LETTER FROM THE EXECUTIVE DIRECTOR

Accomplishing the rapid decarbonization of the world’s energy system is arguably humanity’s most ambitious and critical project ever attempted. Bringing it about requires mobilization and action at all levels, from citizen groups and academic institutions to large corporations and governments. In order for action at any level to be effective, stakeholders need a shared base of open and accurate data on the individual elements of the energy system. Beginning with the Global Coal Plant Tracker in 2014, Global Energy Monitor (GEM) has steadily built a world-class ensemble of 22 open-source datasets on energy assets. These serve as essential movement infrastructure to accelerate the worldwide clean energy transition spanning renewable energy, coal, heavy industry, and oil and gas.

GEM plays a key strategic role as part of multiple networks of non-governmental organizations (NGOs) that are campaigning on specific aspects of the global energy system to accelerate the transition to clean energy. GEM’s maps, tracker data, briefings, wiki-style pages, webinars and newsletters have helped provide an essential information foundation, and GEM’s analyses have helped shape campaign narratives. In addition, GEM serves as a service provider, offering direct support to funders and NGO partners as resources permit.

Beyond the NGO networks at the core of GEM’s work, GEM supports a growing constellation of individuals and other organizations, including reporters, academic researchers, government agencies, trade associations, labor unions, financial institutions, and businesses aligned with the energy transition.

None of this would be possible without the dedicated efforts of GEM’s staff, who bring a multiplicity of talents to their work: research, analysis, project management, data engineering, and administrative expertise. I’m proud of the energy, precision, resourcefulness, and teamwork that all GEM staff bring to their work, each and every day. They’re united by their dedication to the principle of open information and by a stubborn belief that informed action can make a difference in addressing the climate crisis. It is an honor and a privilege to be part of such an inspired and committed group.

Sincerely,
Ted Nace
Our mission is to develop and analyze data on energy infrastructure, resources, and uses. We provide open access to information that is essential to building a sustainable energy future.

With 87 staff in thirteen countries around the world, we advance this mission by providing research and data insights, tools, visualizations and mapping through collaboration with a growing audience of users at nonprofits, governmental agencies, media organizations, academic institutions, businesses, and philanthropies worldwide.
GEM collaborates with a range of initiatives

→ Climate TRACE global emissions inventory
→ Bloomberg Global Coal Countdown
→ Southeast Asia Information Platform for the Energy Transition (SIPET)
→ Carbon Tracker’s Global Registry of Fossil Fuels
→ Ember’s Global Electricity Review
→ Uurgewald’s Global Coal Exit List and Global Oil and Gas Exit List
→ Beyond Fossil Fuels
→ Asset Impact’s Physical Assets Matched with Securities (PAMS) database
→ Center for Global Sustainability at the University of Maryland’s “State of Global Power” factsheet series

→ Global Energy Transition Tracker (GETT) and 350.org
→ Transition Zero’s Global Steel Cost Tracker and Solar Asset Mapper
→ The Leadership Group for Industry Transition (LeadIT) Green Steel Tracker
→ Agora Energiewende’s Global Steel Transformation Tracker
→ Net Zero Industry’s Net Zero Steel Project
→ Research Network on Industrial Decarbonisation (RENEW–Industry)
Our global lens

GEM data insights and analyses like these help inform a critical discussion and action on the energy transition around the world.
## 2023 by the numbers

<table>
<thead>
<tr>
<th>Category</th>
<th>Change</th>
<th>Details</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SUPPORTERS</strong></td>
<td>↑ 55%</td>
<td>▶ From 5,389 in 2022 to 8,374 in 2023</td>
</tr>
<tr>
<td><strong>WEBSITE VISITORS</strong></td>
<td>↑ 1.9 m</td>
<td>▶ Gem.wiki visitors</td>
</tr>
<tr>
<td><strong>ENGAGEMENT RATE</strong></td>
<td>↑ 90%</td>
<td>▶ From 2.3% in 2022 to 4.6% in 2023</td>
</tr>
<tr>
<td><strong>POSTS</strong></td>
<td>↑ 338</td>
<td>▶ Posts across LinkedIn &amp; Twitter / X</td>
</tr>
<tr>
<td><strong>MEDIA HITS</strong></td>
<td>10 100</td>
<td>▶ 46% year on year increase (Y0Y)</td>
</tr>
<tr>
<td><strong>EMAIL</strong></td>
<td>↑ 2×@</td>
<td>▶ 36 tracker emails in 2023 compared to 15 in 2022</td>
</tr>
<tr>
<td><strong>VISUALS</strong></td>
<td>150</td>
<td>▶ Graphics and data visualizations</td>
</tr>
<tr>
<td><strong>DOCUMENTS</strong></td>
<td>28</td>
<td>▶ Reports and briefings</td>
</tr>
</tbody>
</table>
Program Highlights

