Global Energy Monitor

globalenergymonitor.org

# Annual Report 2024

## Empowering a clean energy future

# LETTER FROM THE EXECUTIVE DIRECTOR

**Ted Nace**
**Executive Director**

Since its founding in 2007, GEM has gone through several distinct phases. For the first few years, as CoalSwarm, the organization worked to develop reference information on coal in the United States, in support of a nationwide movement that sought to block 151 proposed coal plants. In 2015, CoalSwarm extended its work to the international stage, releasing the Global Coal Plant Tracker, a fully open informational resource that was soon put to use by a growing array of civil society, governmental, and business organizations to support a wide range of energy transition work.

In 2018, CoalSwarm changed its name to Global Energy Monitor, and the organization began rapidly applying its tracker methodology to additional sectors and topics: oil and gas, renewable energy, heavy industry, and methane. Increasingly, GEM data users have requested new trackers that combine information on multiple sectors. In 2024, GEM answered this call by releasing three important new tools: the Global Integrated Power Tracker, which combines data from GEM's eight power sector trackers into one convenient tool; the Global Energy Transition Tracker, which provides an open platform for information and data on over twenty "iconic zones" that are critical to the energy transition; and the Global Energy Ownership Tracker, which offers in-depth information on the chain of ownership for thousands of energy projects.

In addition, GEM widened its offerings on several fronts, including an expansion of the Global Solar Power Tracker to include solar farm phases in the 1–20 megawatt (MW) range, a new Global Iron Ore Mines Tracker, a revamped Africa Energy Tracker, and an updated Private Equity Energy Tracker. Besides these new initiatives, GEM released updates for dozens of trackers, as well as over 36 reports and briefings.

Behind all this activity is an amazing team of staff, funders, and partners, united by the common mission of providing the open and accessible information that is essential to build a sustainable energy future.

GEM stands at the crossroads of two powerful movements. One is the open information movement, characterized by Creative

# LETTER FROM THE EXECUTIVE DIRECTOR

Commons licensing and collaborative research platforms. The other is the "soft energy" or "clean energy" movement, which seeks to accelerate the transition from a fossil economy, characterized by large and increasingly uneconomical power plants, to a decentralized energy system built on renewable sources.

One of the earliest articulations of the benefits of decentralized renewable energy was Amory Lovins, whose 1976 article Energy Strategy: The Road Not Taken? created the intellectual framework for much of the energy transition work that followed. In 1982, Lovins established the Rocky Mountain Institute to bring these transformational ideas into the mainstream.

I have long admired Rocky Mountain Institute (now RMI) for its pioneering work and its incredible team. As I retire this year, I'm thrilled to welcome Justin Locke, who comes to GEM as its new executive director after a decade of successful service at RMI.

With a background at the United Nations Development Programme and the World Bank, Justin began at RMI in 2014 as founder and director of RMI's Islands Energy Program, which laid the roadmap and execution plans to develop fossil-to-clean transitions for the Caribbean region where the economics to achieve full transition to renewables were arguably clearer than any other region in the world. He then went on to become a senior director, co-leading RMI's Clean Economies Program that covered the Caribbean, the Pacific, and sub-Saharan Africa. For the past four years, Justin has been the managing director for RMI's Global South portfolio, where he expanded RMI's footprint into Southeast Asia and new programmatic areas, such as climate finance access and clean energy workforce development.

In addition to his deep familiarity with the challenges of the energy transition, Justin's background as a builder of diverse global teams and partnerships makes him a perfect fit for GEM, which sees itself as a service organization working to support thousands of local, regional, and global partner organizations across the energy transition ecosystem.

In signing off as executive director, I feel a great sense of pride in the community of hard-working and creative people who have come together at GEM to advance this mission. I feel confident that GEM will continue to play a vital role in building a sustainable energy future.

## GRATITUDE FOR TED'S LEADERSHIP

# After nearly two decades of visionary leadership, Ted Nace is stepping down as Executive Director of Global Energy Monitor.

Ted's tireless work has positioned GEM as a trusted source of open-access energy data, and the impact he has had on climate transparency and accountability will be long-lasting.

Under Ted's leadership, GEM evolved from a bold idea into **a global nonprofit documenting more than 130,000 energy assets and producing some of the world's most widely used tools on coal, oil, gas, renewables, and heavy industry.** His vision and dedication have established GEM as a leading voice in the movement for clean energy — trusted by governments, media, academics, and advocates worldwide.

