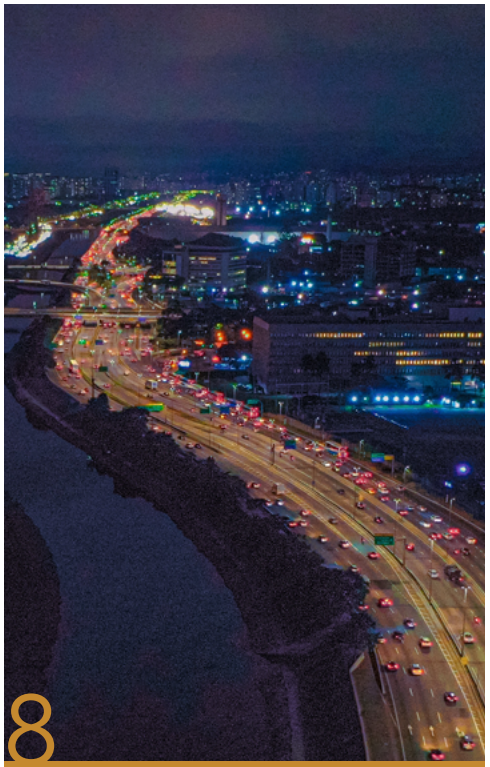
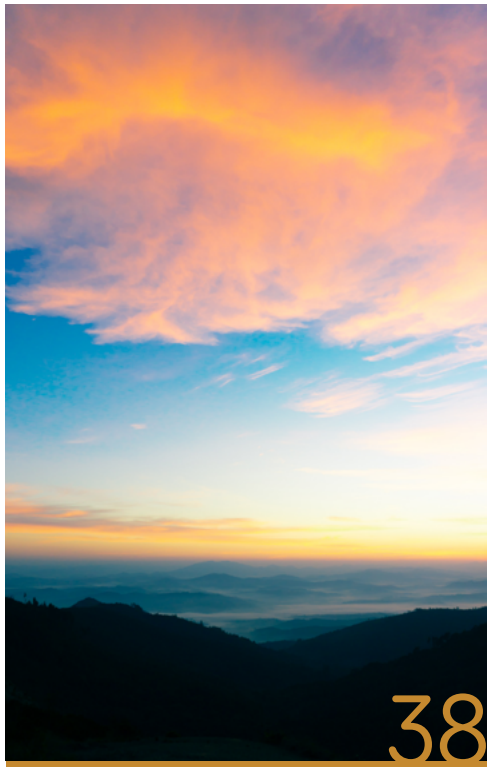
ANNUAL REPORT | 2021

15th years | IEMA

iema
Instituto de Energia e Meio Ambiente

SUMMARY





Opening

“When **we founded IEMA**, there were few environmental organizations dealing with **urban** issues. Today, we are no longer alone.”s”

André Luis Ferreira, director-president of the Instituto de Energia e Meio Ambiente (IEMA), talks about the space occupied by the organization in Brazilian society and how partnerships with civil society institutions, research institutions and municipalities can boost Brazil towards a fairer social and environmental future.

PHOTO: Pexels/Sergio Souza

How were the IEMA goals established in 2021?
IEMA has a strategic plan, in place since 2020, for the next two years, and it is guided by very consistent objectives. One of them concerns air quality and the ambition to reduce the concentration of air pollutants to levels recommended by the World Health Organization [WHO]. This is a long-term objective, as Brazil will not be able to reach this goal until 2024. In this regard, we have established two lines of action.

The first one is the Air Quality Platform, which was updated in 2021, incorporating new features to facilitate access to data generated from air quality monitoring carried out at stations across the country. From there, we put in practice the second line of action. We started to publish air quality bulletins in specific territories, starting with the municipality of Macaé, in Rio de Janeiro, where the information produced by IEMA was used in public hearings and assessment of the impact of thermoelectric plants in the city.

There is another objective related to urban mobility. How important is this topic?
IEMA's vision is that the compatibility of urban mobility with environmental issues cannot be restricted to the search for cleaner vehicles. It is necessary to go further and understand that when we talk about mobility, we also need to discuss ways to promote a fairer energy transition, prioritizing public transport and active transport, such as the use of bicycles. In addition to producing data on greenhouse gas (GHG) emissions from transport, it is essential to articulate ideas to mobilize and alert decision-makers and society in general about the possible risks of an ongoing revolution in the automobile industry: the articulation of this sector with that of digital technologies.

The association between automakers and large technology companies, the so-called big techs, seeks to expand the car market by spreading the idea that the car of the future will be a "mobile phone on wheels". Although such investments result in undeniable and impressive technological innovations, they are oriented towards individual transport – and this represents a risk, despite the effort to produce ever less polluting cars.

Depending on how it is incorporated into public policies, the technological leap in the automobile industry, based on the internet of things and embedded computer systems, could promote a conservative modernization of urban transport. Highly technological cars, connected to applications, tend to enhance individual mobilization, requiring the increasing allocation of areas of urban land for traffic and car parking, which can further deteriorate public space and increase the exclusion of people who do not have access to those goods and services.

Some transport apps argue that they are contributing to reducing people's interest in buying cars.
The number of car owners may even decrease dramatically in the coming years, but that does not mean that car use will follow the same trend. On the contrary: even those who don't know how to drive or don't have a car can use it through an app, without having to have a car in the garage. In this sense, problems such as congestion and pollution in big cities are not about owning vehicles, but about using them.

The technological effort of big techs would effectively contribute to sustainable urban mobility if it were also directed towards those who use public transport and active transport. We cannot bet, therefore, that clean and inclusive urban mobility will be achieved only with market forces. There must be public policies aimed at this objective.

What is IEMA's vision in relation to freight transport?
While passenger transport is predominantly concentrated in urban areas, freight transport occurs mostly at a regional level and is interurban, and this requires a look at the country's logistics infrastructure. In large countries, such as the United States, China and Russia, rail transport has a much greater weight than in Brazil. Here, the transport of freight takes place mainly by road, a system that proves to be more advantageous in smaller countries, for small distances.

Another aspect to be considered is the type of merchandise. Brazilian infrastructure prioritizes the transport of commodities, especially ores and grains, mostly soybeans. In this sense, even when there are investments in the construction of railways, they are aimed at a specific economic activity, and not at the country as a whole. It is therefore necessary to increase the use of railroads in the transport of other goods, not just commodities. IEMA has pointed to the need for investments in railroads that can carry the general freight that is currently transported on highways.

In recent years, investments in logistics have prioritized the transport of grains in export corridors located in the Amazon. IEMA has positioned itself in the sense of looking for alternatives, pointing out the need for investments in transport logistics that expand the use of ports further east of the national territory, avoiding the concentration of the flow of commodities through the ports of the Amazon, given the social and environmental risks that they impose on the region.

One of IEMA's flags is to promote clean and inclusive access to the power matrix. What does this mean concretely?
We understand that access to electricity is a social right, as is public transport. In this context, we have been working in the Amazon, where today most people without access to electricity in the country live. At the same time, the region needs a new economy that keeps the forest standing, based on biodiversity. Agroforestry systems, for example, can help reduce greenhouse gas emissions and benefit traditional communities and small farmers.

It happens that the infrastructure for the economy of the Amazon region is primarily geared towards agribusiness and mining, limiting investments in logistics and electricity to these activities. Programs dedicated to the expansion of electric energy in the region focus on residential lighting, but it is also necessary to generate electricity for the development of local productive arrangements.

Currently, part of the families depend on isolated systems to generate electricity, such as diesel engines. This model, however, is expensive and not sustainable. Bearing this in mind, IEMA has sought to contribute to the universalization of access to electricity through renewable means, such as solar photovoltaics, for example – a way of producing electricity without promoting the burning of fossil fuels.

In recent years, IEMA has enhanced its ability to foresee problems and anticipate the search for solutions. What factors contributed to this?
First of all, I understand that an organization like IEMA needs to be careful to make an effort not to be held hostage by a totally reactive agenda. In addition to reacting to setbacks, as is the case in the current context of dismantling environmental policies, it is necessary to reserve time and energy in order to conceive alternatives for the future. It is necessary to know how to look into the problems of the moment, without losing sight of the challenges that appear on the horizon.

PHOTO: Rovena Rosa / Agência Brasil

> “A subject that should gain more prominence in the coming years is the search for alternatives to the expansion of natural gas in the electricity sector”

This vision, incorporated early on by IEMA, is what leads us to build analysis instruments and generate data and information capable of subsidizing the improvement of public policies.

But it is necessary to recognize that, in the current moment of the country, marked by the advance of deforestation, successive cuts in the budget for science and lack of regulatory control in the environmental area, there is no way not to prioritize a position of resistance.

What themes should emerge from now on?
A subject that is already on IEMA’s radar, and should gain more prominence in the coming years, is the search for alternatives to the expansion of natural gas in the electricity sector. It is necessary to conceive a future for the electricity sector that is not based on the use of fossil fuels. The issue of logistics infrastructure and public transport should also become more evident, topics that are already part of IEMA’s objectives and on which we will focus more from now on.

How do you evaluate IEMA’s participation in the United Nations Conference on Climate Change (COP 26), held in November 2021?
Until recently, international negotiations to combat climate change were not part of IEMA’s scope of work, which has always focused more on the implementation of agreements at the domestic level. However, since 2019, we have sought to increase our degree of internationalization by approaching the global debate around environmental and climate issues.

The exchange of experiences and dialogue with organizations, scientists and institutions abroad is fundamental, and for this reason IEMA has expanded its presence in national and international collaboration networks. Our presence at COP 26 took place according to this perspective. We do not necessarily want to participate in international negotiations, but to show abroad the need to adapt the recommendations and agreements to the Brazilian reality, which is not trivial.

What are IEMA’s challenges for the coming years?
When IEMA was founded 15 years ago, there were few environmental organizations dealing with urban issues, especially mobility and pollution. The history of civil society institutions has always been more focused on the green agenda and on topics such as deforestation and land use. In this context, IEMA was born with the challenge of contributing to fill this gap.

For example, we help to put subjects such as vehicle technology and greenhouse gas emissions in transport on the agenda in the Brazilian public debate. Today, there are other national and international organizations, working with the urban agenda.

We are no longer alone and, therefore, one of the main challenges in the short term is to strengthen ties with other entities representing society and research institutions. This is essential for knowledge to be shared, increasing the impact of our actions on society and enhancing the results of our technical production.