→ COAL
→ OIL & GAS
→ RENEWABLES & OTHER POWER
→ HEAVY INDUSTRY
→ SPECIAL PROJECTS
Prognosticators of the energy transition are wont to declare peak coal. But the dirtiest of fossil fuels has a particular staying power a bit like the experience of mountain climbing: Sometimes you think you’ve passed the crux of a climb and that the end is in sight, only to scale that apex and realize the summit still lies a ways ahead of you.

To be sure, significant progress has been made to rid the world of the last vestiges of coal since the landmark Paris climate accord was signed in 2015. More than half the countries with coal power have reduced or kept operating capacity flat since then. Yet most of that capacity in rich nations does not have a commitment to be retired before 2030 and for the rest of the world, before 2040, as mandated by the Paris Agreement.

Our coal program continues to set the global benchmark for tracking progress toward this essential milestone. In 2023, we released the ninth annual summary of the global coal fleet in partnership with civil society organizations around the world. In addition to driving a global narrative about progress towards a coal phaseout, as evidenced by over 1,000 media articles referencing the study, we reiterated calls for more leadership from the G7 to quicken the pace of retirements. As the first and richest dataset, GEM’s coal plants tracker provided fertile ground to deploy a new form of data-driven storytelling that was released in advance of COP28 and rounded out media reporting on the event.
Beyond the chimneys and open pits that provide the sector’s starkest visual references, the coal program also shined a light on the unseen but outsized impact of methane. The new Global Methane Emitters Tracker estimates emissions at nearly 9,000 methane-emitting assets and remotely-sensed methane plumes in order to track this short-lived greenhouse gas with serious capacity to accelerate global climate change. We highlighted this work through participation in high-level workgroups like the International Methane Emissions Observatory (IMEO) and the UN’s Economic Commission for Europe.

Support for mission-aligned organizations also continued throughout the year. In service of the NGOs Market Forces and Banktrack, we developed a boutique “financial forensics” project that identified 138 proposed projects connected to 30 corporate lenders to aid finance campaigning. We provided quarterly data to key funders and developed collaborations with academic institutions like the University of Maryland. We partnered with groups in Colombia to assess the country’s new mining projects in order to draw attention to the lack of transparency and public reporting of methane emissions.

Moving from coal plants to mines, innovation was on display with the launch of a machine learning tool to estimate coal mine workforces and review employment data in the Global Coal Mine Tracker. The data collection formed the basis of findings that 100 workers per day face potential unemployment by 2035 due to scheduled mine closures and market shifts toward cheaper wind and solar power generation. Global outlets like Bloomberg and Reuters carried the story to underpin the urgency of a just energy transition. In addition, we provided data on particular mines to groups like the International Energy Agency and the European Commission.
PROGRAM HIGHLIGHTS

Coal

LAUNCH: AUGUST 2013
COALWIRE
A weekly news bulletin summarizing the most significant developments affecting the global coal industry and highlighting the effort of groups around the world working on coal-related issues.

LAUNCH: OCTOBER 2014
GLOBAL COAL PLANT TRACKER
Catalogs every operating coal-fired generating unit, every new unit proposed since 2010, and every unit retired since 2000, with units often consisting of a boiler and turbine, and several units may make up one coal-fired power station.

LAUNCH: FEBRUARY 2021
GLOBAL COAL MINE TRACKER
Coal mines and proposed projects with asset-level details on ownership structure, development stage and status, coal type, capacity, production, workforce size, reserves and resources, methane emissions, geolocation, and over 30 other categories.