Honoring Ted's legacy, GEM remains committed to the values that have shaped the organization from the start: independence, transparency, and a commitment to providing high-quality, publicly accessible data. These principles will continue to guide our work — and will carry us forward as we grow to meet the challenges of a fast-changing energy landscape.

# Our Mission

## MISSION

Global Energy Monitor develops and analyzes data on energy infrastructure, resources, and uses. We provide open access to information that is essential to building a sustainable energy future.

## THE CHALLENGE

We want the world's problem solvers to have tools they need to build a sustainable future. But for too long, subscription services and fossil-fuel interests have controlled the world's energy information.

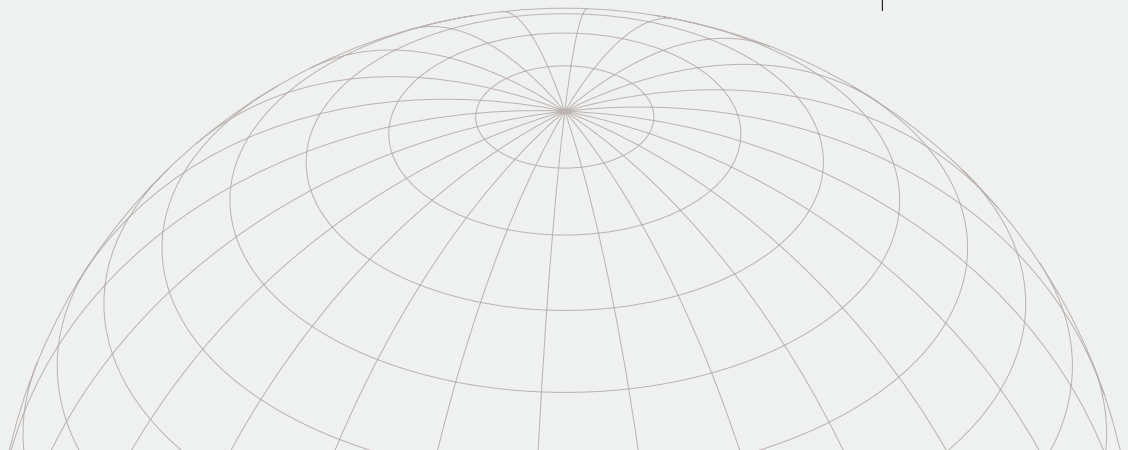
**87 people**

**13 countries**

We believe it is vital that information on the global energy system — a bedrock of modern political economies and societies — is out in the open.

That's why we're building a model for the future: trusted, high-quality information on the global energy sector that is free for everyone and maintained by a civil society organization.
We set ourselves the mission to develop and analyze data and information on energy infrastructure, resources, and uses, because we want to make the world's complex energy system accessible.

GEM aspires to become the "gold standard" of end-to-end energy data. By creating and sharing an accurate picture, we empower our users and ensure public accountability through transparency.



# 2024 at a Glance

As a data organization, we know numbers can tell an important story. Here are just a few of the numbers that illustrate a slice of the impact that our work has had in the last year.

### POWER SECTOR ASSETS TRACKED

↑ **115,946**

→ 2023: 80,487

### ENERGY INFRASTRUCTURE AND HEAVY INDUSTRY ASSETS TRACKED

↑ **22,979**

→ 2023: 17,310

### MEDIA CITATIONS

↑ **7,860**

### ACADEMIC CITATIONS

↑ **642**

→ 2023: 482

### VISITORS TO GEM.WIKI

↑ **5.1 million**

→ 2023: 2.0 million

### TRACKER DATASET DOWNLOADS

**~25,000**

→ 2023: ~14,000

### NEWSLETTER SUBSCRIBERS

↑ **16,045**

→ 2023: 9,796

### SOCIAL MEDIA

↑ **292,170**

### SOCIAL MEDIA ENGAGEMENT

↑ **20,890**

### TOTAL FOLLOWERS ACROSS

↑ **12,939**

# Who uses GEM data

**Each year hundreds of organizations from all sectors working on the energy transition rely on GEM's best-in-class data to inform their efforts. Here are a few examples of GEM data in action in 2024.**

This map shows the breadth of reasons that people download GEM's data, in various sectors across 200 countries and regions.