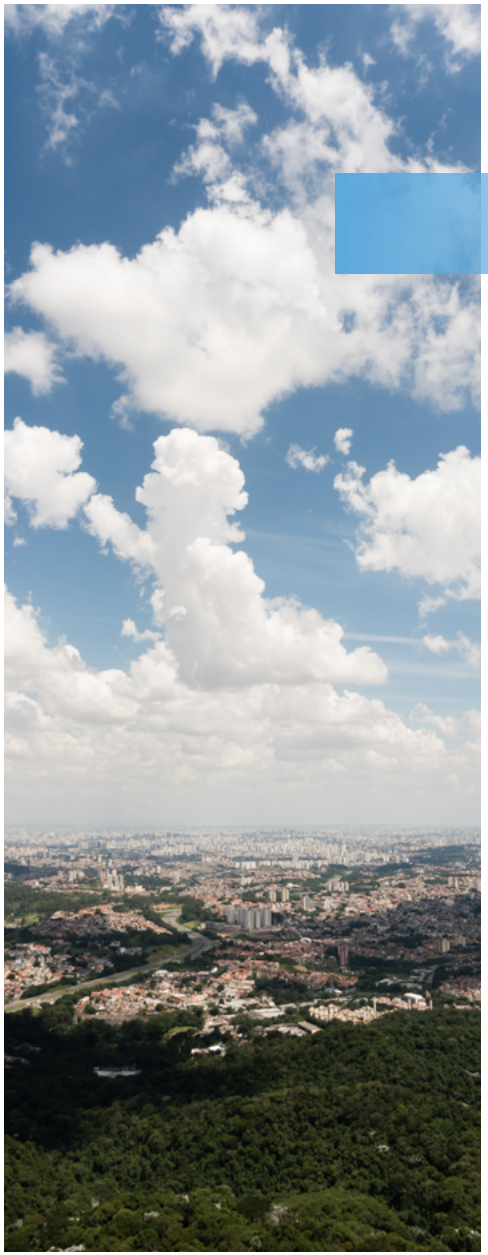


Photo: Pexels/Jackson David

IEMA

The Instituto de Energia e Meio Ambiente (IEMA), founded in 2006, is a non-profit organization based in São Paulo (SP). It is recognized for its role as a producer and disseminator of technical-scientific knowledge on issues of impact in the area of the environment. This broad set of information is important to support the elaboration and evaluation of public policies in sectors such as energy and transport, with a view to achieving social and environmental benefits.

This **Annual Report** presents the main activities carried out in 2021, with the commitment to transparency assumed throughout these 15 years of IEMA's history. In addition to the succinct description of IEMA's performance and its impacts, the financial and equity balance, the way in which resources are invested and the challenges that should guide the institute's work in the coming years are also explained. Good reading.

Purpose

To qualify the decision-making process so that transport and energy systems in Brazil ensure the sustainable use of natural resources along with social and economic development.

Values

GENEROSITY: cooperation and sharing of knowledge with society.

EXCELLENCE: appreciation for scientific rigor and independent thinking.

TRANSPARENCY: genuine openness and listening.

IMPACT: Focus on long-lasting and public interest-oriented transformations.

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PHOTO: ACN / FLickr

Strategic objectives

IEMA's activities are put into practice based on five Strategic Objectives, committed through transversal projects that cross some lines of action.

In order to achieve these five objectives, studies, analysis and meetings were carried out with partners, supporters and funders. Also noteworthy is the expansion of dialogue with the press and the intensification of collaborations and articulations with government agencies.

Particularly the fifth objective, Institutional Development, was defined with the purpose of improving and strengthening the areas of governance, management and communication at IEMA, including the training of personnel.

Strategic objectives

Objectives

CLEAN AIR

To improve air quality in large Brazilian urban agglomerations to the recommendations of the World Health Organization (WHO).

URBAN MOBILITY

To promote inclusive urban mobility and low emissions of atmospheric pollutants and greenhouse gases (GHG), which contribute to global warming.

REGIONAL SUSTAINABLE FREIGHT TRANSPORT

To reduce negative socio and environmental impacts related to freight transport.

CLEAN AND INCLUSIVE ELECTRICITY MATRIX

To promote universal access to electricity and reduce the negative social and environmental impacts generated by the expansion of the national electricity system.

INSTITUTIONAL DEVELOPMENT

Strengthen governance, management and communication and promote the personal development of the IEMA team.

Lines of action

- Inform society about **air quality**
- **Assess and propose** public policies for the energy transition in transport
- Support universal access to **electrical energy**
- Support to **strengthen and formulate** air quality policies
- Improve decision-making processes for **transport and logistics infrastructure**
- **Consolidate communication** and implementation of tools for monitoring impacts on society
- **Prepare inventories** of atmospheric pollutants and GHG emissions
- Improve decision-making processes for the **expansion of the electrical energy system**
- Improve **governance and management**

Ar limpo

To adapt air quality in large Brazilian urban agglomerations, following the recommendations of the World Health Organization (WHO)

Each year about seven million people die from complications associated with urban air pollutants, according to the World Health Organization (WHO). The effects of pollution on the health of the population are expressed in diseases such as bronchitis, asthma, cerebrovascular accident (CVA) and myocardial infarction – diseases that, when they do not kill, can considerably reduce the quality of life.

According to the new Global Air Quality Guidelines, released by the WHO in September 2021, it is necessary to act quickly on a set of pollutants, especially fine inhalable particles, also called particulate matter (PM), generated mainly by burning of fossil fuels in sectors such as transport, electricity, industry and agriculture.

PHOTO: Unsplash / Lucas Marcomini

All data gathered in the **Air Quality Platform** demonstrate that the monitoring carried out in Brazil is insufficient both in terms of spatial coverage and coverage by pollutants.

PM is a mixture of extremely small solid or liquid particles, with diameters ranging from a few nanometers to a few micrometers. The smaller the dimensions, the more easily they penetrate the respiratory tract, causing greater damage to health.

Despite the serious effects reported, air pollution is still not a priority agenda for public authorities in Brazil and other Latin American countries, as seen in one of the panels of the United Nations Conference on Climate Change (COP 26), held in November 2021 in Glasgow, Scotland.

Seeking to improve this situation, the Asociación Interamericana para la Defensa del Ambiente (AIDA) held a series of online debates. In the third and final meeting, IEMA participated alongside representatives from other countries on the continent, mainly addressing the monitoring of air quality and transparency in Brazil.

The Air Quality in Brazil

Two months before attending COP 26, IEMA made an important contribution to fighting pollution with the launch of a new version of the Air Quality Platform.

Its objective is to support public management of air quality, generate accessible information and promote science.

For this, IEMA, in partnership with public environmental agencies, collected data and information from the monitoring of air quality carried out by state or municipal governments throughout Brazil. The role of IEMA is to integrate, organize, analyze and make information available in order to support public policies and stimulate scientific production.

During its launch, IEMA issued an alert: only the Federal District and ten Brazilian states (Ceará, Pernambuco, Bahia, Goiás, Minas Gerais, Espírito Santo, Rio de Janeiro, São Paulo, Paraná and Rio Grande do Sul) have any of air quality monitoring device.

The states with the most adequate coverage, according to the **Air Quality Platform**, are Rio de Janeiro (with 125 stations), São Paulo (with 76 stations) and Minas Gerais (with 50 stations). At the stations, high concentrations of pollutants were often recorded, especially inhalable fine particulate matter (MP_{10} AND $MP_{2,5}$), ozone (O_3) and sulfur dioxide (SO_2).

NEW FEATURES

In order to present the news of the Air Quality Platform, IEMA organized a live show with the participation of representatives of institutions such as the WHO and the Ministry of Health. In addition to clarifying technical details about the operation of the platform, the event discussed ways to improve the monitoring of air pollution. Watch at https://bit.ly/3Kgb3A2

TOOLS

Tool gathers and standardizes air quality monitoring data generated by public authorities https://energiaeambiente.org.br/produto/plataforma-da-qualidade-do-ar

PHOTO: Divulgacao/IEMA

David Tsai, project manager, in the Summit of Peoples for Climate Justice

The new data visualization tools on the platform were presented on a webinar, with the participation of representatives of the Pan American Health Organization (PAHO, an arm of the WHO for the Americas), the Brazilian Association of State Environmental Entities (Abema) and Coalizão Respirar – a network that brings together more than 20 civil society organizations, including IEMA, which work together to defend air quality in Brazil.

Macaé (RJ)

An example of the platform's analysis potential is a technical note published by IEMA in December on air quality in Macaé, on the coast of Rio de Janeiro. We noticed that city dwellers breathed for 88 days in 2020 an amount of ozone (03) pollution above the WHO recommended level. According to data from SEEG Municipalities, two thermoelectric plants operating in Macaé were responsible for 41% of the total organic compounds (precursors for ozone formation) in the municipality in 2018.

In addition to technical notes, exchanges of information between partners and interviews with the press, IEMA also worked on the review of The Status of Air Quality in Brazil, a broad study coordinated by the World Resources Institute (WRI) and with the participation of scientists from several research institutions in the country, including the Physics Institute of the University of São Paulo (IF-USP) and the Alberto Luiz Coimbra Institute of Graduate Studies and Research in Engineering at the Federal University of Rio de Janeiro (Coppe/UFRJ).

Released in early 2021, the study estimates that air pollution could kill around 128,000 people between 2018 and 2025, in just six Brazilian metropolitan regions – where 23% of the country's total population live. The study also indicates juridical weaknesses in the control of air pollution.

Despite efforts to mobilize access to this kind of data, improving air quality depends on the formulation of a national air quality policy, capable of securing financial resources for monitoring pollution throughout the territory and guaranteeing sanctions for non-compliance. of legal or regulatory norms.

PUBLICATIONS

Technical Note: Air Quality in Macaé (RJ)
Planned installation of more thermoelectric plants could exacerbate air pollution
https://energiaeambiente.org.br/produto/nota-tecnica-qualidade-do-ar-em-macae-rj

Impact

It is worth mentioning that a bill (nº 10.521/2018) is already being processed in the National Congress, establishing the National Air Quality Policy and creating the National Air Quality Information System. The proposal underwent a first joint review by representatives of the industrial sector and the Coalizão Respirar, of which IEMA is a part. A new text of the Law Project, based on this revision, was approved by the Urban Development Committee of the Chamber of Deputies and, by December 2021, had been forwarded to the next committee, that of Environment and Sustainable Development.

In addition, the technical note on air quality in the municipality of Macaé subsidized a local group, made up of partners such as Instituto Internacional Arayara, to question and discuss the implementation of several natural gas thermal plants in the city.

