

# ANNUAL REPORT

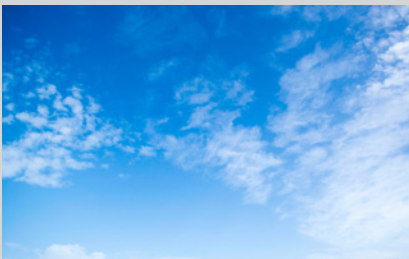


**iema**  
Instituto de Energia  
e Meio Ambiente

2020

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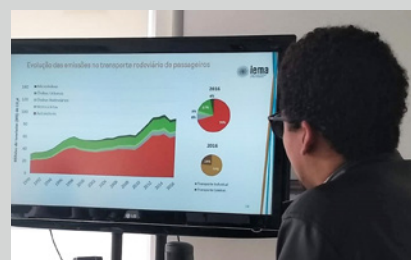


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# 2020 ANNUAL REPORT

**T**he Instituto de Energia e Meio Ambiente (IEMA) is a Brazilian non-profit organization founded in 2006 and located in São Paulo, Brazil. Recognized for its role in producing and disseminating technical-scientific knowledge about the environment, it supports the formulation and assessment of public policies in energy and transportation, with a view to improved social and environmental conditions.

*The work of IEMA is carried out following **5 Strategic Objectives committed through transversal projects distributed across 9 Lines of Action.***

The work of IEMA is carried out following 5 Strategic Objectives committed through transversal projects distributed across 9 Lines of Action. The fifth objective — Institutional Development — was elaborated to strengthen governance, management, communication, and team promotion and development.

The Institute conducted studies, analyses, publications, meetings with partners, supporters, funders, and conversations with the press to meet the five objectives. It also collaborates and coordinates with government entities.

This Annual Report presents, by way of transparency, the main activities carried out in 2020, taking into account the Covid-19 pandemic, which affected the planning and execution of actions for the period covered herein. In addition to a short description of IEMA's performance and its impacts, the balance sheet and how the resources were applied are also explained.

**ENJOY THE READING!**

# INSTITUTO DE ENERGIA E MEIO AMBIENTE

## Purpose

Qualify decision-making processes so that transportation and energy systems in Brazil ensure the sustainable use of natural resources with social and economic development.

## Values

**Generosity:** cooperation and knowledge sharing with society.

**Excellence:** appreciation for scientific rigor and independent thinking.

**Transparency:** genuine openness and listening.

**Impact:** focus on long-lasting, public interest-oriented transformations.

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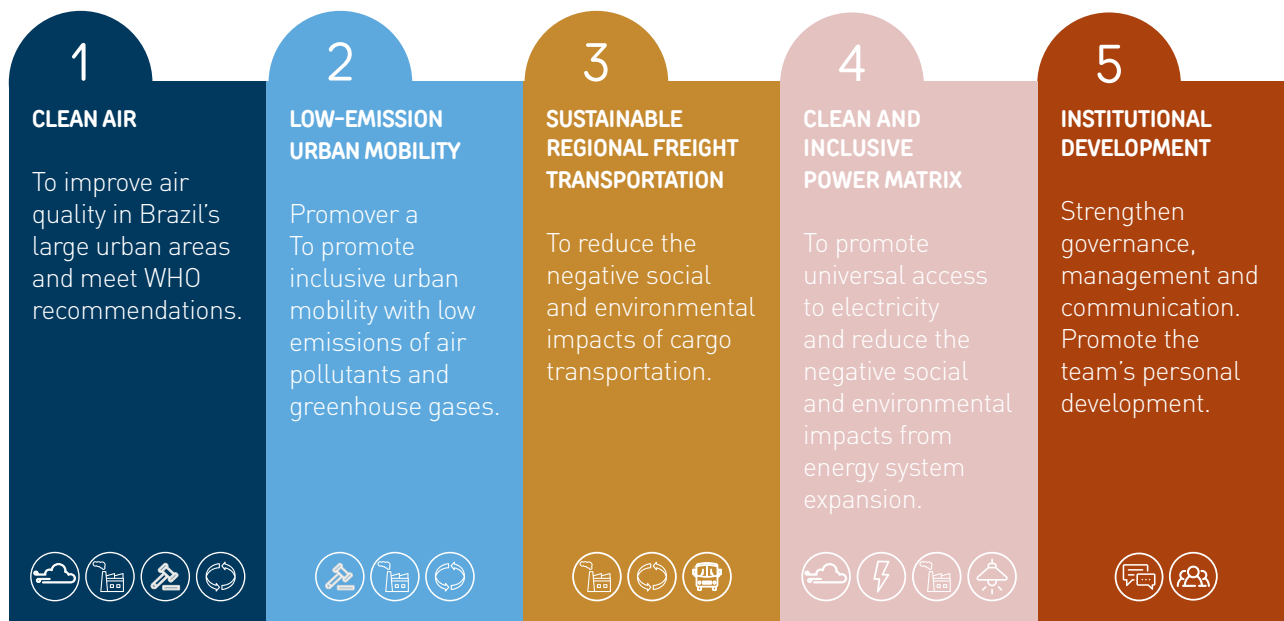
Melissa Harkin, CT

