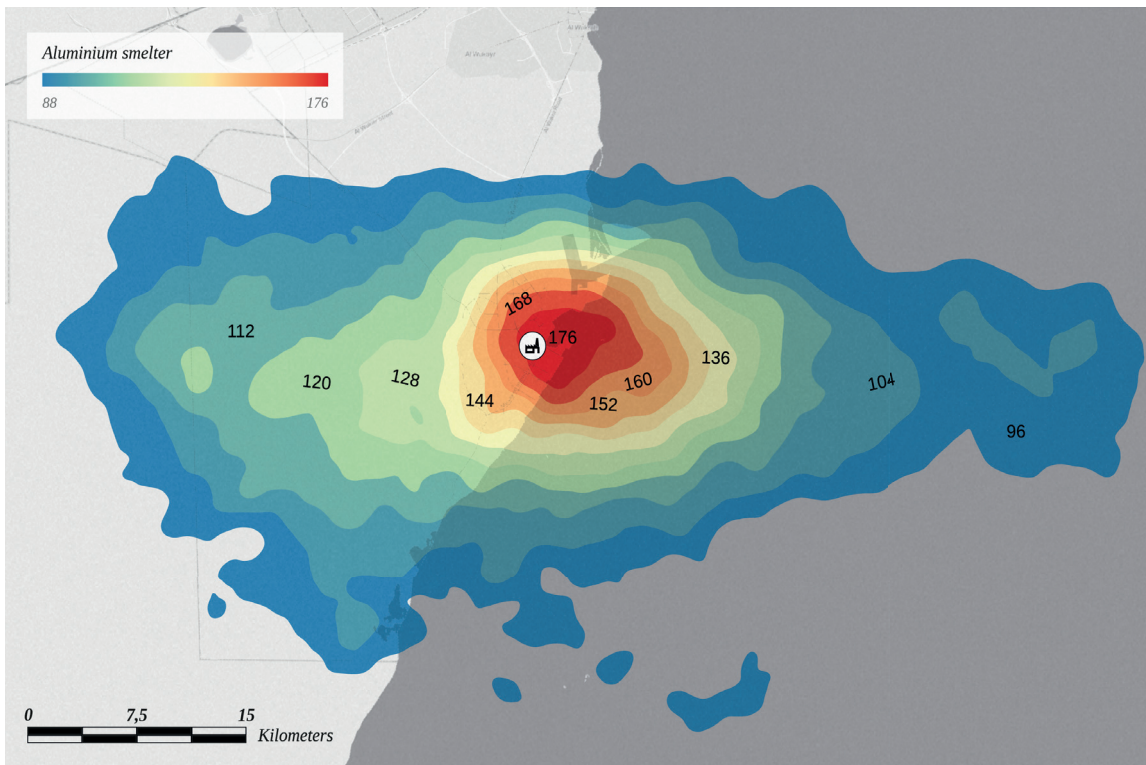
Image 1: Gradient contour map of CO$_2$ emissions from an Aluminium smelter we monitor.

On this page, you will find a series of visual examples that vividly illustrate our proficiency in tracking and analyzing CO$_2$ emissions. We offer diverse visualization options. From classic heatmaps, to more structured and simplified contour maps that categorize different areas of concentration. Our visualizations are meticulously designed to convey complex information in a comprehensible manner.

As you delve into the following images, you will witness the real-world applications of our technology, demonstrating our commitment to monitoring and addressing CO$_2$ emissions. These visualizations serve as a testament to our dedication to creating a cleaner and more sustainable future.
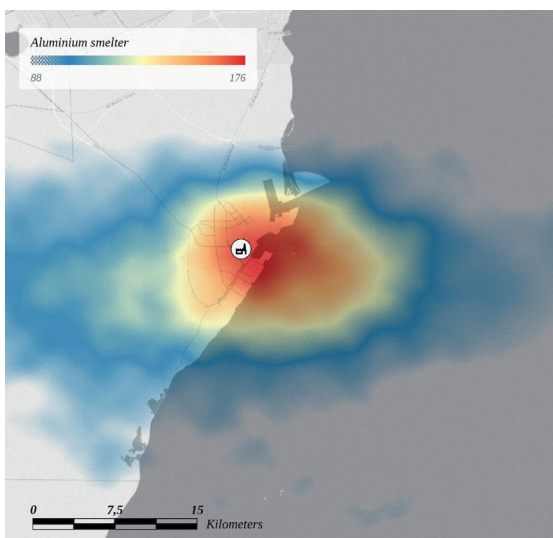