LAUNCH: DECEMBER 2021
GLOBAL COAL PROJECT FINANCE TRACKER
Financial transactions to coal-fired power stations and proposed coal projects with information on project financiers, transaction amounts, financial institutions, financing status, dates of financial close, and more.

LAUNCH: APRIL 2022
GLOBAL COAL TERMINALS TRACKER
Import, export, and domestic coal terminals with asset-level details on terminal ownership, geolocation, development stage and status, capacity, and more.
It was a year of push and pull for the oil and gas sector. While the outcomes of COP28 cemented the necessity to transition away from fossil fuels, a major expansion of gas infrastructure continued unfettered, particularly of liquefied natural gas (LNG) import and export capacity in Asia, Europe, and the U.S. A narrative advocating a role for gas as a transition fuel, along with the acceptance of false solutions like carbon capture and storage (CCS) and hydrogen aimed to further entrench fossil fuels in the debate about the energy transformation.

As a counterweight, GEM’s oil and gas program continued to provide timely information and analyses to track infrastructure developments in the sector so audiences are better able to assess and understand the challenges. Through assistance to mission-aligned organizations and global media outlets, the program aimed to reframe the debate through evidence-based insights.

We expanded coverage in our Global Gas Plant Tracker in July to include exclusively oil-fired power plants and oil and gas units using internal combustion technology. GEM’s annual report on the tracker’s data focused on Asia as a key regional driver in the sector. The report helped round out public discourse, with media outlets such as the Financial Times posing questions like, “Will Bangladesh come to regret its dash for gas?”
In partnership with regional civil society organizations, we produced a number of insights into the rapid expansion of the LNG sector and its effects on climate change. The analyses received widespread media coverage, including prominent features in Reuters, Politico, and the BBC.

Work with the Global Oil and Gas Plant Tracker and the Global Gas Infrastructure Tracker helped track some of the false solutions currently proposed by industry. For example, we track and map all hydrogen pipeline proposals in Europe and all turbines capable of burning hydrogen globally, as well as tracking CCS proposals for power plants and LNG terminals. The launch of the first comprehensive update to the Global Oil and Gas Extraction Tracker also received interest from across the spectrum.

With financial support from former U.S. Vice President Al Gore’s Climate TRACE, we were able to help the Rocky Mountain Institute fill gaps in its refineries data and improve emissions and capacity estimates by developing a dataset tracking “teapot refineries” in China. Teapot refineries are small, independent refineries that originally had a distinctive “teapot-shaped” appearance and today represent about one-fifth of China’s refinery capacity.

GEM’s regional trackers supported partner organizations in specific geographies. In Europe, we were asked to share insights from data in a webinar for campaigners about the impacts of the EU’s energy infrastructure response to Russia’s war in Ukraine. A joint briefing with groups in eastern Europe highlighted the risk of gas becoming further entrenched in a region otherwise independent from the fuel. Across Asia, we coordinated and co-authored a series on the region’s gas expansion. Additionally, we developed the first brief on gas extraction in Africa.

Finally, the biweekly news bulletin Inside Gas continued to provide insights into global gas industry developments and highlight the efforts of groups around the world working on gas-related issues. Its readership includes people from across the sector and grew by nearly a fifth in 2023, demonstrating the importance of this resource to the oil and gas space.
PROGRAM HIGHLIGHTS

Oil & Gas

LAUNCH: FEBRUARY 2020
EUROPE GAS TRACKER
Methane and hydrogen gas infrastructure across Europe, within and outside of the EU and other countries within the European gas network, as well as gas pipelines, LNG terminals, gas-fired power plants, and gas extraction sites.

LAUNCH: AUGUST 2021
INSIDE GAS
A weekly news bulletin that 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.

LAUNCH: JANUARY 2022
GLOBAL GAS INFRASTRUCTURE TRACKER
Resource on natural gas transmission pipeline projects and LNG import and export terminals, including all LNG terminals regardless of threshold, as well as all global gas transmission pipelines over predetermined size thresholds.

LAUNCH: JANUARY 2022
GLOBAL OIL & GAS PLANT TRACKER
Catalogs every oil and gas power plant at a specific capacity threshold of any status, including operating, announced, pre-construction, construction, shelved, canceled, mothballed, or retired.