In each of these cases, someone sought a path to understand how an aspect of the energy sector is impacting their goals – to decarbonize, to clean up their environment, or to facilitate equity in the energy transition. Detailed, open, granular data was the key to that understanding, and it wouldn't have been possible without GEM. Together, these stories create a picture of the far-reaching impact of GEM's data on the energy sector.

# Who uses GEM data

→ **Carnegie Mellon University in the US** found the data in the **Global Iron and Steel Tracker** useful for "research on the impact of policies towards climate neutral steel investments."

→ **A resident of Pennsylvania** concerned about air quality found the **Global Coal Plant Tracker** useful "to know what is in the air that my family and I are breathing."

→ **The UK Department for Energy Security and Net Zero** used the Global Coal Mine Tracker to understand "what areas are dependent on both mining and power jobs."

→ **The International Energy Agency in Paris** relied on the **Africa Gas Tracker** "to develop clean energy value chains by quantifying existing gas networks" across the continent.

→ **The National Utility of Malaysia** relied on the **Asia Gas Tracker** to model "scope for growth of renewable energy assets."

→ **Indonesia's Institute for Essential Services Reform,** conducted "public policy advocacy for better methane emissions monitoring regulation" with data in the **Global Methane Emitters Tracker.**

→ **The US Environmental Integrity Project** applied data from the **Global Oil and Gas Plants Tracker** "to estimate the potential environmental impacts of just proposed gas-fired power plants in Texas."

→ **The World Economic Forum in Davos** used the **Global Coal Project Finance Tracker** "to inform country prioritisation exercise for a coal retirement project."

→ **The Ministry of Energy and Infrastructure, United Arab Emirates,** leveraged the **Global Nuclear Power Tracker** "to contribute to a research paper aimed at improving sustainable energy practices."

→ **Academics at the University of Queensland in Australia** took data in the **Global Solar Power Tracker** to map the "intersection with Indigenous people's water rights."

# Program Highlights

- HEAVY INDUSTRY
- RENEWABLES & OTHER POWER
- COAL
- OIL & GAS

# Heavy Industry

**Caitlin Swalec**
Heavy Industry Program Director

Progress towards the decarbonization of heavy industry in 2024 experienced mixed results. Growing political momentum and campaign developments led to a significant increase in the volume of green technologies under construction. But carbon dioxide emissions from iron and steel continued to increase, as did coal-based production capacity. COP29 brought little attention and limited progress to the climate targets guiding the sector, and a phaseout of coal in the G7 nations failed to address the use of metallurgical coal in steelmaking. Many of the new green technology and decarbonization projects were also delayed or rolled back as the global hydrogen bubble deflated.

Against this backdrop, GEM's heavy industry program is more important than ever, providing open and transparent tracking of these industries, and enabling accountability and strategic efforts towards climate action. In 2024, GEM released the third

annual update of the Global Steel Plant Tracker (now rebranded as the Global Iron and Steel Tracker), which documented 95% of global steel production (based on OECD estimates). GEM introduced unit-level blast furnace relinings and provided more details on direct reduced iron technologies and electric arc feedstock furnaces. GEM's coverage of these technologies helps improve emissions estimates while calling for higher ambitions in climate commitments. GEM also launched the Global Iron Ore Mines Tracker in November 2024, which provides greater insight into the raw materials supply chain that is critical for iron and steel production.

PROGRAM HIGHLIGHTS

# Heavy Industry

GEM's heavy industry data continued to be used as foundational sources for key decarbonization tools, including Climate TRACE's global emissions inventory, LeadIT's Green Steel Tracker and Green Cement Technology Tracker, Agora Industry's Global Steel Transformation Tracker, and Industrious Labs' Industrial Facilities Tracking Tool.

We also made new inroads with key geographies by becoming an active member of the India Green Steel Network and by hosting a fellow from the National Committee on U.S.-China Relations. Through this network, GEM is helping to shape civil society's strategy for steel decarbonization in India, and by working with a researcher in China, GEM was able to review our data against the Global Infrastructure Emissions Detector database (GID model) from Tsinghua University and confirm that our data is more complete and accurate for China's iron and steel sector. With India and China being two of the world's leading consumers of fossil fuels, these partnerships present opportunities to advance significant progress toward decarbonization and pollution reduction, and GEM is thrilled to have a hand in them.