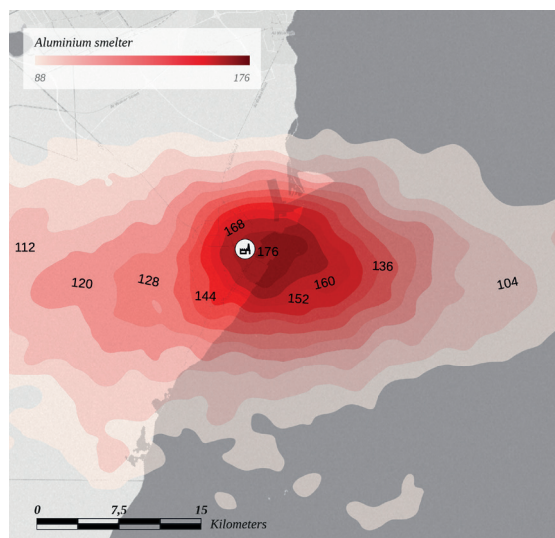*Image 2: Heatmap of CO$_2$ emissions from an Aluminium smelter.*

Image 3: Red contour map of CO$_2$ emissions from an Aluminium smelter.

Innovations in emissions monitoring with satellites

In a world increasingly committed to combating climate change and mitigating the adverse effects of industrial emissions, a groundbreaking technological synergy has emerged. The integration of satellite Earth observation data in combination with ground station data in robust machine learning models has ushered in a new era of environmental monitoring and insights generation, empowering us to tackle carbon emissions and other critical pollutants with unprecedented precision and efficiency.

At the heart of this transformation lies the ability to monitor and measure key gas and aerosol emissions with unmatched accuracy. The combination of satellite imagery and advanced data analytics enables us to scrutinize the atmosphere and the Earth's surface in ways that were once unimaginable. Among the critical emissions under surveillance are:

2.1: Nitrogen Dioxide (NO_2):
Nitrogen dioxide is a primary pollutant emitted from combustion processes, particularly from vehicles and industrial facilities. Satellite observation provides a holistic view of NO_2 levels across regions, helping to identify pollution hotspots and sources.

2.2: Sulfur Dioxide (SO_2):
Sulfur dioxide is a product of fossil fuel combustion, especially in power plants and refineries. Satellite data allows for the monitoring of SO_2 emissions on a global scale, aiding in the assessment of air quality and compliance with environmental regulations.

2.3: Methane (CH_4):
Methane is a potent greenhouse gas, and monitoring its emissions is vital for climate change mitigation. Satellite observation provides insights into methane release from natural sources and anthropogenic activities, such as agriculture and energy production.

2.4: Carbon Monoxide (CO):
Carbon monoxide is a hazardous air pollutant, originating from incomplete combustion processes. Satellite Earth observation allows us to track CO levels, providing early warning signs of potential health hazards.

2.5: Ammonia (NH_3):
Ammonia is a precursor to fine particulate matter (PM2.5) and is released from agricultural and industrial activities. Satellite data helps in monitoring NH_3 emissions and their impact on air quality and ecosystems.

2.6: Particulate Matter 2.5 (PM2.5):
Particulate Matter 2.5 represents one of the most significant and concerning air pollutants in our environment. These tiny, inhalable particles, measuring just 2.5 micrometers or smaller in diameter, pose serious health risks to humans and have far-reaching consequences for the planet. Satellite observation creates, together with the holistic of NO_2 detailed air quality insights.

