

ANNUAL

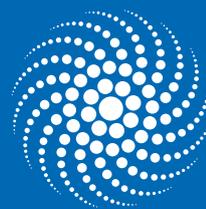
REPORT

2019

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iema
Instituto de Energia
e Meio Ambiente

INTRODUCTION

IEMA follows a **Strategic Plan** to carry out its activities, guided by **Five Strategic Goals**, through projects distributed across **Nine Lines of Action**.

This report initially presents a summary of the Strategic Goals and subsequently describes the activities developed and the main achievements of 2019.

It also presents supporters, Balance Sheet and fund allocation.

Enjoy your reading!



SUMMARY



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The Institute for Energy and Environment (IEMA), founded in 2006, is a non-profit Brazilian organization. With headquarters in São Paulo, it is known for its role as disseminator of technical and scientific knowledge on environmental impacts.

PURPOSE

To qualify decision-making processes for transportation and energy systems to ensure sustainable use of natural resources with social and economic development.

VALUES

Generosity: cooperation and knowledge sharing with society.

Excellence: appreciation of scientific rigor and independent thinking.

Transparency: genuine openness and listening.

Impact: focus on long-lasting transformation in the public's interest.

WHO WE ARE

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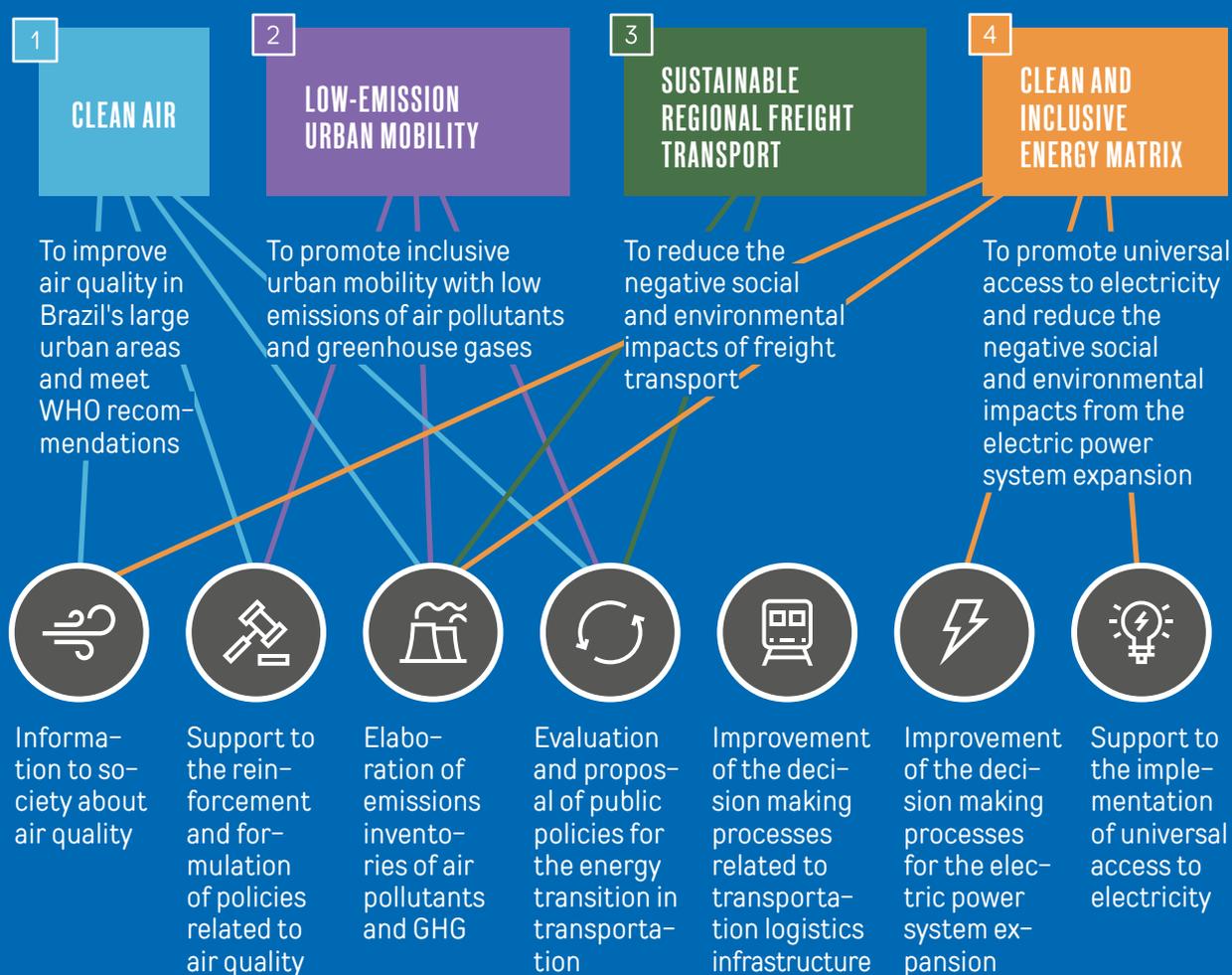
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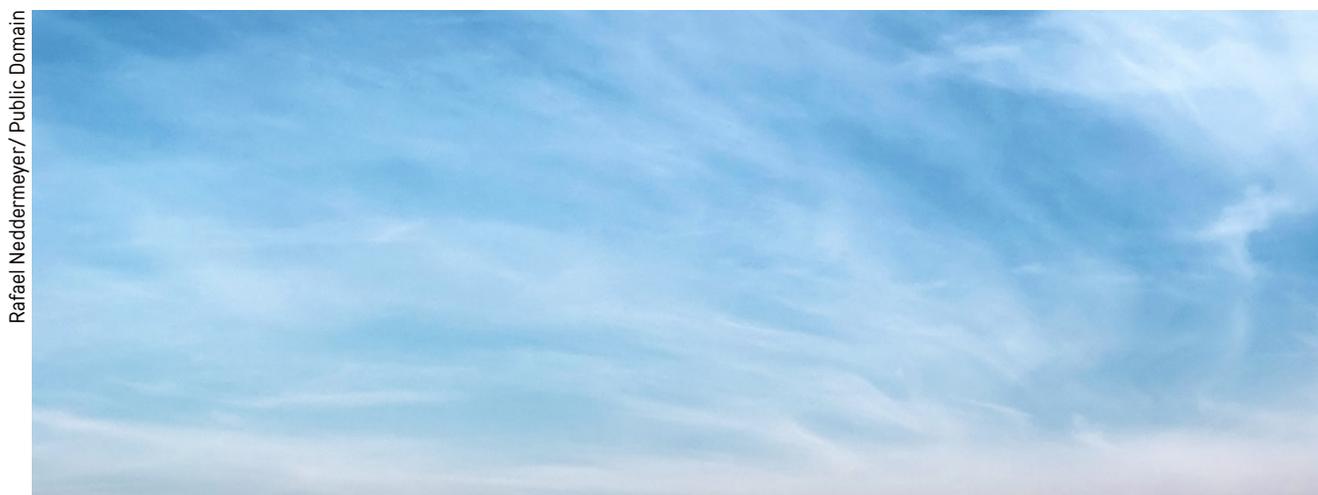
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STRATEGIC GOALS



LINES OF ACTION



CLEAN AIR

TO IMPROVE AIR QUALITY IN BRAZIL'S LARGE URBAN AREAS AND MEET THE RECOMMENDATIONS OF THE WORLD HEALTH ORGANIZATION (WHO).

Air pollution represents a threat to human health and is linked to respiratory and cardiovascular diseases. As part of the United Nations (UN) System, the WHO has established general guidelines for nationwide public policies on air quality. Based on the best of scientific knowledge, the organization recently recommended maximum acceptable concentrations of certain air pollutants, in an effort to protect human health.