## CASE STUDY
## CONNECTING A GLOBAL COMMUNITY OF DATA-DRIVEN ADVOCATES

GEM continues to sponsor the Steel Data Network, a vibrant and growing community of over 150 researchers and campaigners from more than 80 institutions worldwide. Convening quarterly, the network fosters collaboration on data transparency, measurement and analysis, and policy development to advance industrial decarbonization, particularly in the steel sector. If current developments and retirements proceed, the global fleet could just about reach IEA's target for converting to the less-polluting electric arc furnace method of steelmaking—a key benchmark for greening one of the world's most polluting industries. Read more in Pedal to the Metal 2025, GEM's annual survey of the global iron and steel plant fleet.

Since its founding by GEM in 2021, the network has become a central hub for coordination and knowledge-sharing and has inspired regional initiatives like the North America Steel Group, European Steel Network, and India Green Steel Network. Building on this model, GEM is now working to establish a similar data network for the cement and concrete sector, another critical high-emissions industry where coordination is needed for decarbonization.

# Renewables and Other Power

**Jessie Cato**
Renewables & Other Power Program Director

If there was one renewables story in 2024, it was the solar rush. Last year, the renewable energy industry outperformed even the rosiest forecasts. China added 277 gigawatts of new solar capacity, more than all of the solar operating in the U.S.

Europe also provided a sturdy backbone to the energy transition. Offshore wind held firm and expanded in the North Sea through the UK, Germany, and Denmark. Spain emerged as the poster child in kickstarting a just energy transition, building one of Europe's fastest-growing renewables portfolios. Local innovation also continued to shine, such as in Pakistan, where local developers wired up rooftops and hit their capacity targets in months instead of years.

At GEM, the Renewables and Other Power program mirrored the sector's global surge. User data downloads increased over three-

quarters compared to the year before. Programmatic impact stretched beyond clicks, with agenda-setting insights deployed at key moments, like the extensive media coverage for our topline findings about the solar and wind buildouts underway across China and Southeast Asia.

Renewable energy is innovative by nature, and so is GEM's program. Last year we furthered our impact through partnerships. TransitionZero trained its machine learning model using GEM data and published quarterly updates in 2024. The Global Solar Power Tracker incorporated these outputs to enhance its coverage down to projects with a capacity of just 1 MW. For the first time,

# Renewables and Other Power

we worked with local partners REScoop and the Electra Energy Cooperative to highlight case studies of community ownership for solar and wind projects across the Western Balkans.

This deep data work helped lay the foundation for real-world impact. The program's insights into Spain's energy transition helped support the work of a new local think tank in Catalonia and its initiatives to secure regional renewables policies. In India, GEM's hydropower data supported in-depth field reporting on the local impacts of infrastructure development in rural Himalayan communities. Our data and the team behind it continued to drive the conversation on the impacts of the climate crisis, including reporting by The New York Times on drought-limiting hydropower.

The critical importance of this data as a foundation for the global climate conversation was also evidenced in its use across stakeholders, including supporting research in academic journals such as Nature, publications including Science, and in the IEA's World Energy Outlook.

As we move forward in 2025, the program is working closely with key partners to ensure that our research continues to support the just transition toward renewable energy.

## CASE STUDY
## ENSURING ACTION AGAINST CLIMATE CHANGE IS LEGITIMATE

Together with our partner Solutions For Our Climate, we leveraged data in the Global Bioenergy Tracker to analyze the country's Renewable Energy Certificates (REC). The REC subsidies provided woody biomass burning units with higher RECs weightings than solar or offshore wind, despite the fact that these can emit up to 30% more emissions than coal burning and contribute to deforestation through their necessary use of wood pellets. Within four months of the publication of our analysis, the South Korean government ended those incentives on the account of "national and international criticism" over deforestation.

# Coal

**Flora Champenois**
Coal Program Director

Coal is often dismissed as a fuel of the past. But after a brief pandemic-era dip, it has proven resilient, buoyed by a global gas crunch, surging electricity demand, relentless heatwaves, and entrenched fossil fuel interests. Last year was widely expected as a symbolic turning point for coal. Instead, production, trade, and coal-fired power capacity and generation all reached record highs as coal continues to round the corner.