The invaluable capability to capture, analyze, and interpret these emissions data is further complemented by a suite of tools and features that enhance its utility and accessibility:

Web Mapping

A user-friendly web portal allows stakeholders to access geospatial emissions data with ease. Users can view maps, analyze trends, and download data for further analysis or reporting.

Key Metrics

Live dashboards provide real-time insights into critical emissions metrics. These dashboards offer a dynamic, up-to-the-minute view of emissions data, enabling rapid response to changes in environmental conditions.

API Access

API's facilitate seamless integration of emissions data into existing systems or applications. This enables a wide range of industries and organizations to leverage emissions insights within their operations.

Monthly Subscription

Caeli's pricing model prioritizes accessibility and transparency, allowing organizations to subscribe on a monthly basis, thereby ensuring both affordability and flexibility.

Image 4: High-resolution insights into emissions on a global scale.

Caeli offers a revolutionary solution that combines satellite Earth observation, machine learning, and groundstations, representing a pivotal moment in the fight against climate change and environmental degradation. This integration equips stakeholders with the essential tools to track emissions, assess their impact, and drive effective decarbonization efforts, ushering in a sustainable and environmentally responsible future.

By seamlessly integrating these advanced technologies, Caeli overcomes the limitations of traditional monitoring methods, providing real-time, high-resolution insights into global emissions. This transformative approach ensures unprecedented accuracy and eliminates the significant time lags that hinder conventional monitoring.

Caeli's versatility extends across diverse industries and sectors, empowering energy producers, governments, and regulatory bodies with the data-driven insights needed to make informed decisions and drive positive change. Beyond emissions monitoring, it enables precise carbon accounting, sustainability reporting, and comprehensive environmental impact assessments, supporting ambitious emissions reduction goals.

Moreover, Caeli ensures transparency and accountability in emissions reporting, effectively mitigating the risk of greenwashing. Its verifiable accuracy not only fosters trust but also bolsters the credibility of corporations and institutions committed to sustainability.

In conclusion, Caeli's fusion of satellite Earth observation, machine learning, and groundstations represents a groundbreaking moment in the quest for a more sustainable future. It equips us with the indispensable tools to navigate the complexities of emissions, fostering a world where knowledge empowers change and environmental responsibility reigns supreme.

A new era of emissions tracking for asset managers and financial institutions

Empowering sustainable investment

In today's ever-evolving landscape of environmental sustainability and responsible investing, asset managers and financial institutions play a pivotal role in shaping a greener future. The journey toward achieving net-zero emissions and aligning portfolios with climate goals requires robust tools and insights to make informed decisions. Enter Caeli, the groundbreaking solution that empowers asset managers with unparalleled capabilities to monitor and track greenhouse gas (GHG) emissions for individual assets worldwide.

3.1: Precision emissions monitoring for informed investment:

Caeli's cutting-edge technology provides asset managers with the ability to gain real-time visibility into the GHG emissions of every asset within their portfolios, irrespective of geographical boundaries. This unprecedented level of detail and accuracy empowers you to make data-driven decisions that align with your sustainability objectives.

3.2: Mapping emission sources globally:

Understanding the exact locations and sources of emissions is essential for devising effective mitigation strategies. Caeli equips you with the geospatial data and mapping tools necessary to pinpoint emissions sources, enabling you to take targeted action where it matters most.

3.3: Quarterly CO_2 trendlines in tandem with corporate reporting:

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3.4: Uncovering emission hotspots across industries

From power plants to steel factories, mining operations, and fertilizer production facilities, Caeli enables you to monitor emissions per asset across a wide range of industries. This holistic view allows you to identify and engage with companies that are actively addressing their carbon footprint and those that require intervention.

As asset managers, you hold the key to driving meaningful change in the corporate world. By leveraging Caeli's capabilities, you can engage with portfolio companies on a deeper level, ensuring they are on track to meet their emission reduction targets and contributing to a sustainable future.

Pioneering a sustainable future

Revolutionizing emissions monitoring for asset managers worldwide with enhanced capabilities and insights.