In Brazil, both the WHO recommendations and the national air quality standards are systematically violated. It is not by accident that deaths associated with air pollution increased by 14% between 2006 and 2016, accounting for a considerable portion of deaths from Noncommunicable diseases (NCDs)*.

Joining the fight against this public health issue in major Brazilian urban hubs, IEMA produces and systematizes technical knowledge, raising awareness about the topic and contributing to the improvement of Brazil's air quality management.

* Available at: <https://www.gov.br/saude/pt-br/assuntos/noticias/mortes-devido-a-poluicao-aumentam-14-em-dez-anos-no-brasil>. Accessed on: October 28, 2020.

INFORMATION ABOUT AIR QUALITY AVAILABLE TO SOCIETY

Monitoring air pollutant levels is an important management tool. It helps identify possible risks to human health and subsidize the development and evaluation of public policy on the subject. It is paramount for Brazil to build an air quality monitoring network, and the information collected by the network should be widely shared to raise society's awareness of the risks it is facing, allowing members of the public to defend their interests in the process of developing and implementing public policies.

NATIONAL AIR QUALITY POLICY

Because air pollution has multiple causes, tackling it requires a multi-sector approach that can: (i) strengthen the technical and budgetary capacity of environmental agencies to incorporate their own environmental management tools – air quality monitoring, inventory of emissions, source control, etc., and (ii) promote close liaison for the implementation of public policies in health, transportation, energy, industry, etc. and between federal government agencies and state and local agencies.





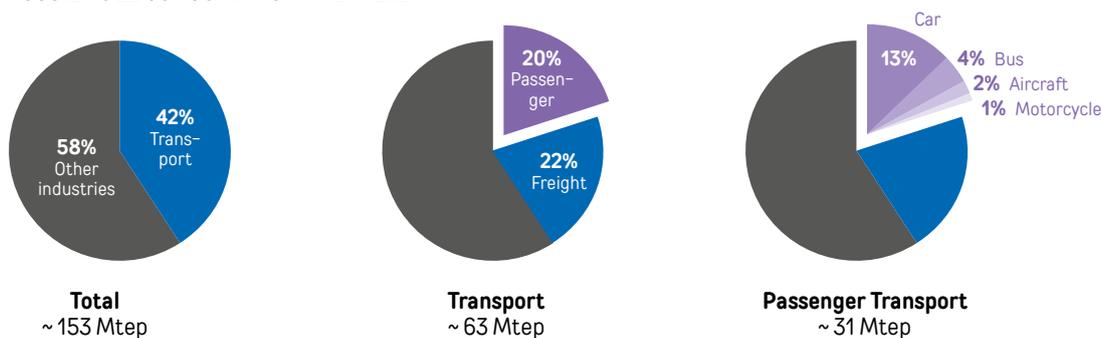
Sergio Souza/ Unsplash

INCLUSIVE URBAN MOBILITY WITH LOW EMISSIONS

TO PROMOTE INCLUSIVE URBAN MOBILITY
WITH LOW EMISSIONS OF AIR POLLUTANTS
AND GREENHOUSE GASES

Passenger transportation in Brazil is highly dependent on fossil fuel supply. 2019, this segment accounted for 20% of the fossil energy consumed in the country, primarily in urban environments.

FOSSIL FUEL CONSUMPTION IN BRAZIL



Source: IEMA

The prevalence of fossil fuels in the energy matrix for transportation, combined with an urban mobility pattern that is rooted in the growing use of individual motorized transport, explains the significant increase in greenhouse gas emissions from passenger transportation over the decades, reaching 95 MtCO₂e in 2019 and corresponding to 23% of Brazilian emissions associated with energy use and production.

In addition to being energy-inefficient and greenhouse gas-intensive, an urban mobility pattern based on individual motorized transportation heightens many of the current issues characterizing the country's mid-sized and large cities:

- **Urban sprawl** and the consequent increase in travel distances, time and costs.
- Higher number of traffic accidents and **victims**.
- Increase in **traffic jams**, imposing major economic costs into society.
- Degradation of **common areas**.
- Difficult access to the opportunities of large cities.
- Growing demand for more **road space**.
- Deterioration of **air quality**.

Keen to help reverse this scenario, IEMA has systematized and produced technical knowledge to support measures to reduce energy consumption, while adopting non-polluting energy sources that can also promote equitable and safe access to opportunities offered by cities.





Tarcisio Schneider/ Shutterstock

SUSTAINABLE REGIONAL FREIGHT TRANSPORT

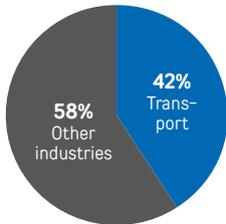
TO REDUCE THE NEGATIVE SOCIAL AND
ENVIRONMENTAL IMPACTS OF FREIGHT TRANSPORT

One of the key themes for decarbonizing the Brazilian economy is the activity of freight transport, which in 2019 accounted for 25% of greenhouse gas emissions associated with the energy matrix.

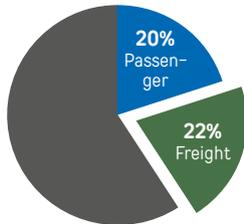
The prominence of road transportation and heavy dependence on diesel fuel for trucks justify the importance of this issue when it comes to implementing measures to mitigate emissions.

Apart from greenhouse gas emissions, there are other relevant socio-environmental issues related to freight transport in Brazil. These issues have not been properly considered in the early stages of the decision-making process for infrastructure implementation (roads, railways, waterways, ports), threatening the well-being of communities and the environmental preservation of vulnerable territories.

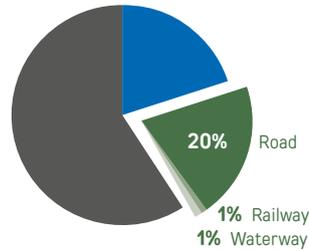
FOSSIL FUEL CONSUMPTION IN BRAZIL



Total
~ 153 Mtep



Transport
~ 63 Mtep



Freight Transport
~ 32 Mtep

Source: IEMA

To find solutions for some of the socio-environmental challenges facing freight transport in Brazil, IEMA has been producing and systematizing technical knowledge and contributing to qualified debate towards: (i) expanding the diversity of transportation modes, by shifting to high-capacity, high-efficiency modes (railways and waterways); (ii) replacing oil distillate fuels with other energy sources that are less greenhouse gas-intensive; and (iii) incorporating social and environmental risks into policies, planning and regulation for freight transport and associated infrastructures.

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Jaboticaba Images/ Shutterstock





CLEAN AND INCLUSIVE ENERGY MATRIX

TO PROMOTE UNIVERSAL ACCESS TO ELECTRICITY

Although it does not specifically mention access to electricity as a fundamental right, the Brazilian Constitution determines that the rights listed therein do not exclude others arising from its principles. One of these principles is “dignity of the human person,” which is sufficient to characterize access to electricity as a fundamental right. Still, a Proposed Amendment to the Brazilian Constitution no. 44/2017 is being debated. It seeks to expressly include access to electricity as a fundamental social right.

Electric utilities in Brazil do not serve the country’s entire population. According to IEMA’s estimates, nearly one million people still

have no access to electricity in the Amazon region. Funds provided by government programs for universal *access to electricity* have been relatively scarce, and are mostly allocated to residential consumption, without considering possible demands for local production activities. Electricity access expansion is key to promote local socio-economic development, strengthen communities and increase the resilience of a strategic region for the country.

Electricity access expansion has not progressed slowly, but has also been primarily based on fossil fuel consumption. In many cases, communities have organized around precarious and polluting systems, such as generators powered by diesel and gasoline. Strictly speaking, it is not possible to claim Brazil's public policy is sufficiently comprehensive to guarantee access to electricity from renewable resources. The installation of off-grid renewable systems in remote areas of the Amazon on an appropriate scale remains a challenge.

In order to promote universal access to electricity, IEMA develops a number of activities to subsidize the creation and implementation of public policies that incorporate consistent planning, financing and monitoring instruments.