GEM's coal program provides the data and evidence base on the infrastructure driving these trends, from power plants burning coal to the mines and export terminals feeding them and the methane they emit. In 2024, we expanded and refined these datasets, adding planned retirement history and conversion details to the Global Coal Plant Tracker, providing historical production data for the Global Coal Mine Tracker, and beginning research on coal mine methane mitigation measures and gassiness indicators.

We also scaled up our methane work. GEM now represents NGOs within the United Nations International Methane Emissions Observatory Advisory Council, helping to ensure civil society has a seat at the table as methane policies and reporting mechanisms take shape. We co-launched a new data network for NGOs working on methane from coal mines to boost collaboration and continued enhancing the Global Methane Emitters Tracker's coverage of fossil fuel-related methane.

As coal slowly declines, urgent questions arise about the workers and communities who depend on the industry. In 2024, we launched a collaboration between the Global Coal Mine Tracker

# Coal

and the Global Energy Transition Tracker, providing stories of renewable energy potential on abandoned mine lands, in order to generate momentum and visibility for a just energy transition.

The energy transition is underway, but not fast enough. Global coal mine output is on the rise again, and while rich countries are stepping back from new coal retirements, they must more than triple by 2030 to align with the Paris Agreement. With China and India now responsible for virtually all new capacity under development, a key finding of GEM's Boom and Bust Coal 2025 report that was widely publicized by international media, decisions made in Beijing, New Delhi, and beyond will shape global outcomes.

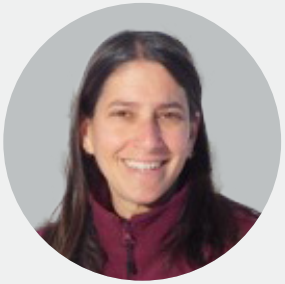
That reality makes timely, data-driven decisions more urgent than ever. The coal program and its partners will continue to spotlight these choices and their consequences. Because in the race to phase out coal, transparency is power.

## CASE STUDY
## MAKING VISIBLE THE PROBLEM OF COAL MINE METHANE

While global efforts to mitigate methane emissions — a potent greenhouse gas with more than 80 times the warming potential of carbon dioxide over a 20-year period — have long focused on oil and gas, GEM helped elevate coal mine methane as a critical and long-overdue priority for mitigation at COP28 and beyond.

In 2024, GEM's first-of-their-kind analyses on mine-linked super-emitter events and the overlooked threat of abandoned mine methane garnered attention across Türkiye, Poland, the Czech Republic, China, Australia, and other key regions. A U.S. Embassy Beijing staffer called GEM's China's Coal Conundrum report "extremely informative," particularly as they track China's energy transition and its emissions implications. Globally, stakeholders—from the International Energy Agency (in the Global Methane Tracker and World Energy Outlook 2024) to the Environmental Defense Fund—relied on GEM's data on mine depth, type, and emissions to inform policy analyses and investor engagement materials.

# Oil and Gas



**Julie Joly**
Oil & Gas Program Director

For a fleeting moment in 2024, oil and gas appeared to backslide. In an effort to remain a part of the energy transition conversation, fossil fuel companies chased unproven solutions to cut emissions, like carbon capture and storage and hydrogen-ready gas infrastructure. But the respite was short lived, as gas demand again began to surge across every region of the globe, and project developers bet on the energy needs of new technologies like artificial intelligence.

GEM's meticulous tracking and augmentation of data across the entire oil and gas supply chain continue to be essential for the clean energy movement to counter these setbacks. Indeed, as the UN's climate action team has said, this work "is a tremendous resource" to the global fossil fuels phaseout.

Upstream, extraction data featured a number of improvements in order to align with partners' needs. For example, changes to how we identify field operators have helped RMI in developing emissions estimates for Climate TRACE, the global coalition building a timely, open, and accessible inventory of exactly where greenhouse gas emissions are coming from.

Our pipeline routes continue to advance, with refined mapping allowing users to better understand potential impacts of pipelines and other infrastructure on local ecosystems and communities. Non-gas liquid pipeline data have been particularly important in

# Oil and Gas

the U.S. for campaigners interested in targeting the petrochem/plastics industry.

For downstream infrastructure, gas turbine data now include make and model information, which has been a boon for campaigners and media alike. In addition, we partnered with the Beyond Fossil Fuels coalition in Europe to help launch their new gas-fired power plant tracker, which relies on GEM data.