LAUNCH: JANUARY 2022
GLOBAL OIL & GAS EXTRACTION TRACKER
Information on discovered, in-development, and operating oil and gas units worldwide, including both conventional and unconventional assets, tracking the status, ownership, production, and reserves of each unit.

LAUNCH: APRIL 2022
ASIA GAS TRACKER
Gas pipelines, LNG terminals, oil and gas-fired power plants, and gas extraction sites across Asia.

LAUNCH: JUNE 2022
GLOBAL OIL INFRASTRUCTURE TRACKER
Resource on crude oil and natural gas liquids transmission pipeline projects and their development, attempting to include all pipelines of any status.

LAUNCH: JULY 2022
AFRICA GAS TRACKER
Gas pipelines, LNG terminals, oil and gas-fired power plants, and gas extraction sites across Africa.
2023 was a year in the sun for renewable energy. The world now has a landmark agreement to triple renewable power by 2030, and GEM’s renewables and other power teams are uniquely positioned to support efforts to measure progress towards this essential target. By tracking capacity developments with solar, wind, geothermal, hydropower, bioenergy, and nuclear power, GEM is able to provide essential information about where and when capacity is being developed and coming online.

The Race to the Top report series continues to establish itself as a definitive source of information on renewables capacity developments across the world. In the first quarter of 2023, we reported on the solar and wind buildout across Latin America and found that Brazil, Chile, Colombia, and Mexico were among the leaders. The findings appeared in major national newspapers of record and helped solidify Race to the Top as a reference point on renewables developments.

The third installation in the series included an analysis of the jaw-dropping developments in China, revealing that the country was on track to double its utility-scale solar and wind power capacity and exceed its solar and wind targets five years ahead of schedule, if all prospective projects were completed. The report was truly a global story, with major outlets including The Guardian, BBC, Reuters, and Bloomberg showcasing the findings. It also demonstrated incredible staying power, as the headline
numbers were referred to throughout the year and even by COP28 president Sultan Al-Jaber in an editorial published by China’s state news agency.

With Sultan Al-Jaber and the Emirates preparing to host COP28, we compared how the heartland of oil and gas was progressing in its development of renewables. The brief illustrated the challenges the region faced in overcoming its historical dependence on hydrocarbons while also providing clean energy access locally. The findings provided a timely benchmark for audiences hoping to better understand how the host nation was progressing towards the tripling goal.

In an effort to round out coverage of the renewables sector, we launched three new power sector trackers that further positioned GEM as the go-to source of data for assessing progress towards 2030 targets: the Global Bioenergy Power Tracker, the Global Nuclear Power Tracker, and the Global Hydropower Tracker. Applications of GEM data are already visible: The New York Times ran an interactive feature on the exponential spread of pumped storage worldwide.

In addition, because solar power contributes the lion’s share to renewable power capacity additions in tripling renewables pathways, we doubled down by partnering with Transition Zero to expand coverage in the Global Solar Power Tracker to include capacities of less than 20 megawatts (MW), which make up more than half of the world’s global solar capacity.

Finally, with partners at the Climate TRACE coalition, the annual update of the Global Bioenergy Tracker expanded coverage to include units that co-fire with fossil fuel and/or are co-located with fossil-fired power units. It now tracks over 1,800 bioenergy units in 84 countries and features complete coverage of China up to a 30 MW capacity threshold.
Renewables & Other Power

GLOBAL SOLAR POWER TRACKER
A worldwide dataset of utility-scale solar photovoltaic and solar thermal facilities covering phases with capacities of 20 MW or more.

GLOBAL WIND POWER TRACKER
Includes utility-scale, on and offshore wind facilities of 10 MW or more, generally defined as a group of one or more wind turbines that are installed under one permit, one power purchase agreement, and typically come online at the same time.

GLOBAL GEOTHERMAL POWER TRACKER
Catalogs every geothermal power plant unit at a specific capacity threshold of any status, while tracking various types of technologies, including flash steam, dry steam, and binary cycle plants.

GLOBAL NUCLEAR POWER TRACKER
Catalogs every nuclear power plant unit of any capacity and of any status, with various technology types tracked in the dataset, including pressurized water reactors, boiling water reactors, fast breeder reactors, and others.

GLOBAL BIOENERGY POWER TRACKER
A worldwide dataset of utility-scale bioenergy power facilities with capacities of 30 MW or more, and units may combust multiple fuel sources in addition to bioenergy.