PHOTO: Flickr/ Nicholas Bittencourt

Macaé, Rio de Janeiro

IN THE MEDIA

Agora São Paulo
North zone records poor air quality and São Paulo does not have a region with a positive index
https://agora.folha.uol.com.br/sao-paulo/2021/08/zona-norte-registra-qualidade-pessima-do-ar-e-sao-paulo-nao-apresenta-regiao-com-indice-positivo.shtml

Estadão
City of SP records 'terrible level' of air quality for the 1st time since 1996
https://noticias.uol.com.br/ultimas-noticias/agencia-estado/2021/08/24/cidade-de-sp-registra-nivel-pessimo-de-qualidade-do-ar-pela-1-vez-desde-1996.htm?cmpid=copiaecola

TV Globo/ SP1
World Car Free Day is celebrated this Wednesday
https://g1.globo.com/sp/sao-paulo/videos-sp1/edicao/2021/09/22/videos-sp1-de-quarta-feira-22-de-setembro.ghtml#video-9882279-id

Valor Econômico
WHO launches global guideline for better air qualityr
https://valor.globo.com/brasil/noticia/2021/09/23/oms-lanca-diretriz-global-por-qualidade-melhor-do-ar.ghtml

Yahoo! Notícias
Few Brazilian states monitor air quality, study finds
https://br.financas.yahoo.com/noticias/poucos-estados-brasileiros-monitoram-qualidade-030500599.html

PHOTO: Rovena Rosa/Agência Brasil

Low emission urban mobility

To promote inclusive urban mobility and low emissions of atmospheric pollutants and greenhouse gases (GHG)

Along with air pollution, the priority given to individual transport is another factor that undermines the health of Brazilian cities, especially in large urban centers, which also suffer from increased congestion and immobility on public roads. The expansion of car use has a direct impact on both local pollutant emissions and greenhouse gas (GHG) emissions, including carbon dioxide (CO_2), resulting mainly from the burning of fossil fuels, including gasoline and diesel.

Low emission urban mobility

PHOTO: Pexels/Bran Sodre

The gradual accumulation of greenhouse gases in the atmosphere is the main cause of global warming. It should be noted that, since the end of the 19th century, the average global temperature has risen by around 1.1 degrees Celsius (°C) – and this has been changing the climate across the planet. If GHG emissions are not reduced in the short term, the Earth could warm up to 4°C this century, according to projections by the Intergovernmental Panel on Climate Change (IPCC). This scenario can lead to a greater occurrence of extreme events, such as heat waves, long droughts and intense rains that increase the risk of floods, such as those that happened in southern Bahia at the end of 2021.

In this sense, encouraging the replacement of fossil fuels by renewable sources is essential to face climate change. However, the use of cleaner energy sources alone does not solve the problems of urban mobility. Even if the car fleet were completely renewed, with electric vehicles and engines powered by biofuels, the insistence on the use of this type of transport perpetuates other obstacles, such as congestion, traffic accidents and reduced accessibility for low-income populations. All this represents a great social and economic cost.

Therefore, IEMA emphasizes the importance of expanding low-carbon public transport – which can be achieved in different ways. One of the organization's objectives, therefore, is to assess the impacts of different scenarios and relevant public policies in order to effect the transition to inclusive urban mobility and low pollutant emissions.

Public transportation

Among the initiatives promoted in this line in 2021 is ReFrota, a spreadsheet-like calculator developed by IEMA in partnership with São Paulo Transporte (SPTrans), an autarchy that manages the bus lines in the capital of São Paulo. Through ReFrota, it is possible to estimate monthly and annual GHG and pollutant emissions from public buses that circulate in São Paulo. The municipality is the one that emits the most GHGs in the Southeast region, with 17.9 million tonnes of carbon dioxide equivalent (CO_2e) released in 2018, according to SEEG Municipalities. About 69% of emissions come from the energy sector, mainly from the consumption of fossil fuels in transport.

The initial objective of ReFrota is to help bus operators in the capital of São Paulo to report to SPTrans the emissions generated in the previous year by their

HOW ARE THE BUSES IN SÃO PAULO

IEMA produced a video about the Monitor de Ônibus SP, which allows the user to obtain information such as the speed of buses, the number of passengers and the levels of pollutant emissions. The tool serves as the basis for the publication of the Bulletin of the Monitor de Ônibus SP, whose data from April 2021, for example, indicated a constant increase in the average number of passengers per day during the Covid-19 pandemic.
Watch at https://bit.ly/3ula2kS

INCLUSIVE MOBILITY

A video was made available presenting the results of the Transition study of the Brazilian automotive industry and debating the current challenges for the international automotive sector.
Watch at https://bit.ly/3vW3Dx6

ARTICLES

The urgent resumption of public transport in São Paulo
(Le Monde Diplomatique Brasil)

Challenges for urban mobility in the era of Industry 4.0
(Nexo Políticas Públicas)

Low emission urban mobility

PHOTO: Rovena Rosa/Agência Brasil

REFROTA

TOOLS

ReFrota: emission calculator for bus fleets
Tool estimates monthly and annual emissions from public bus fleets
https://energiaeambiente.org.br/produto/refrota-calculadora-de-emissoes-de-frotas-de-onibus

respective fleets. These data are relevant to comply with municipal law Nº. 16,802 of 2018, which provides for the reduction of pollutant and GHG emissions by urban public transport in São Paulo. ReFrota is one of the three IEMA tools aimed at improving the public transport system in São Paulo. The others are the PlanFrota calculator and the Monitor de Ônibus SP, both launched in 2020.

This year, bimonthly, IEMA published on its website, on social networks, for the press and decision makers the special Bulletin Monitor de Ônibus SP, with analyzes based on information taken from the tool of the same name. It was produced to monitor the evolution of emissions and operating indicators such as bus transport speed and fleet in the city of São Paulo.

The September Bulletin warned of the reduced number of electric buses circulating in the metropolis: only 219 vehicles, a mark well below the target of 2,620 electric buses scheduled to run in 2021. On the other hand, the document signaled a recovery in the supply of public transport to the citizens of São Paulo, pointing out that the total mileage traveled by buses increased in August compared to January last year.

Automotive industry

One cannot discuss mobility problems without taking into account the transition that the automotive industry is going through in Brazil and in the world.
The technological development of vehicles (with a focus on electrification, automation and on-board connectivity) can contribute to the necessary reduction of pollutant and GHG emissions. However, it does not represent a good strategy to face other challenges, such as the unequal and unfair use of road space, which ends up restricting the right to the city.

This is what the study Transition of the Brazilian automotive industry indicates, produced by IEMA in partnership with the Rosa Luxemburgo Foundation. The work, released in May 2021, highlights the challenges and prospects for the industry's conversion to be more committed to inclusive and low-emission mobility.

One of the aspects analyzed in the research is that most automakers are getting prepared for a new market dynamics, in which the offer of car rental, subscription and transport services through apps stands out. This dynamic must profoundly change the urban mobility system.

SP BUS MONITOR:

- **First edition:** Buses in São Paulo are more environmentally efficient https://energiaeambiente.org.br/boletim/monitor-de-onibus-sp
- **Second Edition:** Average number of passengers per day increased by 300,000 from January to February https://energiaeambiente.org.br/boletim/numero-medio-de-passageiros-por-dia-aumentou-em-300-mil-de-janeiro-para-fevereiro
- **Third edition:** Buses are being renewed and circulating more, but zero emission technology in the fleet is shy https://energiaeambiente.org.br/boletim/boletim-monitor-de-onibus-sp-terceira-edicao

Low emission urban mobility

PHOTO: Flickr / Milton Jung

One of the main effects, according to the study, is the emergence of services that compete mainly with public transport, internationally known as Mobility as a Service (MASS). The authors argue that in Brazil the concept of Mobility as a Right must be defended. The research was carried out through document analysis and interviews with representatives of the sector.

In an article published in July on the Nexo Políticas Públicas portal (Challenges for urban mobility in the age of industry 4.0), the IEMA team responsible for the study defended a political direction capable of improving public transport and generating jobs and income from the construction of dedicated infrastructure and the manufacture and operation of vehicles. The topic was also addressed by David Tsai and Felipe Barcellos, researchers at IEMA, in an article published on the website of the newspaper Le Monde Diplomatique Brasil on September 22, World Car-Free Day.

Electric buses

In 2021, a new version of the E-Bus Radar, a tool developed by the Laboratory for Sustainable Mobility at the Federal University of Rio de Janeiro (LABMOB/UFRJ), in collaboration with IEMA, came on air. The tool is used to monitor fleets of electric buses and their respective avoided emissions. The new version presents data on buses in operation in September 2020 in 30 Latin America cities. In the whole of Brazil, for example, there are only 349 public buses powered by electricity.

IN THE MEDIA

Ecoa/ UOL
Faster buses in SP have less impact on the environment, study shows
https://www.uol.com.br/ecoa/ultimas-noticias/2021/02/12/onibus-mais-velozes-em-sp-tem-menos-impacto-no-meio-ambiente-mostra-estudo.htm

Diário do Nordeste
A study of the future of the automobile
https://diariodonordeste.verdesmares.com.br/opiniao/colunistas/egidio-serpa/para-crescer-ceara-deve-focar-em-educacao-e-pesquisa-diz-maia-jr-1.3104408

Diário do Transporte
Environmental tool allows you to create a report on emissions from public transport buses in São Paulo
https://diariodotransporte.com.br/2021/03/26/ferramenta-ambiental-permite-criar-relatorio-de-emissoes-dos-onibus-do-transporte-publico-de-sao-paulo/

Mobilize EXPRESSO #36
The gains (and losses) of the new Brazilian Traffic Code
https://anchor.fm/mobilize/episodes/EXPRESSO-36-Os-ganhos-e-perdas-do-novo-Cdigo-de-Trnsito-Brasileiro-ev1qm1

Low emission urban mobility

PHOTO: Marcelo Camargo / Agência Brasil

Bike share

Bike-share systems can be allies in the fight against the emission of pollutants and greenhouse gases. The analysis is part of a book released by the Sustainable Mobility Laboratory of the Federal University of Rio de Janeiro (Labmob-UFRJ). In one of the chapters of "Bicycles in cities: Experiences of sharing, diversity and technology" (*Relicário Edições, 2021*), IEMA researchers David Tsai, Felipe Barcellos, Hellem Miranda and Marcelo Cremer reflected on the role of bicycles in combating to pollutant emissions in a metropolis like São Paulo.