Our work on the regional level also provides a critical backstop for information on gas. An analysis about gas infrastructure across Europe provided one of the most comprehensive evaluations to date of hydrogen developments in the sector, helping to deflate over-optimistic hype. Partners continue to build off GEM's gas data to underpin their own initiatives, like Food and Water Action's LNG Threat Map. Overviews in Asia and Africa provide stakeholders monitoring those areas with developments that are otherwise out of reach.

To complete the oil and gas picture, our weekly news bulletin, Inside Gas, summarizes the most significant developments affecting the global gas industry and highlights the efforts of groups and communities around the world working on gas-related issues. As one reader put it: "Inside Gas is not just professionally produced. I find stories otherwise missing and perspectives that manage to marry the needs of climate activism with insight into industry thinking and actions."

**CASE STUDY**

## LAYING THE FOUNDATIONS OF INTERNATIONAL PLANNING AND NEGOTIATIONS

The reason we collect the data we do is ultimately to support the global climate movement in achieving a just energy transition. One high-level forum where this plays out is at the United Nations. The Secretary-General's Climate Action Team leads an annual review of GEM's power sector data to help inform its strategies.

# Our People

**GEM is the sum of its parts — approximately 90 staff spanning thirteen countries and 28 U.S. states — and our People and Culture department works to listen, engage, and activate voices across our global organization to ensure all identity groups and perspectives are represented in our work.**

In 2024, GEM introduced a paid employee medical and gender-affirming care policy, as well as a responsible investment policy, adding fourteen new socially responsible fund options for staff to invest their retirement funds in. Our first training and development program included nine in-house training sessions on various technical topics such as writing, literacy in project management, and advanced mapmaking software, with staff participating in over 90 personal development opportunities, including conferences and certification courses.

Our second biennial staff retreat brought employees together in person for a week of team-building and rest, and our culture-building initiative hosted 56 activities in 2024, including yoga and wellness sessions, coworking opportunities, and environmental justice-focused lunch and learn discussions.

Our aspiration is to foster a diverse work environment and encourage women, LGBTQIA individuals, people of color, people with disabilities, older members of the community, ethnic minorities, foreign-born residents, and others from minority groups and diverse backgrounds to apply. We designed our hiring process to foster an inclusive and welcoming experience, with the aim for candidates to feel respected, appreciated, and comfortable, thereby creating the conditions for both GEM and the candidate to determine if there is a good fit.

# Financial Overview

| | | 2024 | 2023 |
|---|---|---|---|
| **ASSETS** | → Cash and cash equivalents | 2,919,873 | 2,126,114 |
| | → Contributions receivable | 2,663,560 | 3,461,828 |
| | → Refundable deposits and advances | 183,061 | 187,604 |
| | → Prepaid expenses | 33,430 | 82,313 |
| | **TOTAL ASSETS** | **5,799,924** | **5,857,859** |
| **LIABILITIES** | → Accounts payable and accrued expenses | 351,409 | 325,682 |
| | → Accrued paid time off | 527,476 | 447,223 |
| | **TOTAL LIABILITIES** | **878,885** | **772,905** |
| **NET ASSETS** | → Without donor restrictions | 1,157,687 | 912,833 |
| | → With donor restrictions | 3,763,039 | 4,172,121 |
| | **TOTAL NET ASSETS** | **4,921,039** | **5,084,954** |
| **TOTAL LIABILITIES AND NET ASSETS** | | **5,799,924** | **5,857,859** |