Aluizio Cardoso/ Shutterstock



Promotion/ Eduardo Tavares

CLEAN AND INCLUSIVE ENERGY MATRIX

TO REDUCE THE NEGATIVE SOCIO-ENVIRONMENTAL
IMPACTS FROM ENERGY SYSTEM EXPANSION

Power generation in Brazil historically originates from hydroelectric power plants. However, since most of the country's remaining hydropower potential is located in the Amazon, a sensitive region from both social and environmental perspectives, the Brazilian electricity matrix is already experiencing a transition period marked by the presence of hydroelectric power.

Governments and corporations seem to prefer thermal power plants as a technological option. Recent auctions contract-

ed large amounts of energy from natural gas plants. There are also a number of initiatives towards a “new gas market,” which ends up pressuring for higher thermal power generation at the same pace as the exploration of pre-salt reserves, and even imports of liquefied natural gas (LNG).

In addition higher greenhouse gas emissions, the expansion of thermal power generation heightens the risks to public health due to air pollution. Furthermore, depending on the water basin where new plants are installed, conflicts for the use of water could worsen. These risks, coupled with the chronic operational, budgetary and institutional strains faced by environmental entities, could hinder the timeliness of socio-environmental evaluations and their transparency and depth.

This scenario requires integrated solutions among financial and environmental entities and the power industry, with the purpose of considering socio-environmental risks in the early stages of planning for the expansion of the electricity system. The goal is to avoid proposing of projects in territories where these risks are too high. Although the financial industry does not play the role of regulator, its power to induce greater transparency in environmental financing and protection through socio-environmental policies, could be more effective in promoting changes in the production sector’s behavior than regulation itself.

Overall, IEMA’s role is to produce and systematize technical knowledge to promote qualified debate in society on two complementary fronts: (i) incorporation of socio-environmental risks in the planning and regulation of the electricity system expansion; and (ii) improved socio-environmental governance in financial institutions, so they can use appropriate protection measures when funding the expansion of the energy industry.



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KEY ACHIEVEMENTS IN 2019

COMMUNICATION

SUPPORTERS AND
FINANCIAL INDICATORS

KEY ACHIEVEMENTS IN 2019

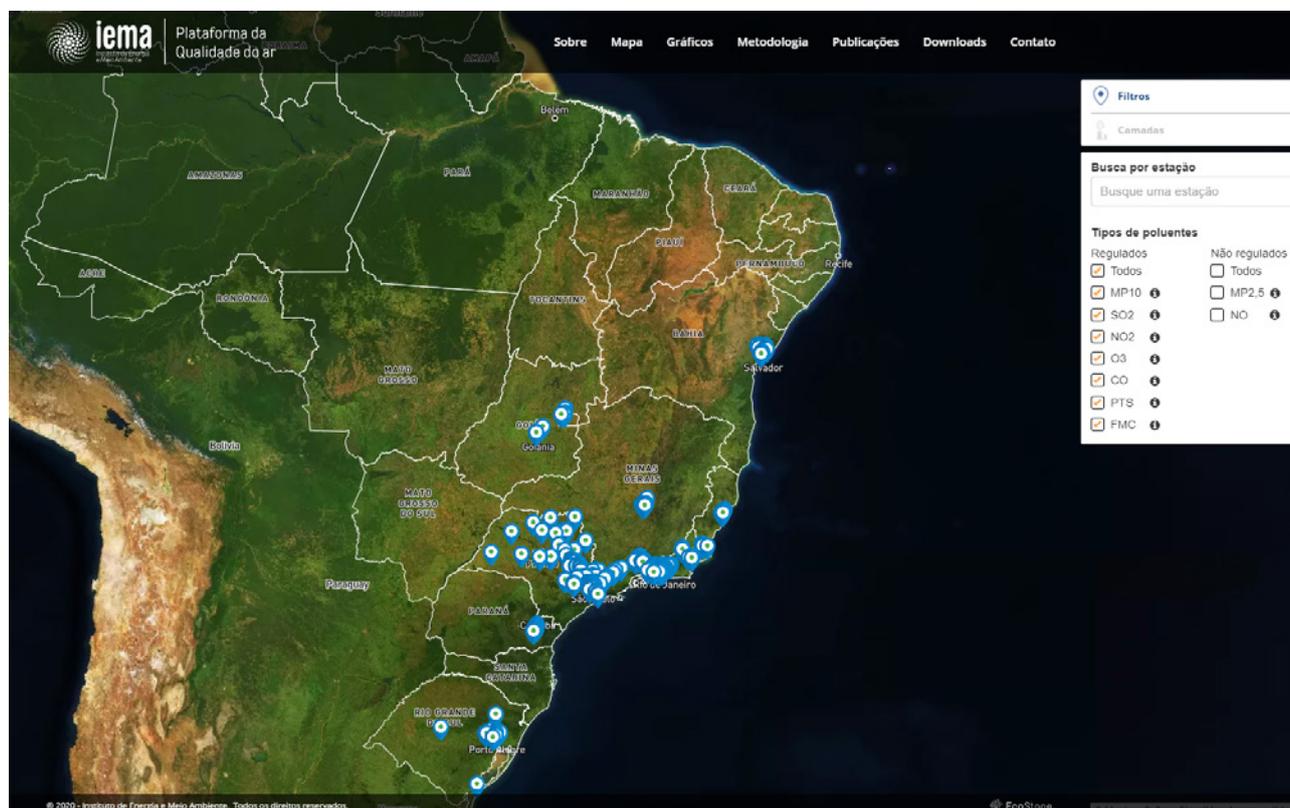


CLEAN AIR

AIR QUALITY PLATFORM

Over the course of its history, IEMA accumulated comprehensive experience and knowledge on access to, collection and disclosure of air quality monitoring data produced by state-level environmental entities (Órgão Estadual de Meio Ambiente, OEMAs). In 2015, the Air Quality Platform was developed to integrate and disclose the country's air quality data. The platform enables searches for data in pre-designed graph and table formats. The entire database is available for download at <http://qualidadedoar.org.br/>.

The Platform has been used by the WHO as a source of information on Brazil's air quality (<https://whoairquality.shinyapps.io/AmbientAirQualityDatabase/>). IEMA has also been frequently asked by OEMAs, civil society organizations, and communication vehicles to expand the disclosure of this information.



With the support of state-level environmental entities, the Platform is updated annually with the most recent data generated by monitoring networks operating in Brazil. In 2019, in addition to updating the Platform, IEMA supported the State Foundation for the Environment an environmental entity in the state of Minas Gerais, in treating and validating air quality data collected by the state's monitoring network. This allowed the State Foundation for the Environment to disclose its most recent data on its *website* (information about the year 2015 through 2017).

Vinícius Loures/ House of Representatives



Beatriz Oyama represents IEMA at the House of Representatives in Brasília.

NATIONAL AIR QUALITY POLICY

In 2018, a Bill was introduced in the House of Representatives to enact the National Air Quality Policy and create the National Air Quality Information System (PL 10,521/2018). In 2019, IEMA and other non-governmental organizations studied the project and offered a number of proposals to improve the Bill in terms of: (i) attribution of liability to specific government entities; (ii) resources to implement the

policy's actions; (iii) procedures to establish parameters for air quality standards; and (iv) maximum emission limits.

IEMA also took part in a public hearing called by the Urban Development Commission of Brazil's Federal House of Representatives to discuss the Bill, explaining the importance of emission inventories, air quality monitoring, and air quality standards (<https://edemocracia.camara.leg.br/audiencias/sala/1151>).