The text presents the results of an IEMA study that estimated the CO_2 and particulate matter emissions avoided by Bike Sampa, a bicycle sharing system available in São Paulo. There was a reduction of 0.04% in the region of operation of Bike Sampa, a percentage that is only apparently timid, according to the research, which was detailed in a webinar in February 2021. According to the authors, the use of bicycles has a potential of considerably greater reduction in emissions if the scenario of few incentives for this type of transport is reversed.

Impact

ReFrota seeks to support the reporting of emissions from public transport system fleets. Thus, the calculator has been used by Empresa Metropolitana de Transportes Urbanos de São Paulo (EMTU) to estimate emissions from its fleet.

PUBLICATIONS

Three tools to support the progress of urban mobility
https://energiaeambiente.org.br/produto/tres-ferramentas-para-apoiar-o-progresso-de-uma-mobilidade-urbana-inclusiva-e-de-baixas-emissoes

Transition of the Brazilian automotive industry: challenges and prospects for a conversion aligned to inclusive and low-emissions mobility
Study discusses the transition that the Brazilian automotive industry is going through and the prospects for urban mobility
https://energiaeambiente.org.br/produto/transicao-da-industria-automotiva-brasileira-desafios-e-perspectivas-para-uma-conversao-alinhada-a-mobilidade-inclusiva-e-de-baixas-emissoes

TV Record
Against overcrowding, SP should increase its bus fleet, indicates institute
https://noticias.r7.com/sao-paulo/contra-lotacao-sp-deve-aumentar-frota-de-onibus-indica-instituto-15042021

Diário do Transporte
Modernization of the automotive industry in Brazil with a focus on electrification, automation and connectivity moves towards social exclusion
https://diariodotransporte.com.br/2021/07/02/modernizacao-da-industria-automotiva-no-brasil-com-foco-em-eletrificacao-automacao-e-conectividade-caminha-na-direcao-da-exclusao-social/

Valor Econômico
Study points to risk of elitist electric car
https://valor.globo.com/brasil/noticia/2021/07/05/estudo-aponta-risco-de-elitizacao-do-carro-eletrico.ghtml

TV Globo/ SP2
São Paulo has only 8.3% of electric buses scheduled to run in the city in 2021
https://g1.globo.com/sp/sao-paulo/videos-sp2/edicao/2021/09/26/videos-sp2-de-sabado-25-de-setembro.ghtml#video-9892959-id

TV Globo/ SP2
Capital wants 20% of the bus fleet to be zero carbon by 2024
https://globoplay.globo.com/v/10032676/

Regional Sustainable Freight transport

PHOTO: Flickr / Diego Torres Silvestre

Reducing negative social and environmental impacts related to freight transport.

The transport sector in Brazil accounts for 45% of the data associated with greenhouse gas emissions, according to the System of Estimates of Greenhouse Gases and Greenhouse Gas Removals (SEEG). One of the reasons for this higher share is that Brazilian freight transport is highly dependent on road transport and the use of fossil diesel oil.

In addition to greenhouse gas emissions, there are other relevant social and environmental issues related to freight transport in Brazil that have not been

Regional Sustainable Freight transport

PHOTO: Pexels/Uhgo

PHOTO: Marcelo Camargo / Agência Brasil

adequately considered in the early stages of the decision-making process for the implementation of infrastructure (roads, railways, waterways, ports), threatening the well-being of communities and the environmental preservation of vulnerable territories.

In the search for solutions to some socio-environmental challenges of freight transport in Brazil, IEMA produces and systematizes technical knowledge with a view to strengthening spaces for dialogue that seek to: expand modal diversity through transfer to high-capacity and more efficient modes – rail and waterway; replacement of petroleum-derived fuels by other energy sources with lower intensity of atmospheric emissions; and incorporating social and environmental risks into the policy, planning and regulation of freight transport and associated infrastructure.

In 2021, IEMA had an intense presence in the debate on freight transport, especially regarding the movement to expand the transport of agricultural commodities towards the ports of the so-called Northern Arc of the Amazon.

The stimulus to export agricultural commodities, especially soybeans, via Northern Arc is provided for in the current National Logistics Plan (NLP) and may affect an area that still contains several endemic animal and plant species. The place is also inhabited by traditional communities, such as indigenous populations and quilombolas. In IEMA's view, the bet on outflowing through the North region needs to be reviewed and, in this sense, reinforces the need for evaluations of alternatives for the flow of production through ports in the East of the country, specifically in the Northeast and Southeast regions.

DEBATE

At the event "Green corridors for soy: the sustainable route to China", held by the Instituto O Mundo Que Quero, André Ferreira, IEMA's president-director, stressed that it is necessary to compare a series of alternatives to discuss the critical points of infrastructure from the country. At the meeting, representatives from academia, the Federal Audit Court (TCU) and the Brazilian Navy spoke.

MORE STUDIES AND SOCIAL PARTICIPATION

IEMA produced a video on the need for more analysis of the social and environmental impacts of large infrastructure works, such as highways, railways, hydroelectric and thermoelectric plants. The importance of involving local communities in government decision-making processes is also discussed, ensuring that the population can contribute from the initial stages of risk assessment and planning of activities.
Watch at https://bit.ly/3v0Fkwq

PUBLICAÇÃO

EPL-IEMA methodology for GHG emissions and local pollutants
See data on the current situation and future evolution of GHG emissions from freight transport in Brazil
http://energiaeambiente.org.br/produto/metodologia-epl-iema-para-emissoes-de-gee-e-poluentes-locais

Regional Sustainable Freight transport

PHOTOS: Marcelo Camargo / Agência Brasil

For IEMA, therefore, the decarbonization of freight transport cannot be achieved only by substituting or privileging one modal over another (more trains instead of trucks). It is necessary to take into account the territories where logistics infrastructure is intended to be installed, even if they are lower emission modes of transport such as railroads. Depending on the region, new ventures can generate deforestation and even increase total GHG emissions.

In an event promoted by GT Infra – Infrastructure and Socio-Environmental Justice, experts discussed the PNL for 2035. The online event discussed the government's proposal and, aiming to build a strategy in which national logistics better meets the public interest, reflected on the existing gaps in the NLP In an interview with GT Infra's podcast, Sustainable Infrastructure, IEMA director André Luis Ferreira spoke about the need for alternative scenarios for the logistics sector.

It's been a long time since this concern is on IEMA's radar. Between 2017 and 2019, the institute prepared a study within the scope of the Technical Cooperation Agreement formed with the Planning and Logistics Company (Empresa de Planejamento e Pesquisa – EPL), linked to the Ministry of Infrastructure, with the objective of evaluating the current situation and future evolution of GHG emissions of freight transport in Brazil. A first result of this partnership is the EPL-IEMA Methodology for GHG emissions and local pollutants, released in 2021. The document presents estimates for current and future emissions, considering the 2025 PNL.

André Luis Ferreira, director of IEMA, has been debating in different groups about the importance of analyzing alternatives for the infrastructure decision-making process. In a webinar of the Group of Studies, Research and Socioeconomic Extension of the Amazon (Gepesa), of the Federal University of Western Pará (Ufopa), he addressed the logistical scenarios of the Amazon.

PHOTO: Pexels/Jonathan Borba

Clean and inclusive electricity matrix

Universalizing access to electricity

The public electricity service still does not serve the entire Brazilian population. According to an estimate made by IEMA, in the Amazon region alone, about one million people still live in a situation of electrical exclusion. The resources made available by government programs for the universalization of electric energy have been relatively scarce and have been used only to reach residential consumption, not taking into account the possible demands for local productive activities. Expanding access to electricity is essential to promote social and economic development.

Clean and inclusive electricity matrix

The Federal Constitution does not explicitly mention access to electricity as a fundamental right, but states that the rights determined therein do not disregard the "dignity of the human person". In this sense, it is possible to characterize access to electricity as a fundamental right. However, the public electricity service still does not serve the entire Brazilian population. In the Amazon region alone, about one million people still live in a situation of electrical exclusion. Resources made available by government programs are relatively scarce and do not take into account the demands of local productive activities.

Electricity in the Legal Amazon

IEMA is a member of the Energy and Communities Network, which works towards sustainable regional development in the Amazon. During 2021, we actively participated in fortnightly meetings and debates promoted by the Network. Among the works carried out, a biweekly radio program was launched and also published in a podcast addressing social, environmental and technical issues related to access to electricity. The group contributed by submitting proposals for the improvement of energy auctions in isolated communities, through the Public Consultation 120/2022. IEMA also joined the Permanent Energy Forum, encouraged by the Federal University of Amazonas (UFAM), to discuss energy in the Amazonian states.

PHOTO: Unsplash/Nareeta Martin

André Luis Ferreira and Felipe Barcellos e Silva, both researchers at IEMA, published the scientific article "Universalization of access to the public electricity service in Brazil: recent evolution and challenges for the Legal Amazon" in the Revista Brasileira de Energia. The text identifies gaps in the configuration and implementation of the National Program for Universal Access to and Use of Electricity in the Legal Amazon – More Light for Amazon (MLA), launched by the Federal Government in 2020, and recommends improvement points.

In 2021, the georeferenced methodology carried out in the two previous years was published to monitor the evolution of the number of people without access to electricity in the Legal Amazon.

AMAZON IN THE DARK

IEMA produced a video detailing the problem of electricity shortages in the Amazon. The analysis shows that more than 990,000 Brazilians are without access to public electricity services in the states of the Legal Amazon.
Watch at https://bit.ly/398otjQ

PUBLICATIONS: ACCESS TO ELECTRICITY IN THE AMAZON

Legal Amazon: who is without electricity
Analysis carried out by IEMA shows that 990,103 Brazilians are without access to public services
https://energiaeambiente.org.br/produto/amazonia-legal-quem-esta-sem-energia-eletrica

- **Electricity exclusion in the Legal Amazon: who still has no access to electricity?**
Spatial model points out the locations where people live without public electricity in the Legal Amazon
https://energiaeambiente.org.br/produto/exclusao-eletrica-na-amazonia-legal-quem-ainda-esta-sem-acesso-a-energia-eletrica

Clean and inclusive electricity matrix

PHOTO: Unsplash/James Cheung

Reducing the negative social and environmental impacts generated by the expansion of the national electricity system.

In addition to the growth in GHG emissions, the expansion of thermoelectricity increases the risks to public health due to air pollution, also it might exacerbate conflicts over water use and put pressure on fees paid by consumers. Considering this situation, IEMA has produced technical knowledge in order to contribute to qualify the debate in society in two complementary directions: proposing alternatives to fossil fuels in the expansion of the Brazilian electricity matrix and incorporating social and environmental risks in the planning and regulation of the expansion of the electric system.