# Expense breakdown by category

**SALARIES**
→ $7,405,313.24

**EMPLOYEE BENEFITS**
→ $822,124.51

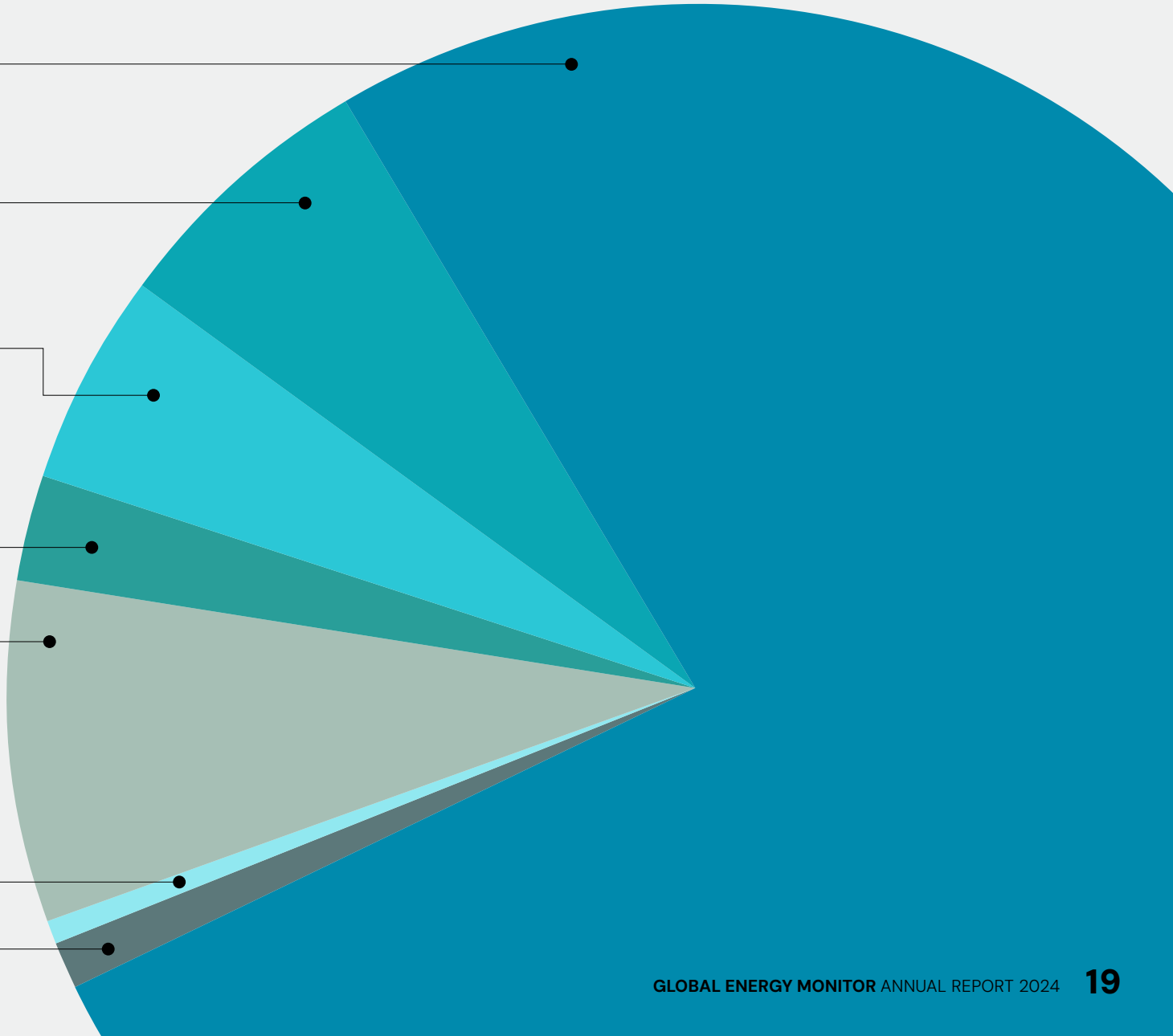
**PAYROLL TAXES**
→ $496,960.95

**OTHER PERSONNEL COSTS**
→ $210,052.85

**MISC. PROFESSIONAL SERVICES**
→ $ 400,131.11

**MISC. OPERATING COSTS**
→ $341,802.39

**GRANTS**
→ $100,000.00



# With Gratitude

## GEM is grateful for the financial support provided by all of the organizations that empowered our work in 2024.

To learn more about how your foundation or company can support GEM's vital services to the energy transition movement, contact Ash Ganguly, Development Manager.

Bloomberg Philanthropies

climate:imperative

CLIMATE TRACE

climateworks FOUNDATION

European Climate Foundation

Ford Foundation

Global Methane Hub

GROWALD CLIMATE FUND

Pooled fund on International Energy

Quadrature Climate Foundation

**and many more aligned funders**

* Note: The European Climate Foundation has supported GEM for the Europe Gas Tracker project. The responsibility for the information in this tracker and related analyses lies with GEM. The European Climate Foundation cannot be held responsible for any use which may be made of the information contained or expressed herein.