ARTICLES

FOLHA DE S.PAULO

What we need to help us breathe better in big cities

The establishment of new air quality standards in Brazil, aligned with the WHO recommendations regarding the recently-approved CONAMA resolution, was a big step. However, this is only the starting point for air quality to be effectively reestablished

<https://www1.folha.uol.com.br/opiniaao/2019/01/o-que-falta-para-respirarmos-melhor-nas-grandes-cidades.shtml>

PÁGINA 22

Steps to tackle air pollution in Brazil

The theme of the 2019 World Environment Day was air pollution. The article explains how we can mitigate this problem in Brazilian cities

<http://pagina22.com.br/2019/06/04/passo-a-passo-para-enfrentar-a-poluicao-do-ar-no-brasil/>

CATRACA LIVRE

World Environment Day: what we can do to improve air quality

The article shows how adequate public policies and air quality monitoring can help the fight against air pollution

<https://catracalivre.com.br/cidadania/dia-mundial-do-meio-ambiente-qualidade-do-ar/>

IEMA IN THE MEDIA

Accessed on: October 28, 2020.

TV CÂMARA

Expert explains air quality monitoring in Brazil

<https://www.youtube.com/watch?v=mC1wuzwJrfo>

THE INTERCEPT

The air in São Paulo is much worse than the government says

<https://theintercept.com/2019/03/07/ar-sao-paulo/>

GAZETA DO POVO

92% of the world's population is not breathing clean air; understand how this scenario can change

<https://www.gazetadopovo.com.br/haus/sustentabilidade/qualidade-ar-quase-toda-populacao-mundial-nao-respira-ar-limpo/>

FOLHA DE S.PAULO

Tires are accomplices to 5,000 deaths in São Paulo

<https://www1.folha.uol.com.br/colunas/marceloleite/2019/06/pneus-sao-cumplices-em-5000-mortes-em-sao-paulo.shtml>

TV GLOBO

World Environment Day: air pollution is the cause of more than 4 million deaths every year

<https://globoplay.globo.com/v/7668195/>

TV GLOBO

The day to fight pollution

<https://globoplay.globo.com/v/7842205/>

RÁDIO SENADO

Conversation: World Environment Day

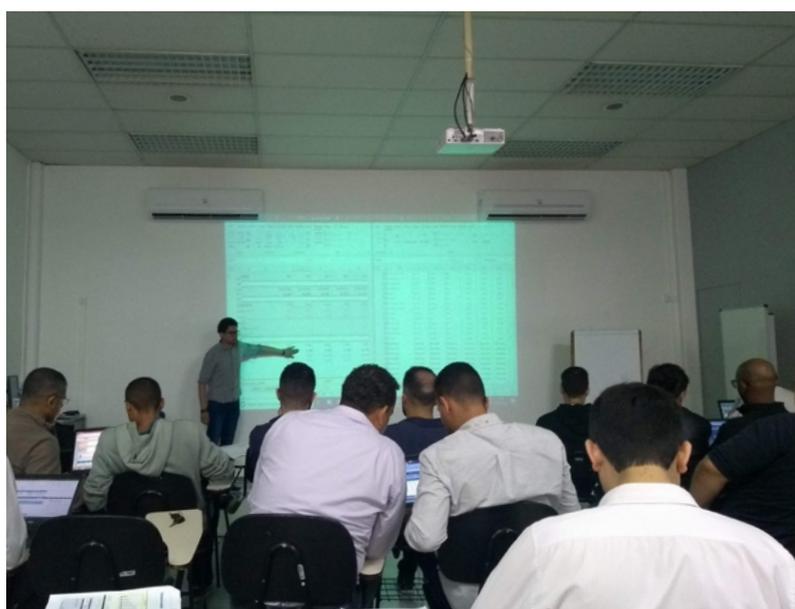
https://www12.senado.leg.br/radio/1/conexao-senado/dedo-de-prosa-dia-mundial-do-meio-ambiente?utm_source=ms-radio&utm_medium=ms-radio&utm_campaign=ms-radio

INCLUSIVE URBAN MOBILITY WITH LOW EMISSIONS

ENERGY TRANSITION IN PUBLIC BUS TRANSPORTATION

In 2018, with the Municipal Law nº 16,802, the city of São Paulo established the gradual elimination of pollutant and greenhouse gas emissions in public transportation. São Paulo Transportes (SPTrans), the company responsible for managing one of the world's largest bus transportation systems, included targets in its concession agreements for transportation service operators to meet by 2038 (100% reduction in CO₂, MP and NOx emissions).

Since IEMA has a history of evaluating public policies on energy use and air emissions in the transportation industry, SPTrans requested the institute's support to develop a tool for the Municipal Government to oversee the application of Municipal Law no. 16,802, and that could also be used by operators to plan the replacement of buses powered by diesel. IEMA developed PLANFROTA, a simulation tool that creates emission forecasts for public transport concession lots until 2018 (<http://energiaeambiente.org.br/produto/planfrota-ferramenta-para-transporte-limpo>) and explores different fleet composition scenarios, in terms of technological configuration and energy sources (biodiesel, electricity, etc.).



Isis Nóbile Diniz/ IEMA



CLEAN ENERGY FOR PUBLIC TRANSPORTATION

IEMA participated as a debater in the public hearing called by the Commission for Participative Legislation of the Federal House of Representatives to discuss the issue of “Clean Energy for Public Transportation.” Together with Instituto de Estudos Socioeconômicos (INESC) and Instituto de Defesa do Consumidor (IDEC), IEMA discussed the topic of fair energy transition in public transportation, advocating for initiatives to avoid possible tariff effects resulting from the replacement of diesel in urban buses. The institute also highlighted the importance of considering alternative funding sources for public transportation and finding new contractual and operational models without imposing additional costs to users.

Also in 2019, IEMA prepared and offered training for PLAN-FROTA to the technical team of SPTrans and bus operators. At the time, in addition to a general version for all, each operator received a customized version with information about their own concession lot. As a result, in January 2020, they would be able to deliver their fleet renovation plans in accordance with the requirements for emission reduction established by law.

TECHNICAL PARTNERSHIPS

- Technical support to Brazil’s **National Department for Urban Mobility and Services** (Ministry of Regional Development) in updating the environmental indicators of the Urban Mobility Information System (**SIMU**) (<https://www.gov.br/mdr/pt-br/assuntos/mobilidade-e-servicos-urbanos/sistema-de-informacoes-em-mobilidade-urbana-2013-simu>) and preparing the report entitled “**Pesquisa Nacional de Mobilidade Urbana 2018**” (<https://antigo.mdr.gov.br/mobilidade-e-servicos-urbanos/sistema-de-informacoes-em-mobilidade-urbana-simu/232-secretaria-nacional-de-transporte-e-da-mobilidade/informacoes-e-indicadores-semob/6021-pesquisa-nacional-de-mobilidade-urbana-2018>).
- Technical support to **MOBILIDADOS**, a web platform coordinated by the Institute for Transportation & Development Policy (**ITDP**) to provide urban mobility indicators for the 27 Brazilian capitals and nine metropolitan areas. IEMA provides indicators for carbon dioxide (CO₂) and particulate emissions associated with the use of diesel, gasoline and ethanol in transportation systems.
- Support to **Rede Nossa São Paulo** in preparing a map of inequality, or **Mapa da Desigualdade** (<https://www.nossasaopaulo.org.br/arqs/mapa-da-desigualdade-apresentacao-2016.pdf>). IEMA provided information about particulate emissions generated by combustion and tire wear, breaks and roads from passenger transportation in different areas of the city of São Paulo. The numbers revealed that despite accounting for a little under 30% of daily trips (according to the 2017 “Origem-Destino” survey conducted by the São Paulo subway operator, Metrô de São Paulo), automobiles represent over 70% of particulate emissions on a regular day.

- At the request of the **Laboratório de Mobilidade Sustentável (LABMOB)** of the **Faculdade de Arquitetura e Urbanismo da Universidade Federal do Rio de Janeiro (UFRJ)**, IEMA developed a methodology to quantify emissions of carbon dioxide equivalent (CO₂e) and particulate matter avoided by the use of **bike and scooter sharing systems**. The methodology and the results of its application in the city of São Paulo will be published in a book chapter about public bicycles, organized by LABMOB/FAU-UFRJ.