# STRATEGIC OBJECTIVES AND LINES OF ACTION



PHOTO: Sergio Souza/ Pixels

## OBJECTIVES



## LINHAS DE AÇÃO

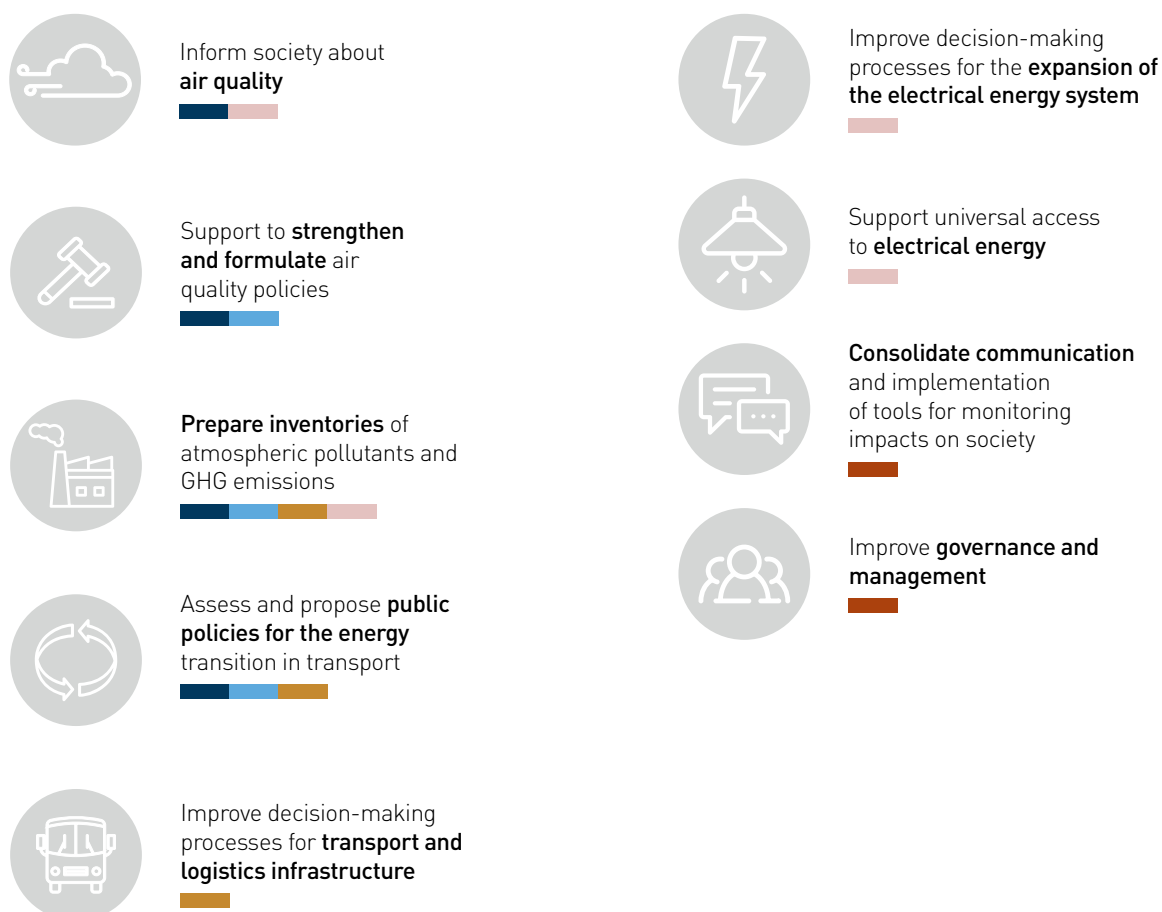






PHOTO: David Tsai/ IEMA

## CLEAN AIR

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

Air pollution represents a threat to human health, and it is associated with the worsening of respiratory and cardiovascular diseases. The WHO, a specialized agency of the United Nations (UN) responsible for international public health, has defined general guidelines for the creation of national public policies on air quality and recommended, based on the best scientific knowledge available, maximum acceptable concentrations of certain pollutants in the air to protect individuals from grave risks to their health.

In Brazil, the WHO recommendations and the national air quality standards are systematically violated. It is no coincidence that deaths due to air pollution increased by 14% between 2006 and 2016, accounting for a significant part of deaths from [Chronic Non-Communicable Diseases \(NCDs\)](#).

To contribute to dealing with this public health problem in large Brazilian urban agglomerations, IEMA produces and organizes technical knowledge, increasing society's awareness on the subject and helping to improve air quality management in the country.

### Information to Society about Air Quality

Monitoring the levels of pollutants in the air is an important management tool. It allows both to identify possible risks to human health and support the formulation and evaluation of public policies related to the issue, which is critical and problematic. Thus, Brazil must have a good air quality monitoring network. The information generated must be made widely available, allowing society to become aware of the risks it is subject to and coordinate its interests in formulating and implementing public policies.

### National Air Quality Policy

Given that air pollution is a problem with multiple causes, tackling it requires a multisectoral vision that can (i) strengthen the technical and budgetary capacity of environmental agencies to incorporate their environmental management instruments—air quality monitoring, emissions inventory, source control, etc.; and (ii) provide close coordination with health, transportation, energy, and industry policies, to name a few, and promote the coordination between federal government institutions and between them and state and municipal governments.