A survey produced by IEMA for the television station CNN Brasil showed that, from 2020 to 2021, Brazil increased its CO_2 emission by burning fossil fuels used in thermoelectric plants by 121%, considering the first nine months of each year. In 2019, fossil thermoelectric plants generated 46.5 terawatts-hour (TWh) between January and September. In 2021, in the same mentioned interval of months, the amount generated almost doubled, reaching 81.2 TWh. Currently, before and after each electricity auction, IEMA publishes information about the plants registered and contracted in these events.

The inclusion of the contracting of thermoelectric plants within the Provisional Measure (MP) 1,031/2021, referring to the privatization of Eletrobras, sanctioned in July by the Presidency of the Republic and converted into the Law 14,182/2021, was also studied. According to the analysis, annual greenhouse gas emissions will increase by at least 17.5 MtCO●, representing a percentage increase of 32.7% over the electricity sector-wide emissions recorded in 2019.

Water crisis

In 2021, the situation was exacerbated by the worst water crisis recorded in Brazil to date. The lack of rain put at risk the electricity generation capacity of hydroelectric plants, the main generating source in the country, responsible for more than 60% of all electricity produced. With reservoirs at a low level, the main measure adopted by the Ministry of Mines and Energy (MME) was to expand electricity generation in thermoelectric plants, which

PUBLICATIONS: IMPACT OF THERMOELECTRIC PLANTS

Questions regarding the insertion of natural gas thermoelectric plants in Provisional Measure 1031/2021
Eletrobras: contracting of thermoelectric plants in full-time operation may increase emissions
https://energiaeambiente.org.br/produto/questionamentos-a-insercao-de-termeletricas-a-gas-natural-na-medida-provisoria-1-031-2021

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Environmental impacts arising from the insertion of natural gas thermoelectric plants in Provisional Measure 1031/2021
Learn about the environmental implications of the inclusion of natural gas thermoelectric plants in the Eletrobras privatization text
https://energiaeambiente.org.br/produto/impactos-ambientais-decorrentes-da-insercao-de-termeletricas-a-gas-natural-na-medida-provisoria-1-031-2021

●

Hidric crisis, thermoelectric and renewable sources
Considerations on energy planning and its environmental and climate impacts
https://energiaeambiente.org.br/produto/crise-hidrica-termeletricas-e-renovaveis

Clean and inclusive electricity matrix

PHOTO: Flickr/EletrobrasFurnas

ARTICLES

Green recovery against the red flag
(Valor Econômico)

Emphasis on thermoelectric plants: risk to the pocket and the environment
(Gazeta do Povo)

are more expensive and polluting, as they work with the burning of fossil fuels, including coal.

Brazil's dependence on the model based on hydroelectric plants is worrying, even more so when one observes that the river basins have been suffering, in recent years, the effects of climate change, more recently aggravated by deforestation. It is understood that, in order to face and overcome the crisis, it is necessary to diversify the national electricity matrix, prioritizing renewable sources, such as photovoltaic solar and wind energy. For this, in addition to investing in infrastructure, it is also necessary to produce more studies on the environmental and social impacts of renewable energies, such as the installation of wind farms.

Energy planning

At the height of the 2021 water crisis, IEMA published a technical note, warning of the consequences of using thermoelectric plants full-time. According to the document, the perennialization of thermoelectric plants, in situations of severe drought, can be expected to increase greenhouse gas emissions in the sector, in addition to environmental impacts on air quality. It is recommended that energy planning review the criteria for contracting energy in the medium and long term, avoiding the cancellation of auctions in the regulated environment or the low contracting as seen in the last auctions of new and existing energy.

Electricity auctions

In order to qualify the public debate on social and environmental risks of electricity

BULLETINS ON ENERGY AUCTIONS

Prior analysis of the Existing Energy Auctions (LEE) A-4 and A-5 of June 25, 2021
https://energiaeambiente.org.br/produto/analise-previa-dos-leiloes-de-energia-existente-lee-a-4-e-a-5-de-25-de-junho-de-2021

- Análise prévia do Leilão de Energia Nova (LEN) A-5, de 30 de setembro de 2021
https://energiaeambiente.org.br/produto/analise-previa-do-leilao-de-energia-nova-len-a-5-de-30-de-setembro-de-2021
- Prior analysis of the Capacity Reservation Auction, of December 21, 2021
https://energiaeambiente.org.br/produto/analise-previa-do-leilao-de-reserva-de-capacidade-de-21-de-dezembro-de-2021
- First edition: Thermoelectric plants can be activated full time increasing emissions
https://energiaeambiente.org.br/boletim/boletim-leilao-de-energia-eletrica-a-4-e-a-5-de-energia-existente
- Second edition: Northeast and Southeast concentrate the largest number of fossil fuel plants registered in the auction
https://energiaeambiente.org.br/boletim/boletim-leilao-de-energia-segunda-edicao
- Third edition: First capacity reserve auction restricts contracting to thermoelectric plants
https://energiaeambiente.org.br/boletim/boletim-leilao-de-energia-terceira-edicao

Clean and inclusive electricity matrix

PHOTO: Pexels/kaique Rocha

PHOTO: Flickr/Camila DominguesPalácio Piratini

generation, IEMA launched the first Electric Energy Auction Bulletin on the auctions for the sale and purchase of energy that take place periodically in Brazil. Among the different thermoelectric plants registered to participate in the auctions, 36 proposed the use of water in their cooling systems. This fact was a point of attention since about 70% to 80% of the water captured by thermoelectric plants does not return to the watershed. In the technical note "Questions to the insertion of natural gas thermoelectric plants in the Provisional Measure 1.031/2021", IEMA argued that, if the text on the contracting of full-time thermoelectric plants, which is linked to the privatization of Eletrobras, were approved, there would be an increase of 17. 5 million CO_2e, or 33% increase, over 2019 emissions.

DEBATE

Ricardo Baitelo, project manager at IEMA, participated as an interviewer on the program Roda Viva (TV Cultura) that hosted Wilson Ferreira Jr, former president of Eletrobras. On the occasion, it sought to address topics on a cleaner electricity matrix and the environmental impacts of the increase in thermoelectric plants.

IN THE MEDIA

G1
Rondônia has more than 100 thousand people without electricity, points out report
https://g1.globo.com/ro/rondonia/noticia/2021/03/09/ro-tem-mais-de-100-mil-pessoas-sem-energia-eletrica-aponta-relatorio.ghtml

TV Record/ Câmera Record
Camera Record shows what life is like without electricity in regions of Brazil
https://recordtv.r7.com/camera-record/camera-record-mostra-como-e-a-vida-sem-energia-eletrica-em-regioes-do-brasil-23092021

Folha de S.Paulo
Solar plant brings clean energy to isolated community in the Amazon
https://www1.folha.uol.com.br/mercado/2021/10/usina-solar-leva-energia-limpa-a-comunidade-isolada-na-amazonia.shtml

Valor Econômico
Interdependence between energy and water gets bigger
https://valor.globo.com/publicacoes/suplementos/noticia/2021/06/07/interdependencia-entre-energia-e-agua-fica-maior.ghtml

Canal Energia
MP 1031 goes against the path of reducing emissions, points out IEMA
https://www.canalenergia.com.br/noticias/53176315/mp-1031-vai-na-contramao-da-reducao-das-emissoes-aponta-iema

Valor Econômico
Thermal will lead to an increase in greenhouse gas emissions
https://valor.globo.com/brasil/noticia/2021/06/14/termicas-levarao-a-aumento-de-emissoes-de-gases-estufa.ghtml

Nexo
Three negative consequences of the sale of Eletrobras
https://www.nexojornal.com.br/colunistas/tribuna/2021/Tr%C3%AAs-consequ%C3%AAncias-negativas-da-venda-da-Eletrobras

Valor Econômico
China, coal and the rest of humanity
https://valor.globo.com/brasil/coluna/a-china-o-carvao-e-o-resto-da-humanidade.ghtml

Thomson Reuters Foundation News
How will Brazil's energy privatization law affect climate change?
https://news.trust.org/item/20210713123145-ityk1/

Outras Palavras
Another nonsense in the privatization of Eletrobrás
https://outraspalavras.net/outrasmidias/mais-um-contrassenso-privatizacao-da-eletrobras/

Clean and inclusive electricity matrix

More coal?

Brazil is moving in the opposite direction to sustainable development. In addition to the government favoring the thermal matrix to the detriment of renewable sources such as wind and solar, it perpetuates the presence of coal in the electricity matrix in an uneconomical way. Read the "Manifesto: Sustainable coal, the new chloroquine for the electricity sector" that IEMA signed with partner organizations.

Impacts

The series of studies carried out by IEMA on the population without access to electricity in the Amazon is being used to help support the bill 4248/2020, which sets out a goal for universal access to electricity in the Legal Amazon Region, defining criteria for the implementation of policies for the universalization of electricity to remote regions during the coronavirus pandemic and amends Law Nº. 10,438, of April 26, 2002.

Regarding the privatization of Eletrobras, the questions about the insertion of natural gas thermoelectric plants, contained in the technical note "Questions to the insertion of natural gas thermoelectric plants in the Provisional Measure 1.031/2021", were used to help support the Direct Action of Unconstitutionality (ADI) 6932, filed by the Brazilian Socialist Party (PSB), Socialism and Liberty Party (PSOL), Sustainability Network, Labor Party (PT), Democratic Labor Party (PDT) and Communist Party of Brazil (PCdoB).