INTERNATIONAL PRESENCE

- In 2019, IEMA was in Madrid for the **Conference of the Parties (COP 25)** of the United Nations Framework Convention on Climate Change. The team attended official side events and exhibits by countries and institutions. The purpose of the trip was to engage in discussions and share information with organizations dedicated to overcoming the challenges of greenhouse gas emission reduction in transportation, and their connection to air pollution. A report about everything IEMA saw at COP 25 was shared with the public at: <http://energiaeambiente.org.br/boletim/cop25-o-que-vimos-sobre-transporte-e-poluicao-do-ar>.
- Marcelo Cremer, a researcher at IEMA, went to Washington, D.C. to attend the **Annual Meeting of the Transportation Research Board (TRB)**. The event was held at the US National Academy of Sciences, Engineering and Medicine and covered three main changes currently in progress in mobility: electrification, automation and sharing.

IEMA IN THE MEDIA

CHAMBER OF DEPUTIES

Experts suggest measures to guarantee transportation as a social right

<https://www.camara.leg.br/noticias/604590-especialistas-sugerem-medidas-para-a-garantia-do-transporte-como-direito-social/>

JORNAL DA CULTURA

With a total of 15 vehicles, São Paulo's electric bus fleet is the largest in the country

<https://youtu.be/pD-E4WzFUo?t=69>

TV GLOBO

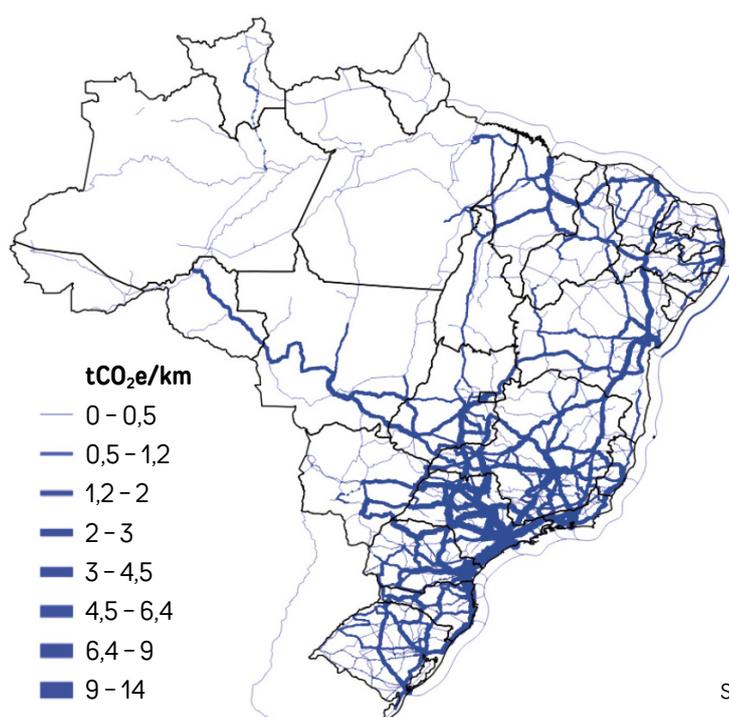
Dia de combate à poluição: entidades ambientais e prefeitura discutem lei para reduzir poluentes

<https://globoplay.globo.com/v/7842205/programa/>

SUSTAINABLE REGIONAL FREIGHT TRANSPORT

SCENARIOS FOR TRANSPORT LOGISTICS INFRASTRUCTURE AND EMISSIONS

Based on prior experience with emissions inventories and studies on transport modeling, IEMA developed a methodology to estimate emissions of greenhouse gases and air pollutants in different future scenarios of transport logistics infrastructure. Due to the application of a comprehensive georeferenced approach, the results can be analyzed by transportation mode, types of goods transported, and freight routes.



Source: IEMA

TECHNICAL PARTNERSHIPS

EMPRESA DE PLANEJAMENTO E LOGÍSTICA

Based on the methodology developed under a Cooperation Agreement, IEMA provided technical support to **Empresa de Planejamento e Logística (EPL)** for the **incorporation of the environmental dimension into the planning of a transport logistics infrastructure.**

FUNDAÇÃO DOM CABRAL

With the purpose of developing actions and technical studies to promote better understanding and disclosure of the logistics infrastructure planning process in the country, particularly in regards to social and environmental issues, IEMA and Fundação Dom Cabral signed a Technical Cooperation Agreement in 2019. The activities covered in the agreement include the study of alternative scenarios for the sustainable development of Brazil's logistics infrastructure.



WORKSHOP: “DECARBONIZING FREIGHT TRANSPORTATION IN BRAZIL”

To discuss the challenges and paths towards increasing the presence of railway and waterway freight transportation, IEMA facilitated a **workshop entitled “Decarbonizing Freight Transportation in Brazil”**. The event was designed to qualify the debate among civil society organizations, and included presentations by IEMA, Brazil’s National Association of Freight Transportation Users (Associação Nacional dos Usuários de Transporte de Carga, ANUT), Fundação Dom Cabral (FDC), and former managers of Empresa de Planejamento e Logística (EPL) and Brazil’s National Land Transportation Agency (Agência Nacional de Transportes Terrestre – ANTT).

TRANSPORT LOGISTICS INFRASTRUCTURE IN THE AMAZON

With the support of the **Moore Foundation and CLUA**, the project entitled **“Sustainable Transport Infrastructure in the Amazon”** was initiated in 2019. In order to strengthen the capacity of civil society organizations and contribute to a qualified debate on Freight Transportation Policy, Planning and Regulation, the project (expected to be concluded in the second half of 2020) comprises four key activities: (i) analysis of the Origin–Destination matrix for freight in the Amazon; (ii) gathering of information of transport infrastructure projects in the Amazon; (iii) socio–environmental analysis of transport infrastructure scenarios, and (iv) legal and institutional mapping of the decision–making process for logistics infrastructure in Brazil.

UNIVERSAL ACCESS TO ELECTRICITY: THE AMAZON

INTERNATIONAL SYMPOSIUM “ENERGY SOLUTIONS FOR COMMUNITIES IN THE AMAZON”

In 2019, IEMA joined Rede Energia e Comunidades (Rede E&C), a group that advocates for the full right to clean sustainable energy, as determined by Brazilian law and UN Sustainable Goal #7 (<https://www.energiaecomunidades.com.br>).

Rede E&C organized the **International Symposium entitled “Energy Solutions for Communities in the Amazon”**, attended by 830 participants, including indigenous and community leaders from various states and countries across the Amazon forest, representatives of federal and state governments, financial sector representatives, members of research centers, civil society organizations, cooperation agencies, public managers, businesspeople, and students. The Symposium resulted in concrete recommendations for overcoming energy exclusion in remote Amazonian communities.

MAIN RECOMMENDATIONS FROM REDE E&C FOR ELECTRIFICATION OF REMOTE AREAS IN THE AMAZON.

- A comprehensive mapping of communities and populations that currently have no access to electricity in remote areas of the Amazon.
- Brazil needs an electrification plan for remote Amazonian regions, with targets added to the Ten-Year Energy Plan of Brazil's Ministry of Mines and Energy.
- Multi-annual targets for rural electrification established by energy distribution companies can be submitted for public consultation in the states and cities before their approval by regulatory agency ANEEL.
- The goals and targets of energy distribution companies must include meeting the production demand of communities.
- Convergence between the rural electrification programs and other government initiatives and policies is key, as well as the expansion of appropriate funding programs according to the reality of these communities, aiming to foster production chains and local development plans.
- Service expansion in remote areas must include training and qualification for the management of electricity generation systems.