GLOBAL HYDROPOWER TRACKER
A worldwide dataset of hydropower facilities with capacities of 75 MW or more, including information about the capacity and number of turbine(s), as well technology types like conventional storage, run-of-river, and pumped storage facilities.
Climate TRACE are addressing heavy industry decarbonization through various lenses of policy action, emissions calculation methodologies, and reporting.

GEM’s heavy industry program plays an important role in this landscape by providing the highest quality, open access data on the iron and steel sector and, soon, the cement and concrete industry, as well as iron ore mining. The Global Steel Plant Tracker, a plant-level dataset of over 90% of the world’s iron and steel production capacity, enabled the development of the model used by the Climate TRACE initiative to track and report on...
greenhouse emissions from iron and steel production sites globally. The International Energy Agency has called it “the most comprehensive effort to aggregate and disclose key production method and capacity data for public use.”

Campaigners and policymakers have used the Global Blast Furnace Tracker to identify the most important and at-risk assets in the green steel transition and to support various tools and reports, such as the Global Steel Transformation Tracker from Agora Industry, the Industrial Facilities Tracking Tool from Industrious Labs, and an in-depth analysis of the role of banks in coal-based steelmaking from Reclaim Finance.

We also play a key role in various network partnerships and collaborations by facilitating bi-monthly meetings of the global Steel Data Network, which convenes steel campaigns and network groups. One such project is the Green Steel Tracker, developed together with the Steel Data Network in 2021. The tracker is now hosted and maintained by LeadIT, and we continue to collaborate with this team to share data insights, produce reports, and ensure that all GEM datasets are fully integrated and easily merged by data users.

The analyses we produce based on the data in GEM trackers help inform the global debate over decarbonizing heavy industry. The flagship publication Pedal to the Metal is regularly covered by top-tier media, like the Financial Times, which used it to ask “Can the Steel Industry Go Green?” Together with LeadIT, a deep dive into the industry’s commitment to net zero targets prior to COP28 featured in outlets like the Wall Street Journal.

While the team hosts a wealth of data on heavy industry sectors, GEM’s contributions to heavy industry decarbonization don’t stop there as we push the needle to provide more transparent and open access data from these sectors and engage in countless collaborations and initiatives to put the pedal to the metal towards net zero for heavy industry.
PROGRAM HIGHLIGHTS

Heavy Industry

LAUNCH: FEBRUARY 2021
GLOBAL STEEL PLANT TRACKER
Information on global crude iron and steel production plants, with details about coal-based methods (blast furnace and basic oxygen furnace or open hearth furnace) or electricity-based production (electric arc furnace charged with scrap metal, pig iron, direct reduced iron, or a combination).

LAUNCH: JUNE 2023
GLOBAL BLAST FURNACE TRACKER
A worldwide dataset of blast furnace units including plants with a crude iron or steel capacity of 500 thousand tonnes per annum or more, as well as those that have been proposed or under construction since 2017 and retired or mothballed since 2020.
A one-size-fits-all approach won’t solve the challenge of a global energy transition, and neither are GEM interventions clearly defined by one sector or tracker. In 2023, we supported a number of special projects that spanned industries and cross sections of stakeholders working for a sustainable energy future.

We tracked non-traditional forms of finance like private equity. Together with a consortium of mission-aligned organizations called Private Equity Climate Risks, we co-authored an investigation into the climate credentials of the Carlyle Group, one of the world’s largest yet least understood financial entities. The report provided a first-of-its-kind analysis examining Carlyle’s energy portfolio over a decade, making visible data previously unavailable data to investors and the public. The consortium subsequently authored investigations on the emissions and environmental justice impacts of energy holdings-backed equity giants by Brookfield Asset Management and Kohlberg Kravis Roberts & Co. (KKR), as well as launching a database of private equity-backed energy companies.

We informed a global network of stakeholders about the energy transition by zeroing in on key areas around the world. Launched in May, the Global Energy Transition Tracker includes a detailed look at iconic zones — including Gujarat, Odisha, North Sea, Bali, Vietnam, Tunisia, and to La Guajira — that offer insights into the levels of social, environmental, and economic challenges of this transition.