PHOTO: Flickr/ Divulgação Eduardo Tavares

Estadão
The world's largest source of energy, coal still accounts for 38% of the global electricity matrix
https://economia.estadao.com.br/noticias/geral,maior-fonte-de-energia-do-mundo-carvao-ainda-responde-por-38-da-matriz-eletrica-global,70003868253

CNN Brasil
Brazil increased CO_2 emissions by 121% from the use of thermoelectric plants in 2021
https://www.cnnbrasil.com.br/nacional/brasil-aumentou-em-121-emissoes-de-co2-por-uso-de-termeletricas-em-2021/?utm_source=social&utm_medium=twitter&utm_campaign=cnn-brasil

Folha de S.Paulo
Actions against energy crisis already cost R$ 140 billion, says institute
https://www1.folha.uol.com.br/mercado/2021/11/medidas-contra-crise-energetica-ja-custam-r-140-bilhoes-diz-instituto.shtml

Estadão
Senate gives approval for mandatory contracting of coal-fired thermal plants until 2039; text goes to sanctionhttps://economia.estadao.com.br/noticias/geral,senado-da-aval-para-contratacao-obrigatoria-de-termicas-a-carvao-ate-2040-texto-vai-a-sancao,70003928300

O Globo
"Reserve auction for energy contracting goes against the world by focusing on thermoelectric plants", considers IEMA
https://blogs.oglobo.globo.com/miriam-leitao/post/leilao-de-reserva-para-contratacao-de-energia-vai-na-contramao-do-mundo-ao-focar-em-termeletricas-considera-iema.html

Poder 360
7 plants in the auction could bring an extra cost of almost R$ 23 billion
https://www.poder360.com.br/energia/7-usinas-do-leilao-podem-trazer-custo-extra-de-quase-r-23-bilhoes/

Valor Econômico
Hiring of fossil plants moves sector away from climate objectives
https://valor.globo.com/empresas/noticia/2021/12/22/contratacao-de-usinas-fosseis-afasta-setor-dos-objetivos-climaticos.ghtml

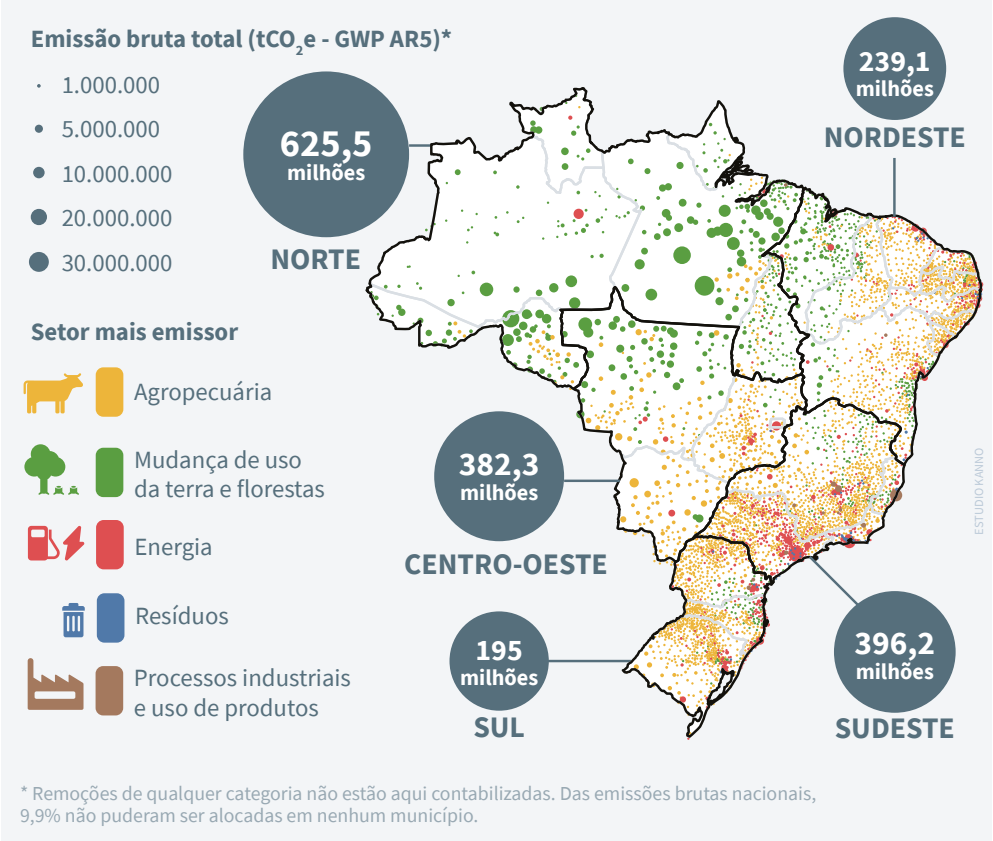
Special projects

PHOTO: Pexels/Sergio Souza

SEEG

The Greenhouse Gas Emissions Estimate System (SEEG), an initiative of the Climate Observatory that counts with the collaboration of the organizations Ipam and Imazon (land use change), Imaflora (agriculture), ICLEI (wastes) and IEMA (energy and industrial processes), released data for 2020. According to its ninth edition, Brazil emitted 2.16 billion tonnes of carbon dioxide equivalent ($GtCO_2e$). It is the highest level in the country since 2006.

And, for the first time, the emissions of each of the 5,570 Brazilian municipalities were calculated separately: the SEEG Municipalities. IEMA was also responsible for collecting data on the energy and industrial process sectors. Emissions are detailed in over a hundred levels of information, covering the period from 2000 to 2018.



The initiative aimed to increase the knowledge of mayors, city councils and local society across the country about the dynamics of emissions, in addition to providing a useful tool to support municipal development policies with carbon reduction.

The ten cities that are champions of greenhouse gases (GHG) in Brazil together emit 172 million gross tonnes of carbon dioxide equivalent (CO_2e). It's more than entire countries like Peru, Belgium or the Philippines. And seven of those big emitters are in the Amazon, where deforestation is the main source of emissions. Among them, with the exception of deforestation, the one that causes the most impact on emissions is the energy sector, which São Paulo leads with 12.4 million gross tonnes of CO_2e.

The most populous municipalities, such as capitals, have the energy sector as their main source of GHG emissions, mainly due to the consumption of fossil fuels in transport. Therefore, among the ten most emitters is also Rio de Janeiro. In industrial processes, Serra, in Espírito Santo, leads the ranking of GHG emissions, with 10.4 million tonnes of CO_2e.

In addition to the launch webinar, five online events were held to discuss the specifics of emissions in each Brazilian region. The outreach strategy of SEEG Municipalities included the dissemination of press releases and infographics with the main information by sector and by region of the country.

SEEG SOLUTIONS

After presenting the diagnosis of Brazilian emissions, the SEEG team held private online meetings with representatives of the public sector and the third sector in order to create an emissions reduction guide. The result is available in the guide "87 solutions to reduce greenhouse gas emissions in Brazilian cities". http://energiaeambiente.org.br/produto/87-solucoes-para-reducao-das-emissoes-de-gases-de-efeito-estufa-nos-municipios-brasileiros

PHOTO: Daniel Granja

How to reduce emissions

In addition to identifying the GHG emissions of each municipality in Brazil, SEEG also mapped and compiled 87 mitigation and adaptation actions at the local level, in order to promote sustainable development with reduced emissions. The recommendations are gathered in the SEEG Soluções catalog and can be accessed on the initiative's online platform. Each action carries a set of more than 20 complementary information that seek to support its implementation in the municipalities. When consulting a solution, it is possible to verify items such as the impact on emissions and the Sustainable Development Goals (SDGs) involved.

Personal emission

The SEEG team developed and made available on the portal G1, the Carbon Calculator, a new tool that allows estimating how much greenhouse gases each Brazilian's actions generate. The calculator was made in order to consider the impact of each person, according to the way of life and place in which they live. https://especiais.g1.globo.com/meio-ambiente/calculadora-emissoes-carbono/

Implications for climate goals

IEMA collaborated in the preparation of the report Analysis of Brazilian Greenhouse Gas Emissions and Their Implications for Brazil's Climate Goals (1970–2020), published last October based on information from SEEG. The document shows that in 2020, the year in which the Covid-19 pandemic stopped the world economy and caused an unprecedented reduction of almost 7% in global emissions, Brazil went against the rest of the world. Total gross emissions reached 2.16 billion tonnes of CO_2e in 2020, up from 1.97 billion tonnes in 2019.

Impact

The recurring effort to publish Brazilian emissions, among so many mentions and uses of this type of data, resulted in the SEEG as a source of information on greenhouse gases by the Ten Year Energy Expansion Plan 2031 (PDE 2031). The planning was prepared by the Energy Research Company (EPE) under the guidelines and support of teams from the Ministry of Mines and Energy, coordinated by the Secretariats of Planning and Energy Development (SPE/MME) and of Petroleum, Natural Gas and Biofuels (SPG /MMS).

IN THE MEDIA

TV Câmara Campinas/ Giro Ambiental
Greenhouse gas emissions increase by 10% in 2019
https://youtu.be/Wb2ULHdDBiE?t=158

Globo News
Cities that emit the most carbon dioxide are in the Amazon, according to a survey
https://g1.globo.com/globonews/estudio-i/video/cidades-que-mais-emitem-gas-carbonico-ficam-na-amazonia-aponta-levantamento-9320419.ghtml

TV Globo/ Bom dia Paraná
Curitiba is ranked seventh among the most polluting cities in Brazil
https://globoplay.globo.com/v/9332531/

O Globo
Research NGO creates catalog to help municipalities reduce carbon emissions
https://oglobo.globo.com/brasil/meio-ambiente/ong-de-pesquisa-cria-catalogo-para-ajudar-municipios-reduzirem-emissao-de-carbono-25163907

TV Alesp
Felipe Barcellos, reveals actions to reduce greenhouse gases in municipalities
https://www.youtube.com/watch?v=gwq6gmCKCLQ

Revista Galileu
No shortcuts: discover the ways for Brazil to fight the climate crisis
https://revistagalileu.globo.com/Ciencia/Meio-Ambiente/noticia/2021/12/sem-atalhos-conheca-os-caminhos-para-o-brasil-combater-crise-climatica.html

MAPBIOMAS

The Annual Mapping of Land Use and Coverage in Brazil (MapBiomas) project is a multi-institutional project involving universities, civil society organizations – including IEMA – and technology companies. Through the project, the processing of satellite images and the generation of annual maps of coverage and land use in Brazil, are made available in an open and free way. The tool helps to understand the historical evolution of the Brazilian territory and to assess the consequent impact of human activities. In 2021, MapBiomas Collection 6 was published, with new information on land use and land cover from 1985 to 2020.

In addition, unpublished data on the evolution of industrial mining and prospecting areas from 1985 to 2020 were included. In general, the research shows that the area planted with soybeans and sugarcane reached the same extent as the entire countryside in Brazil in the last 36 years. And, in that period, the mined area in Brazil grew six times. While the production of iron (25.4%) and aluminum (25.3%) account for half of the industrial mining area, 86.1% of the area mined is related to the extraction of gold.

PHOTO: Divulgação

Brazil Climate Action Hub, COP 26

COP 26

IEMA was at the 26th Conference of the Parties (COP26), held in November in Glasgow, Scotland. The annual meeting is promoted by the United Nations Framework Convention on Climate Change (UNFCCC), in which countries debate and seek to sign agreements to face climate change.