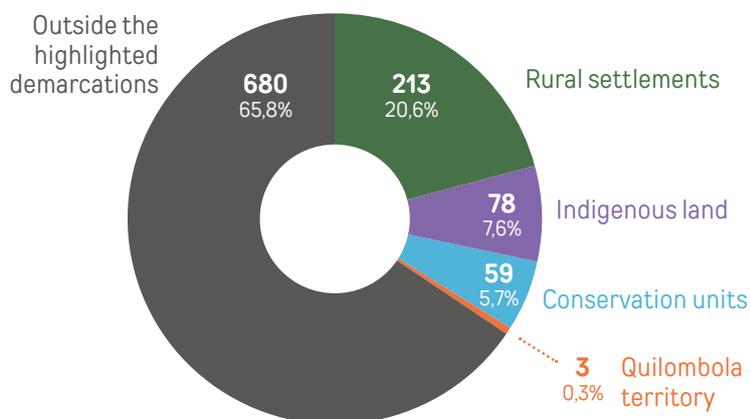
MAPPING OF THE POPULATION WITHOUT ACCESS TO ELECTRICITY IN THE AMAZON

To help reduce the existing knowledge gap, IEMA developed a model to estimate the population with no access to electricity in the Amazon region, divided by different groups: indigenous peoples, residents of extractive reserves, human settlements, and *quilombolas*. The results, which revealed an estimated one million people without access to electricity, subsidized Rede E&C in developing proposals for better regulations to provide universal access to electricity in remote Amazonian communities (<http://energiiaeambiente.org.br/um-milhao-estao-sem-energia-eletrica-na-amazonia-20191125>).

PUBLIC HEARING AT THE MINES AND ENERGY COMMISSION OF THE HOUSE OF REPRESENTATIVES

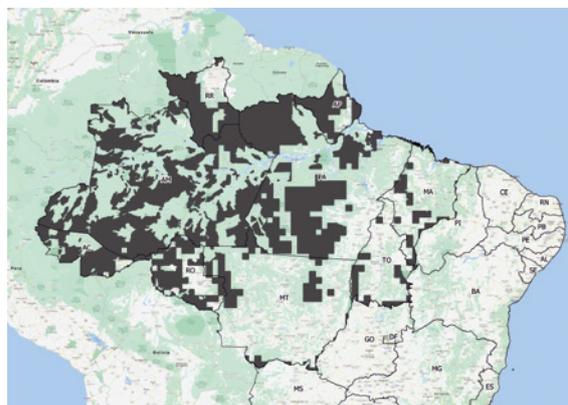
The results of the mapping of the population with no access to electricity in the Amazon were presented in a public hearing held by the Mines and Energy Commission of the House of Representatives to discuss how to put an end to electricity exclusion in Brazil. Also present at the hearing were representatives of Brazil's Ministry of Mines and Energy (MME) and the Brazilian Electricity Regulatory Agency (ANEEL).

AMAZON: POPULATION WITHOUT ACCESS TO ELECTRICITY ('000 RESIDENTS, %)



Regions with no access to electricity.

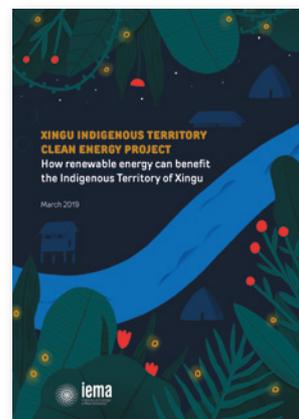
Illustrative map.



Source: IEMA.

PHOTOVOLTAIC SYSTEMS IN THE XINGU INDIGENOUS TERRITORY

Together with the Socio-environmental Institute (ISA), IEMA developed two studies about the “Xingu Solar” project, which installed **photovoltaic systems in the Xingu Indigenous Territory (TIX)**. The studies (a technical-economic analysis and an assessment of the project’s impacts) concluded that the installation of photovoltaic panels could rack up savings of more than R\$360,000 per year in electricity subsidies. It was also revealed that access to electricity had little interference in the traditional customs of indigenous communities, in addition to enabling more nighttime educational activities and increasing the sense of safety in terms of emergency medical services.



IEMA IN THE MEDIA

FOLHA DE S.PAULO

Amazonian communities swap diesel for solar energy

<https://www1.folha.uol.com.br/ambiente/2019/03/comunidades-na-amazonia-comecam-a-trocar-diesel-por-energia-solar.shtml>

ESTADÃO

Solar energy in Xingu reduces energy costs and changes the lives of indigenous people

https://www.em.com.br/app/noticia/nacional/2019/03/28/interna_nacional.1042035/energia-solar-no-xingu-reduz-gasto-com-energia-e-muda-vida-de-indigena.shtml

CHAMBER OF DEPUTIES

Commission discusses projects to end electricity exclusion

<https://www.camara.leg.br/noticias/616435-comissao-discute-projetos-para-acabar-com-a-exclusao-eletrica/>

PÁGINA 22

Nearly 1 million Brazilians have no access to electricity in the Amazon

<https://pagina22.com.br/2019/11/26/quase-1-milhao-de-brasileiros-nao-tem-acesso-a-energia-eletrica-na-amazonia/>

PODER 360

Nearly 1 million people have no access to electricity in the Legal Amazon region

<https://www.poder360.com.br/brasil/quase-1-milhao-nao-tem-acesso-a-energia-eletrica-na-regiao-da-amazonia-legal/>

G1

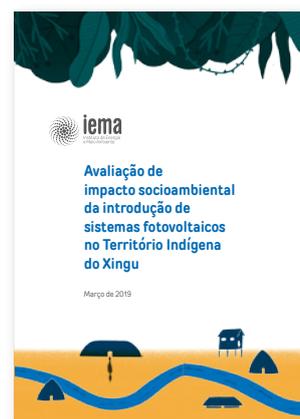
State of Pará has the most people living without electricity in the Legal Amazon, according to study

<https://g1.globo.com/pa/para/noticia/2019/11/26/para-e-o-estado-com-mais-pessoas-vivendo-sem-energia-eletrica-na-amazonia-legal-aponta-pesquisa.ghtml>

GALILEU

More than 990,000 people live without access to electricity in the Amazon region

<https://revistagalileu.globo.com/Tecnologia/noticia/2019/11/mais-de-990-mil-pessoas-vivem-sem-energia-eletrica-na-regiao-amazonica.html>



SOCIO- ENVIRONMENTAL IMPACTS OF THERMAL POWER GENERATION

IEMA has been working on a number of environmental studies and analysis of thermal power generation in Brazil: (i) collection and systematization of technical data from fossil-fueled thermal power plants in operation and in the process of obtaining environmental licenses; (ii) development of indicators for water consumption, air pollutant emissions, and greenhouse gases (GHG) emissions; and (iii) a study on alternative ways to reduce water consumption etc. The results of the work are made available to decision makers, non-governmental organizations and the media.

CONSUMPTIVE WATER USE IN BRAZIL – THERMAL POWER PLANTS

Through research of specialized literature and data from thermal power plants operating in various countries, IEMA developed a series of water use indicators to be applied in Brazil, considering the plant's thermodynamic cycle, conversion efficiency and cooling technology. These indicators were used by Brazil's National Water Agency (ANA) in its **Manual for Consumptive Water Uses in Brazil**, published in 2019. The manual is an integral part of a comprehensive study carried out by the ANA, providing estimates of consumptive water use in all Brazilian cities, including demand forecasts until 2030.



PUBLICATIONS ON THERMAL POWER PLANTS (TPPS)



THERMAL POWER PLANT PLATFORM

Since 2016, IEMA makes available its Energy Platform with technical and environmental information on thermal power plants powered by fossil fuels, with installed capacity of more than 100 MW, in operation or under construction. The Platform points each plant's location in the territory, providing technical information on each project: power cycle, fuel, cooling system, water use, and electricity generation per year. (<http://usinas.energiiaeambiente.org.br/>).

In 2019, in addition to updating the platform with the plants contracted in auctions, the mapping process included information from the National Water Agency (ANA) on basins that are considered critical in terms of water supply.