Together with Climate TRACE, we documented ownership data across a number of GEM trackers to inform a TRACE release ahead of COP 28. The ownership team tracks all entities that connect immediate owners with their parent companies, including information on where these entities are registered and headquartered and the type of entity, such as whether it is a corporation or government-backed group.

In GEM’s most ambitious dataset to date, we launched the Global Integrated Power Tracker in the first quarter of 2024, rolling up the eight power sector trackers into a list of approximately 100,000 plants. The goal of the integrated power tracker is to provide cross-sector analyses, data visualizations, and enhanced insights, and we look forward to its rapid uptake by practitioners in the space who are looking to have a macro view of the world’s power sector.
PROGRAM HIGHLIGHTS

Special Projects

LAUNCH: SEPTEMBER 2022
PORTAL ENERGÉTICO PARA AMÉRICA LATINA
A region-wide perspective on energy infrastructure in Latin America and the Caribbean with research on nearly 5,000 projects including coal- and gas-fired power plants, oil and gas pipelines, oil and gas extraction sites, LNG terminals, solar farms, wind farms, coal terminals, coal mines, and steel plants.

LAUNCH: NOVEMBER 2023
GLOBAL METHANE EMITTERS TRACKER
Provides estimates of fossil fuel emissions at oil and gas and coal extraction sites, natural gas transmission pipelines, proposed projects and reserves, and attribution of remotely-sensed methane plumes.

LAUNCH: FEBRUARY 2024
PRIVATE EQUITY ENERGY TRACKER
Part of a multi-organization initiative known as the Private Equity Climate Risks (PECR) project, which investigates the role of the private equity industry in the climate crisis and aims to demand better accountability by highlighting discrepancies between private equity firms’ publicly stated environmental, social, and governance commitments and their actual investment practices.

LAUNCH: MARCH 2024
GLOBAL INTEGRATED POWER TRACKER
A multi-sector dataset of power stations and facilities worldwide providing unit-level information on thermal power (coal, oil, gas, nuclear, geothermal, bioenergy) and renewables (solar, wind, hydro).

LAUNCH: MARCH 2024
GLOBAL ENERGY OWNERSHIP TRACKER
Information on the chain of ownership for various energy projects, including the chain from the direct owner up to their highest-level ultimate parents like corporations, investment firms, and governments.

LAUNCH: MAY 2024
GLOBAL ENERGY TRANSITION TRACKER
Highlights iconic zones that hold significant importance within the context of the energy transition pathway, with each zone providing information on symbolic value, government policies and targets, finance, employment, transmission, la...
Who uses GEM’s data?
Financial Information
## Balance Sheet (US$)

### ASSETS
- Cash and cash equivalents: $2,126,114
- Contributions receivable: $3,461,828
- Refundable deposits and advances: $187,604
- Prepaid expenses: $82,313

**TOTAL ASSETS:** $5,857,859

### LIABILITIES
- Accounts payable and accrued expenses: $325,682
- Accrued paid time off: $447,223

**TOTAL LIABILITIES:** $772,905

### NET ASSETS
- Without donor restrictions: $580,063
- With donor restrictions: $4,504,891

**TOTAL NET ASSETS:** $5,084,954

**TOTAL LIABILITIES AND NET ASSETS:** $5,857,859
FINANCIAL INFORMATION

Share of Expenditure by Category (%)

Source: Global Energy Monitor Annual Report
*Other includes Office expenses/supplies (0.5%), Travel (0.4%), Advertising and promotion (0.1%), Insurance (0.1%) and Other (0.1%)
GEM is grateful for the financial support provided by the following organizations from 2021 to 2023:

→ African Climate Foundation
→ Blanchette Hooker Rockefeller Fund
→ Children’s Investment Fund Foundation (CIFF)
→ Climate Imperative Foundation
→ Climate TRACE
→ ClimateWorks Foundation
→ Energy Transition Fund
→ European Climate Foundation
→ Ford Foundation
→ IEEFA

→ KR Foundation
→ Meliore Foundation
→ Pooled Fund on International Energy
→ Quadrature Climate Foundation
→ Stockholm Environment Institute
→ Tara Climate Foundation
→ Tiina and Antti Herlin Foundation
→ U.S. Energy Foundation
→ Windward Fund/Global Methane Hub