# INCLUSIVE AND LOW EMISSIONS URBAN MOBILITY

*Promote urban mobility that is inclusive and has low emissions of atmospheric pollutants and greenhouse gases*

Passenger transportation in Brazil is overly dependent on the supply of fossil fuels. In 2019, the transportation of people, mainly in the urban environment, accounted for 20% of fossil energy consumed in the country.

This fossil preponderance in the power matrix arising from the “transportation” component, combined with a pattern of urban mobility centered on the growing use of individual motorized transport, explains the significant increase in greenhouse gas emissions resulting from the transportation of people in recent decades, reaching 95 MtCO<sub>2</sub>e in

2019 and 23% of Brazilian emissions associated with the use and production of energy.

In addition to being energy inefficient and intensive in greenhouse gas emissions, the standard of urban mobility centered on individual motorized transport extends several of the current problems that characterize medium and large cities in the country:

- The spread of cities and the consequent increase in distances, travel times, and costs;
- A high number of traffic accidents and victims;
- Increased traffic, which imposes a critical economic cost on society;
- Degradation of living spaces;
- Difficulty in accessibility, especially for the lower-income population;
- Growing demand for more road space;
- Deterioration of air quality.

PHOTO: Rafael De Nadal/ Unsplash



To contribute to the reversal of such scenario, IEMA has systematized and produced technical knowledge to support measures that enable the reduction of energy consumption in tandem with the adoption of non-polluting energy sources, which, at the same time, increase, fairly and safely, the accessibility of the population to the opportunities that cities offer.



PHOTO: Ricardo Botelho/Mifra/ Public Photos

# REGIONAL SUSTAINABLE FREIGHT

## *Reduce negative social and environmental impacts of freight*

One of the central topics for the decarbonization of the Brazilian economy is the activity of freight, which, in 2019, was responsible for 25% of greenhouse gas emissions associated with the country's power matrix.

The predominance of road transport and the heavy dependence on diesel for trucks justify the attention that must be given to this issue when it comes to implementing measures to mitigate emissions.