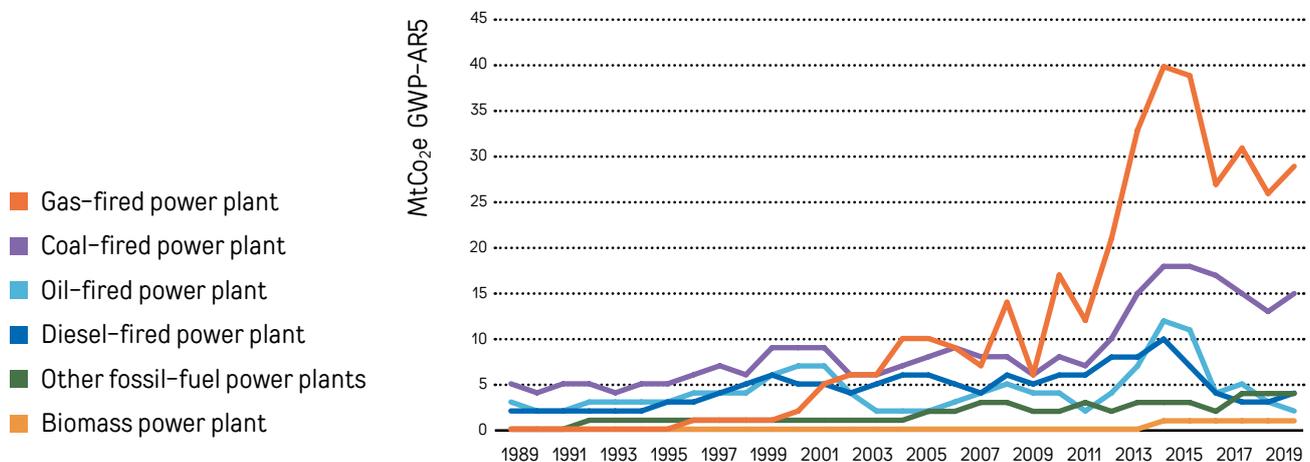
THERMAL POWER GENERATION EMISSIONS INVENTORY

Every year, IEMA publishes an inventory of atmospheric emissions from thermal power generation in Brazil. In 2019, 53,400 million tons of CO₂e were emitted by plants in operation, primarily those using natural gas, which accounted for 55% of total emissions.

The results of the inventory are disclosed every year in the Greenhouse Gases Emissions Estimates System (SEEG) (<http://seeg.eco.br/>), which provides data on emissions by energy source.

GHG EMISSIONS BY POWER SOURCE

Source: IEMA



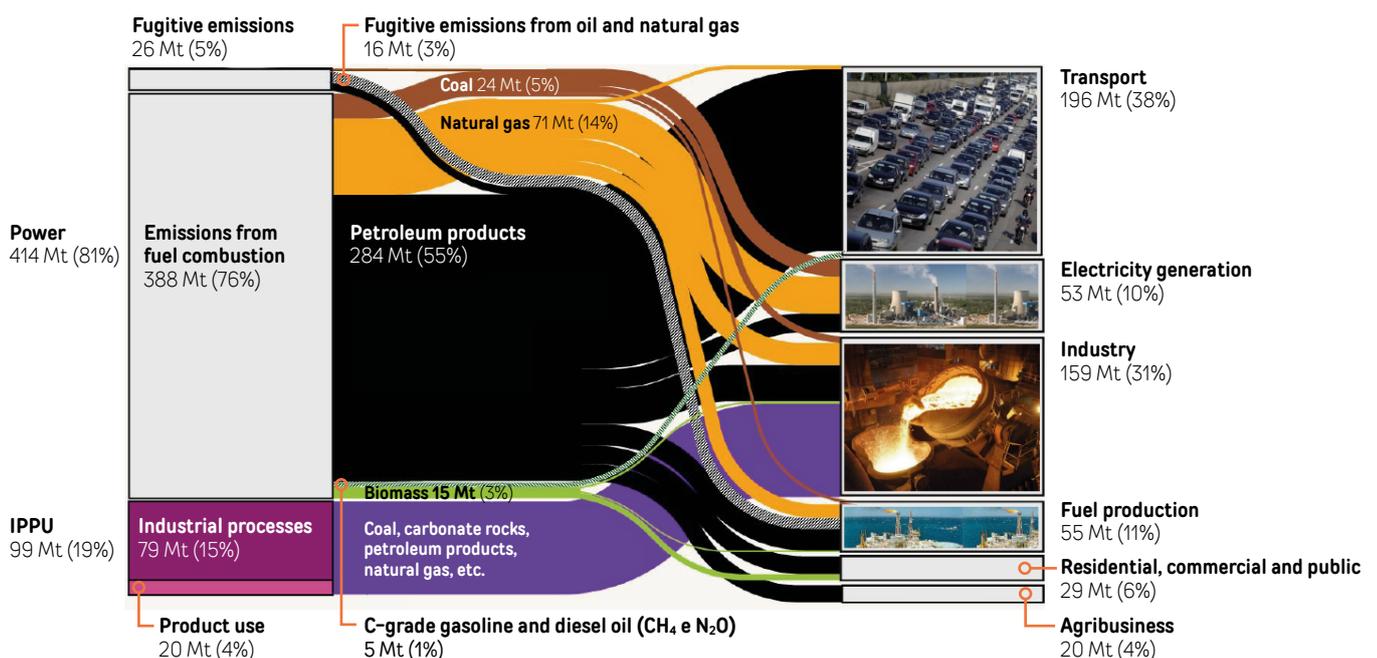
SPECIAL PROJECTS

SEEG

SEEG is a joint initiative by organizations of the Observatório do Clima, created to disclose information on Brazil's greenhouse gases emissions (<https://plataforma.seeg.eco.br/>). Since 2013, IEMA is responsible for the annual updates on emissions from the energy and industrial processes sectors, with track record dating back to 1970. Since 2014, SEEG is adopted by collectives from other countries. The first SEEG implemented outside of Brazil was in Peru, followed by India. Together with the other SEEG organizations, IEMA supported the initiative's implementation in these countries.

In 2018, SEEG published a scientific paper in the *Nature Scientific Data journal*, consolidating its role as Brazil's main source of information, broadly referred to by public entities, civil society organizations, the academic community and the private sector.

POWER EMISSIONS AND IPPU IN 2019: 513 MT CO₂e



David Tsai explains soil use at the Mapbiomas Award.



Promotion/ Mapbiomas

IEMA IN THE MEDIA

TV CULTURA

Global Warming

<https://www.youtube.com/watch?v=qefB2pl9RYY>

CANAL FUTURA

Is Brazil protecting the environment?

<http://www.futuraplay.org/video/o-brasil-tem-protetido-o-meio-ambiente/495249/>

FOLHA DE S.PAULO

Greenhouse gas emissions related to deforestation grow by 3.6% in Brazil

<https://www1.folha.uol.com.br/ambiente/2019/11/emissoes-de-gases-estufas-ligadas-ao-desmatamento-crescem-36-no-brasil.shtml>

VALOR ECONÔMICO

Instead of dropping, Brazil's gas emissions are climbing

<https://valor.globo.com/brasil/noticia/2019/11/06/em-vez-de-reduzir-pais-mantem-emissao-de-gases.ghtml>

MAPBIOMAS

The Brazilian Annual Land Use and Land Cover Mapping Project (MapBiomas) is an initiative by a collaborative network of NGOs, universities and tech companies with the goal of creating a track record of annual land cover and use maps in Brazil. This project aids the understanding of Brazil's land use dynamics. Since MapBiomas Collection 3, published in 2018, IEMA has contributed with the inclusion of geographic information layers about the country's transport and energy infrastructures (<https://mapbiomas.org/>).

Aligned with its strategic goals, IEMA uses data available on MapBiomas to work on energy and transportation topics, aiming to qualify the public debate on investment alternatives that consider socio-environmental issues in infrastructure development.