Image 5: Sentinel-4 will cover the need for continuous monitoring of atmospheric composition. (*Source: Eumetsat)*

In the quest for a more sustainable and environmentally conscious future, the power of technology has become our greatest ally. The ability to monitor and mitigate greenhouse gas (GHG) emissions with unparalleled precision has taken a giant leap forward with the advent of cutting-edge satellite technology. And at the forefront of this revolution stands Caeli, poised to harness the capabilities of these next-generation satellites and set new standards in emissions analysis and environmental stewardship. As we journey toward a greener tomorrow, Caeli remains steadfast in its mission to drive innovation and sustainability, paving the way for a greener future for generations to come.

4.1: The Sentinel 4 breakthrough:

In early 2024, the global emissions monitoring landscape will be forever transformed with the launch of Sentinel 4, a geostationary satellite designed to measure a wide range of pollutants. This pioneering satellite will provide an unprecedented level of detail, enabling us to monitor emissions sources in real-time, anywhere on Earth.

4.2: Expanding the satellite arsenal:

The satellite constellation dedicated to emissions monitoring is growing, with existing satellites like OCO 2 and 3, as well as the emergence of new ones. These advanced platforms promise a wealth of

data that can be harnessed to gain deeper insights into emissions trends, identify sources, and track progress towards global climate goals.

4.3: Caeli's readiness for the future:

What sets Caeli apart is our unwavering commitment to staying at the forefront of technological advancements. We are not merely adapting to the influx of new satellite data; we are ready to lead the charge. Our analytical capabilities are designed to seamlessly integrate and process data from these new satellites, ensuring that we remain ahead of market demands and client expectations.

4.4: Analyzing the new datasets:

As the satellite landscape evolves, so does our ability to analyze emissions data with greater accuracy and granularity. Caeli's state-of-the-art machine learning algorithms and data processing pipelines are agile and adaptable, enabling us to rapidly incorporate and derive insights from the datasets provided by these cutting-edge satellites.

4.5: Anticipating emerging market needs:

The emissions monitoring landscape is dynamic, with ever-evolving regulatory and industry standards. Caeli's proactive approach ensures that we are ahead of the curve in meeting emerging market needs. We understand that the demand for timely, accurate, and comprehensive emissions data will continue to grow, and we are well-positioned to deliver on those expectations.

4.6: Empowering environmental stewardship:

Caeli's readiness for the satellite revolution extends beyond technology; it speaks to our dedication to environmental stewardship. We recognize the urgent need to combat climate change and drive sustainability efforts across industries. By equipping our clients with the most advanced emissions insights, we empower them to make informed decisions and drive positive change.

Image 6: The OCO-2 satellite. The Orbiting Carbon Observatories satellites are NASA missions designed to monitor and study carbon dioxide (CO_2) levels in Earth's atmosphere. (*Source: NASA*)

4.7: A bright future for emissions monitoring:

The future of emissions monitoring is illuminated by the light of innovation and technological progress. Sentinel 4 and the upcoming satellite launches represent a quantum leap in our ability to understand and address GHG emissions. Caeli is proud to be at the vanguard of this transformation, shaping the future of environmental responsibility.

Monitoring emissions for a greener tomorrow

In an era where environmental consciousness is not just a goal but a necessity, Caeli stands as a beacon of hope. We are ready to embrace the data-rich future that advanced satellites promise, leveraging their capabilities to drive sustainability, reduce emissions, and secure a healthier planet for future generations.

Together, we embark on a transformative journey of discovery and action—a journey that will redefine the way we monitor and combat climate change. With Caeli as your trusted partner, you have the assurance that you are equipped with the best tools and insights to shape a more sustainable, resilient, and prosperous future for all. Welcome to the satellite revolution in emissions monitoring, where innovation meets sustainability, and our commitment to preserving the environment knows no bounds

Carbon Emissions Monitoring by Caeli

Contact us

Seeking further information or curious about our products? Feel free to get in touch with us through the contact options provided on our website or via email below.

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