This time, in addition to following the discussions, the institute actively participated in the debates in the Blue Zone of the conference, restricted to those who have credentials, mainly in the Brazil Climate Action Hub – formed by civil society organizations –, and outside the conference, in the Summit of Peoples for Climate Justice. Representatives of IEMA followed discussions and resolutions regarding the decarbonization of the energy sector, with a focus on transports and electricity matrix.

Both areas are directly linked to the conditions of social development related to access to energy, right to the city, cost of living and quantity and quality of jobs. Issues, therefore, directly related to climate justice.

Regarding electricity generation, the final text of the Glasgow Climate Pact changed the initial proposal of “discontinuing the use of coal by 2030”, which did not have a consensus, for “reducing the use of coal”. The fuel has been in use for approximately

200 years, since the Industrial Revolution, and this was the first time that the main cause of human-induced climate change was present in the final text. India and China pushed for the document to be weakened.

Ricardo Baitelo, energy planning specialist and project coordinator at IEMA, presented 2020 data on the expansion of the thermoelectric matrix in Brazil. According to the information, the Brazilian electricity matrix has about 2% of coal in the composition of its installed capacity. In power generation, this percentage is lower. The matrix has changed in recent decades, with a reduction in dependence on hydroelectric plants and a greater prominence of wind and solar energy, already surpassing coal.

The effort for a fair energy transition with the elimination of this source in Brazil would, therefore, be much smaller than in the countries that are highly dependent on it. However, the federal government is going against the grain of this discussion, with a plan to expand coal production by 2050. It is worth remembering that Brazil has an enormous, yet unexplored, potential of renewable sources, especially solar and wind power. Thanks to the geographical position of the country, the levels of solar radiation in places less favorable to the use of photovoltaic systems are still better than in European countries with currently the highest installed solar energy capacities. Therefore, the transition challenge in the electricity sector is not exclusively technical. It is also political.

On the thematic Transport Day of COP 26, an alliance formed by a hundred signatories, including countries and companies, established the work so that only new zero-emission trucks and cars are produced from 2035 onwards. This is a clear sign of progress, but insufficient to address the climate urgency and the perverse patterns of urban mobility, especially in developing countries

The electrification of transport is necessary for achieving climate goals, however, focusing exclusively on it, shows the lack of a drive for truly sustainable mobility. This should consider all the pillars: social, environmental and economic. Thus, it is reckless to leave urban (re)planning and active and collective modes of transport in the background.

SEE THE AVAILABLE DEBATES IN WHICH IEMA PARTICIPATED:

Hydropower: the energy solution doomed by the climate crisis?
https://energiaeambiente.org.br/a-dependencia-de-hidreletricas-pode-ser-um-risco-para-o-brasil-mostra-painel-na-cop26-20211108

- Coal and the challenges of the Just Transition in Southern Brazil
https://energiaeambiente.org.br/sul-tem-condicoes-para-substituir-100-do-carvao-por-energia-eolica-e-solar-aponta-iema-em-glasgow-20211109

- Brazilian tools for planning and monitoring NDCs
https://energiaeambiente.org.br/cop26-seeg-e-mapbiomas-apontam-os-culpados-das-emissoes-no-brasil-e-solucoes-20211109

- The Brazilian Northeast and the potential of the Just Energy Transition in Brazil
https://energiaeambiente.org.br/nordeste-desponta-como-produtor-de-energias-renovaveis-e-tem-potencial-de-incremento-mostra-painel-com-liderancas-femininas-na-cop26-20211109

IN THE MEDIA

Colabora
COP26: 77 countries sign agreement to zero coal-based energy
https://projetocolabora.com.br/ods13/cop26-77-paises-assinam-acordo-para-zerar-energia-a-base-de-carvao/

Nexo Jornal
How Brazil can meet its climate goals on 3 fronts
https://www.nexojornal.com.br/expresso/2021/11/08/Como-o-Brasil-pode-cumprir-suas-metas-clim%C3%A1ticas-em-3-frentes

Diário do Grande ABC
COP-26: Panel criticizes coal program in southern Brazil
https://www.dgabc.com.br/Noticia/3806362/cop-26-painel-critica-programa-de-carvao-no-sul-do-brasil

Uol
COP-26: Panel criticizes coal program in southern Brazil
https://noticias.uol.com.br/ultimas-noticias/agencia-estado/2021/11/09/cop-26-painel-critica-programa-de-carvao-no-sul-do-brasil.htm

Poder 360
Tax cut on diesel harms climate target, says study
https://www.poder360.com.br/economia/corte-de-impostos-sobre-o-diesel-prejudica-meta-climatica-diz-estudo/

15 years of IEMA

IEMA celebrated its 15th anniversary in 2021. To celebrate, follow the institute's trajectory until this year.

PHOTO: Unsplash / Guilherme Stecanella

2006

Foundation

IEMA was created with the support of the Hewlett Foundation, which saw a gap in the technical performance of civil society organizations. The first focus of our work was to improve air quality.

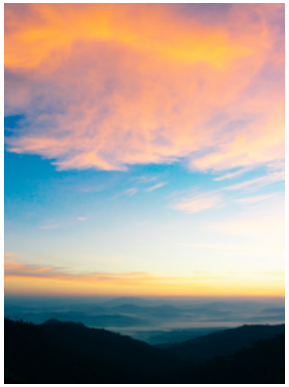


PHOTO: Unsplash / Guilherme Bustamante

2008

Proconve P7

The institute provided technical support to the Federal Public Ministry of São Paulo in a lawsuit filed for failure to comply with Phase P6 of the Air Pollution Control Program by Motor Vehicles (Proconve) for heavy vehicles. Simulations and estimates of emissions and respective reductions resulting from the different measures discussed and negotiated were carried out.

2009

Monitoring in São Paulo

Development of the air quality monitoring data management system (QUALAR) and its donation to CETESB, being the first initiative to support a state environmental agency.

Bicycle in the cities

The study "The bicycle and the cities" was published, with information encouraging municipal administrations to incorporate the use of bicycles as a means of transport in urban mobility systems.

2011

Road emissions

Technical leadership of the Working Group established by the Ministry of the Environment to estimate vehicular emissions in Brazil: "1st National Inventory of Atmospheric Emissions by Road Motor Vehicles". Among the developments, it boosted the elaboration of state inventories and provided subsidies for the discussion of vehicle inspection programs.

PHOTO: Unsplash / Ramy Robson

2012

Transport and urban mobility

Within the scope of the Transport and Urban Mobility Sector Plan for Climate Change Mitigation (PSTM), IEMA provided technical support to the Ministries of the Environment, Cities and Transport for the estimation of emissions from each sector and reductions arising from actions mitigation measures listed for regional freight transport and urban passenger transport.

Rail emissions

In partnership with the National Land Transport Agency (ANTT), IEMA produced the 1st National Inventory of Atmospheric Emissions from Rail Freight Transport. The document presented data disaggregated by concessionaire and type of goods transported.

15 years of IEMA

PHOTO: Pexels / Kaique Rocha

PHOTO: Pexels / Pixabay

PHOTO: Rovena Rosa/Agência Brasil

2013

Brazilian emissions

IEMA, together with the coordination of the Climate Observatory and partner institutions, prepared the first edition of the Greenhouse Gas Emissions Estimation System (SEEG), taking responsibility for GHG emissions from the energy and industrial processes sectors in the country.

2014

Civil Aviation

Together with the National Civil Aviation Agency (Anac), IEMA launched the National Inventory of Atmospheric Emissions from Civil Aviation.

Monitoring networks

The first diagnosis of air quality monitoring networks in Brazil mapped the points managed by the public authorities and their financing strategies. The initiative was supported by the Ministry of the Environment and used as a subsidy for the start of discussions at Conama on updating national air quality standards.

2015

Air quality data

Launched the Air Quality Platform, the first national initiative to systematize and make available state air quality monitoring data. It allowed the visualization of historical air quality series in the country.

Electricity matrix

In conjunction with Greenpeace, IEMA developed the SEEG Electric Monitor. The tool contained daily updates on the composition of the Brazilian electricity matrix and its greenhouse gas emissions.

2016

Data for WHO

The Air Quality Platform was adopted as a source for the World Health Organization's database on air pollution in 103 countries.

Bus lanes

The Exclusive Lane Study (online report and panel) evaluated the impact in terms of travel time and air pollution, over two years, of 64 dedicated lanes for buses in the city of São Paulo.

Coal financing

BNDES closed lines of financing for coal- and oil-fired thermoelectric plants after years of pressure from civil society, including dialogues between IEMA and the bank about the impacts of these plants.

2017

Cars in São Paulo

IEMA prepared the Inventory of Atmospheric Emissions from Road Transport of Passengers in the Municipality of São Paulo.

Energy policy

IEMA acted in the mobilization of the Infrastructure Working Group and the Front for a New Energy Policy and sent contributions to the public consultation of the Ten Year Energy Expansion Plan (PDE) 2026.

Civil society in Recife

IEMA held a cycle of workshops with civil society organizations that make up the Mobility Articulation Network (RAMO), taking technical inputs to civil society.

15 years of IEMA

PHOTO: Unsplash / Loris Lambert

PHOTO: Unsplash / Nareeta Martin

2018

Energy forests
Study evaluated alternatives of guaranteed sources of electricity generation that compensate for the variability of wind or solar plants. It is possible to produce enough electricity from eucalyptus biomass to reduce emissions from the National Interconnected System (SIN) by one fifth.

Electricity in the Amazon
Publication shows results of mapping public policies for the supply of electricity to isolated communities in the Amazon. A work oriented towards the articulation of a proposal for inclusive and sustainable universalization.

Public transport in Recife
The Guide of Incidence on Economic and Financial Aspects of Public Transport in the Metropolitan Region of Recife was created to support people, movements and organizations engaged with the public transport agenda, urban mobility and the right to the city.

Article on Nature
The IEMA team was part of the group of authors who published a scientific article on Scientific Data, a journal that is part of the Nature group, on the methodology of the Greenhouse Gas Emissions Estimation System (SEEG).

2019

Bus fleet renewal
IEMA developed, prepared and provided training on PlanFrota, with the objective of supporting SPTrans, bus operators and the Municipality of São Paulo in the execution of Municipal Law 16,802, on the reduction of emissions from public transport by bus. It is a tool that calculates emissions according to different scenarios for the composition of the fleet.

Transport infrastructure
Methodology to build projections of greenhouse gas emissions and local pollutants in different future transport logistics infrastructure scenarios. Provided technical support to the Planning and Logistics Company (EPL) for the incorporation of the environmental dimension in the planning of transport logistics infrastructure.