SUMMARY

INTRODUCTION

ABOUT IEMA

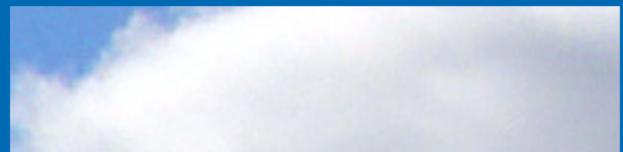
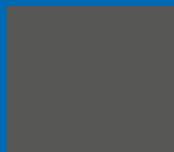
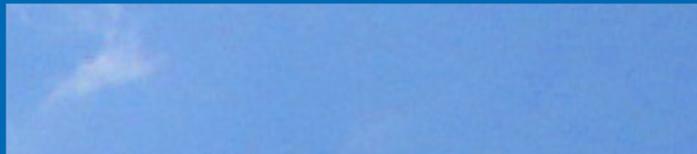
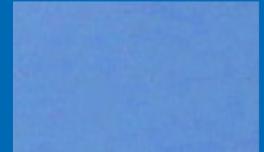
STRATEGIC GOALS
LINES OF ACTION

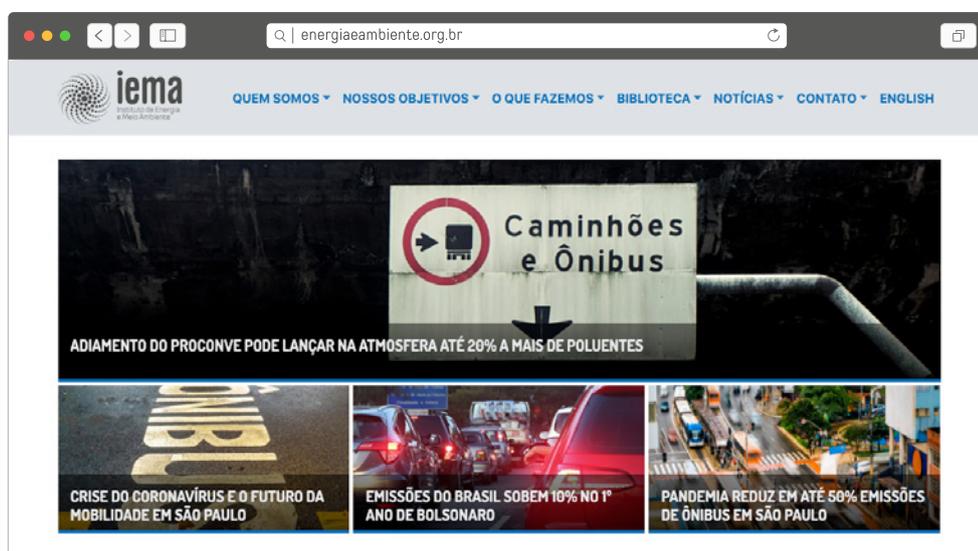
KEY ACHIEVEMENTS IN 2019

COMMUNICATION

SUPPORTERS AND
FINANCIAL INDICATORS

COMMUNICATION





In 2019, IEMA continued to consolidate its communication department. Supported by its technical production, the implemented initiatives generated concrete results, including **220 mentions in the press**. Some of the initiatives are listed below:

- Development and update of social media profiles for IEMA ([LinkedIn](#), [Facebook](#), [Instagram](#) e [Twitter](#)) and publication of four new videos on [Youtube](#), resulting in exponential growth in the number of followers.
- Publication of an **opinion piece** and participation in **TV shows**.
- Institutional **website** rebuilding and visitors profile tracking.
- Partnerships with the communication departments of other institutions and NGO networks.
- Closer relationship with the press, establishing a regular communication process with the media, especially by frequently sharing information with journalists about projects under development.
- Consolidation of the *IEMA Newsletter*, with **100% growth** in the number of subscribers.

SUMMARY

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STRATEGIC GOALS
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KEY ACHIEVEMENTS IN 2019

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SUPPORTERS AND
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SUPPORTERS AND FINANCIAL INDICATORS



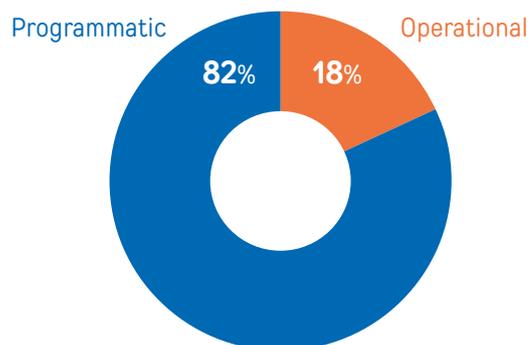


SUPPORTERS (2019)

Charles Stewart Mott Foundation
 Climate and Land Use Alliance
 Instituto Centro de Vida
 Instituto Clima e Sociedade
 Instituto Humanize
 Instituto Socioambiental
 Oak Foundation

FUNDS ALLOCATION

Team	R\$ 2.162.520
Third parties	R\$ 1.040.976
Travel/Conferences etc.	R\$ 244.748
Infrastructure/Operation	R\$ 211.129
General/Taxes	R\$ 19.452
TOTAL	R\$ 3.678.825



BALANCE SHEET

Fiscal years ended December 31, 2019 and 2018 (in reais)

ASSETS		2019	2018
Current	Cash and cash equivalents	3.821.189	3.877.306
	Advanced expenses	1.192	245.538
	Other accounts receivable	181.234	204.818
		4.003.615	4.327.661
Non-current	Property, plant and equipment	102.103	72.599
TOTAL		4.105.718	4.400.260

LIABILITIES AND SHAREHOLDERS' EQUITY		2019	2018
Current	Suppliers	85.270	32.639
	Tax liabilities	104.656	127.982
	Labor and social liabilities	226.794	197.197
	Advanced donations	1.303.657	1.590.451
		1.720.377	1.948.268
Shareholders' Equity	Corporate Equity	2.406.367	2.346.967
	Donations for Investment	45.625	45.625
	Surplus in the year	(66.651)	59.400
		2.385.341	2.451.992
TOTAL		4.105.718	4.400.260

STATEMENT OF INCOME

Fiscal years ended December 31, 2019 and 2018 (in reais)

		2019	2018
OPERATING REVENUE	Restricted		
	Revenue from Donations	3.534.605	5.595.506
	Non-restricted		
	Spontaneous Donations		381.349
	Other Revenue	1.394	59.976
	Volunteer Work	17.273	35.455
		3.553.272	6.072.285
PROJECT COSTS	Service Providers	(1.040.976)	(2.300.897)
	Personnel Expenses	(2.162.520)	(2.402.692)
	General	(455.876)	(1.292.278)
	Tax	(19.452)	(25.662)
		(3.678.825)	(6.021.529)
GROSS OPERATING SURPLUS		(125.553)	50.756
OPERATING EXPENSES	Volunteer Work	(17.273)	(35.455)
	General and Administrative Expenses	(71.613)	(84.286)
	Depreciation	(20.805)	(31.390)
		(109.691)	(151.130)
EARNINGS BEFORE REVENUE AND FINANCIAL EXPENSES		(235.244)	(100.374)
Financial Expenses		(45.268)	(54.122)
Interest Income		213.861	213.896
		168.593	159.774
SURPLUS FOR THE PERIOD		(66.651)	59.400

Fiscal year 2019 was audited by Audisa Auditoria e Consultoria and is available on the website (<http://energiaambiente.org.br/transparencia>).

Hyperlinks accessed on:
October 28, 2020.

SUMMARY	INTRODUCTION	ABOUT IEMA	STRATEGIC GOALS LINES OF ACTION
KEY ACHIEVEMENTS IN 2019	COMMUNICATION	SUPPORTERS AND FINANCIAL INDICATORS	



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1. Rafael Neddermeyer/Stock images, 2. Rodrigo Kugharski/Unsplash.