Transport in the Amazon
The project "Sustainable Transport Infrastructure in the Amazon", which analyzed the impact of freights across the region, had as its main objective to generate more knowledge for civil society organizations and contribute to the qualification of the debate on policy, planning and regulation of freight transport.

Energy and Communities Network
IEMA became part of the Energy and Communities Network (Rede E&C), formed by organizations in search of the right to clean and sustainable energy. The Network organized the International Symposium "Energy Solutions for Communities in the Amazon", bringing together 830 participants and resulting in recommendations to overcome the energy exclusion of communities in remote areas of the Amazon.

Without electricity in the Amazon
The institute developed a model to estimate the population without access to electricity in the Amazon region, broken down by groups: indigenous peoples, residents of extractive reserves, human settlement groups and quilombolas. The results supported the E&C Network in the elaboration of proposals for regulatory improvement. The study was also presented at a public hearing in the Chamber of Deputies and used by the government to bring electricity to communities without access.

15 years of IEMA

PHOTO: Flickr / DaviPinheiro

PHOTO: Tomaz Silva/Agência Brasil

PHOTO: Unsplash/ Rodrigo Kugnharski

2019

Use of water by thermoelectric plants
The organization developed a set of water use indicators to be applied in Brazil considering the thermodynamic cycle, conversion efficiency and the plant's cooling technology. They were used by the National Water Agency (ANA) in its Manual of Consumptive Uses of Water in Brazil.

MapBiomas infrastructure
It collaborates with the inclusion of geographic information on transport and energy infrastructure in the country and uses the data available in the Annual Mapping Project of Coverage and Land Use in Brazil (MapBiomas), which is in its 5th collection, to act on energy issues and transport.

2020

Postponement of Proconve
A prospective assessment showed the impact of the postponement of P8 on Proconve emissions from road transport in the country, proposed by Anfavea to IBAMA. The result supported the public debate and the phase continued without delay.

Transport by bus from São Paulo
The Monitor de Ônibus SP, an online platform to monitor daily updated indicators on the operation of municipal buses in São Paulo was published. Through it, it was possible to observe changes in public transport caused by the Covid-19 pandemic.

Non-polluting buses in capitals
IEMA analyzed the fundamental aspects of the introduction of clean buses in 13 Brazilian cities with a view to mitigating GHG emissions, reducing air pollution and improving public transport by bus.

Transport Logistics in the Amazon
Studies were carried out: tracking of freight transport infrastructure projects planned in the Legal Amazon and their political-economic drivers; mapping of the trend scenario for the development of freight transport in the Amazon and possible resulting social and environmental risks; mapping of weaknesses and opportunities for improving the institutional, legal and regulatory framework of national decision-making processes on freight transport. They were then discussed with civil society organizations with a view to training everyone.

More Light for the Amazon
Among the work carried out by Rede Energia e Comunidades during the year, the preparation of proposals for improving the Operationalization Manual of the Mais Luz Para a Amazônia Program (2020-2022) stands out.

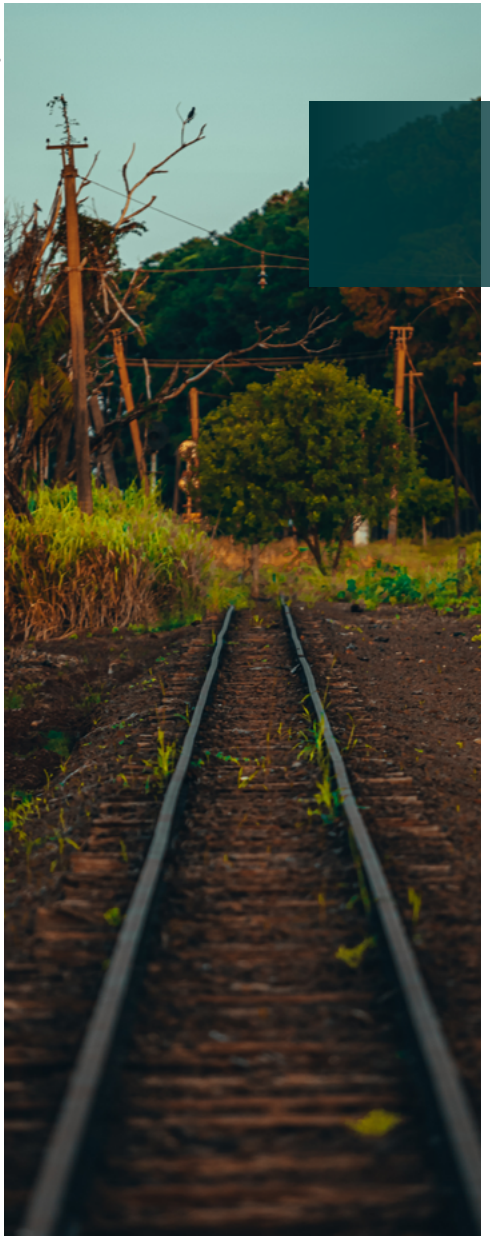


PHOTO: Pexels / Sergio Souza

Institutional development

Strengthen governance, management and communication, in addition to promoting the personal development of the IEMA team

IEMA seeks a position in the spectrum of Brazilian organizations with the potential to fulfill the role of a think tank that operates at the interface between energy and the environment. Thanks to the proposed action, the organization has an accurate technical production and establishes dialogue with sectors of the public administration, private entities and organizations of the third sector. In order to materialize its full potential, activities were carried out throughout the year to improve the institution and strengthen IEMA's management through strategic actions to strengthen governance, management and communication, as well as to train the team. In addition, two interns were hired, Helen Sousa and Raissa Gomes, and project manager Ricardo Baitelo.

COMMUNICATION

In 2021, IEMA's Communication area completed three years, with the mission of enhancing the impact of studies and actions carried out by the organization. Through disclosure to the press and other social actors, we seek to disseminate possible ways for the country to be able to ensure the sustainable use of natural resources with social and environmental protection – in line with the Institutional Strategic Planning in force until 2024. Therefore, each IEMA project had specific communication planning, according to its characteristics and demands.

Throughout the year, relations were strengthened with the press in general, especially large communication vehicles, by investing more in the production of press releases referring to SEEG Municipalities and COP 26. This was possible thanks to the communication effort of IEMA and the technical team in the task of producing more analysis on the topics covered by the organization, resulting in triple citations in the press compared to the first year in the Communication area.

HIGHLIGHTS:

In 2021, IEMA recorded 606 media insertions, including interviews, replicated releases and citations in reports;

●

–In September, the first IEMA webinar was held to launch the Air Quality Platform. More than 290 people followed the event on the organization's YouTube channel;●

Among the actions, was made a presentation on climate justice at the Virtual Public Audience of the São Paulo City Council for the Implementation of the Climate Agenda in the city and made the opening lecture of the 18th edition of the National Congress on the Environment of Poços de Caldas with the theme Climate Justice in the Anthropocene;

●

IEMA's Communication area actively participated in projects in collaboration with other institutions, including Climate Observatory, Infrastructure WG, Gender and Climate WG, Coalizão Respirar and Energy & Communities Network.

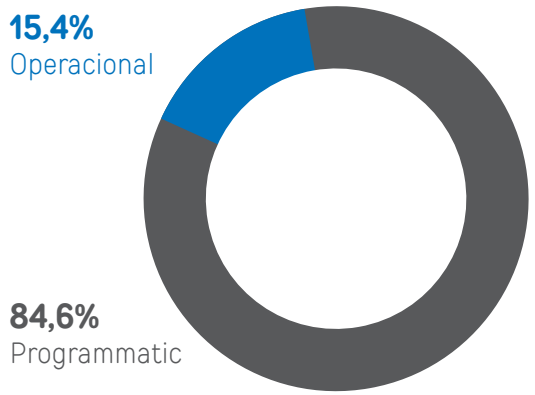
Supporters and financial indicators

SUPPORTERS (2021)

Charles Stewart Mott Foundation
Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ)
Energy Transition Fund (ETF)
Fundação Rosa Luxemburgo (FRL)
Instituto Clima e Sociedade (ICS)
Observatório do Clima (LabOC)

USE OF RESOURCES

	2021
Team	2.448.885
Third Parties	766.075
Travel / Conferences	45.906
Occupation / Infrastructure	171.447
General / Taxes	42.551
	3.474.863



Supporters and financial indicators

BALANCE SHEET

December 31, 2020 and 2019 (In BRL)

ASSETS	2021	2020
CURRENT		
Cash and cash equivalents	3.855.854	4.363.590
Prepaid expenses	174.316	44.385
Other accounts receivable	124.444	131.893
	4.154.614	4.539.868
Fixed assets	98.975	118.068
	98.975	118.068
TOTAL ASSETS	**4.253.589**	**4.657.936**

LIABILITIES AND NET ASSETS	2020	2020
CURRENT		
Suppliers	18.604	49.693
Tax obligations	117.979	90.832
Employment and social security obligations	254.009	223.664
Advance donations	1.341.641	1.947.918
	1.732.233	2.312.108
NET ASSETS		
Social Assets	2.300.205	2.339.716
Investment donations	45.625	45.625
Surpluses for the year	175.527	(39.511)
	2.521.356	2.345.829
TOTAL LIABILITIES AND NET ASSETS	**4.253.589**	**4.657.937**

Supporters and financial indicators

STATEMENT OF INCOME

Years ended December 31, 2020 and 2019 (In BRL)

	2020	2020
OPERATING REVENUE		
With restriction		
Donation revenue	3.540.641	3.155.733
Unrestricted		
Voluntary donations	–	–
Other revenues	750	11.044
Volunteer activities	6.591	15.909
	3.547.982	**3.182.686**
PROJECT COSTS		
Contractors	(766.075)	(810.920)
Personnel expenses	(2.448.885)	(2.139.358)
General	(239.591)	(248.129)
Tax	(20.313)	(21.233)
	(3.474.863)	**(3.219.640)**
GROSS OPERATING SURPLUS	**73.119**	**(36.955)**

Supporters and financial indicators

OPERATIONAL EXPENSES		
Volunteer activities	(6.591)	(15.909)
General and administrative expenses	(28.264)	(23.864)
Depreciation	(19.093)	(17.549)
	(53.948)	**(57.322)**
RESULT BEFORE FINANCIAL INCOME AND EXPENSES	**19.170**	**(94.276)**
Financial expenses	(37.305)	(25.646)
Financial revenue	193.661	80.411
	156.356	54.765
SURPLUS FOR THE PERIOD	**175.527**	**(39.511)**

The year 2021 was audited by Audisa Auditoria e Consultoria and is available on the website (http://energiaeambiente.org.br/transparencia).

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