In addition to greenhouse gas emissions, there are other relevant socio-environmental issues associated with freight transport in Brazil that have not been 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, IEEMA has produced and systematized technical knowledge and contributed to the strengthening of spaces for qualified dialogue to (i) expand the modal mix through the transfer to high-capacity and more

efficient modes—rail and waterway; (ii) replace petroleum-derived fuels by other energy sources with lower intensity of atmospheric emissions; and (iii) incorporate social and environmental risks into policy, planning, and regulation of freight transport and associated infrastructure.



PHOTO: João Lucas Oliveira/ Unsplash

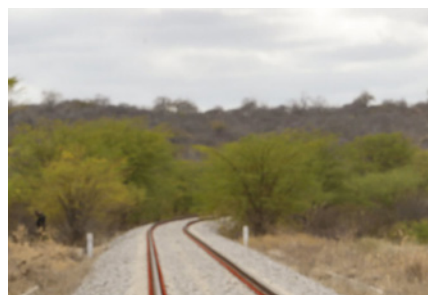


PHOTO: Marcos Corrêa/PR/ Public Photos

# CLEAN AND INCLUSIVE POWER MATRIX

*Universalize access to electrical energy*

PHOTO: Felipe Barcellos/ IEMA



Despite not explicitly mentioning access to electrical energy as a fundamental right, the Federal Constitution provides that the rights expressed therein do not exclude others arising from its principles. Since among those principles is the “dignity of the human person,” one can correctly characterize access to electrical energy as one of their fundamental rights. In any case, Constitutional Amendment Bill 44/2017 is in progress, which aims to list access to electrical energy as a fundamental social right.

The public electrical energy service still does not serve the entire Brazilian population. According to an estimate made by IEMA, in the Amazon region alone, around one million people still live in a situation of *electrical energy exclusion*. The resources made available by government programs to universalize electrical energy have been relatively scarce. They have been used only to meet residential demand, not considering the possible demands for local productive activities. Expanding access to electrical energy is essential

to promote socioeconomic development, strengthen communities, and increase the resilience of a strategic region for the country.

In addition to being slow, the expansion of access to electrical energy has been fundamentally based on fossil fuels. In many cases, communities have organized themselves through precarious and polluting systems, such as diesel and gasoline power generators. Thus, strictly speaking, one cannot say that the existing public policy in Brazil is sufficiently comprehensive to guarantee that communities have access to the electrical energy generated from renewable sources. The installation of *off-grid* renewable systems in remote areas of the Amazon, on the necessary scale, is still a challenge to be faced.

Seeking to contribute to the universalization of access to electrical energy, IEMA develops a set of activities to support the formulation and implementation of a public policy that incorporates consistent instruments for planning, financing, and monitoring.



PHOTO: Munir Younes Soares/ IEMA



# CLEAN AND INCLUSIVE POWER MATRIX

*Reduce negative social and environmental impacts of the expansion of the electrical energy system*

Historically, electricity generation in Brazil has occurred mainly through hydroelectric power plants. However, as most of the country's remaining water potential is located in the Amazon—a sensitive region from a social and environmental point of view—the Brazilian power matrix is already experiencing a transition period marked by the reduction of hydroelectricity share in the country's matrix.

Apparently, public authorities and business sectors have pointed to thermal power plants as the preferred technological option. Recent auctions have contracted large amounts of power from natural gas plants. In addition, there is a set of initiatives focused on a “new gas market,” which ends up pushing for the growth of thermal generation on equal footing to the exploration of the pre-salt reserves and even the import of liquefied natural gas (LNG).

Additionally to the growth in greenhouse gas emissions, the expansion of thermoelectricity increases the risks to public health due to air pollution. It can also aggravate conflicts over water use, depending on the hydrographic basin where new plants are installed. Adding to the chronic operational, budgetary, and institutional troubles of environmental agencies, such risks can make it challenging to carry



PHOTO: Icaro Cooke/Flickr

out social and environmental assessments on time and with the necessary transparency and depth.

In this scenario, financial, environmental, and electrical energy sector agencies need to seek integrated solutions to anticipate the consideration of social and environmental risks at the initial phases of planning the expansion of the electrical energy system and, thus, avoiding the proposal of projects in territories where such risks are high. It is noteworthy that, although the financial sector does not have a regulatory role, its inducing power, through its socio-environmental policies, greater transparency in the financing process, and specific environmental safeguards, can be more effective than the regulation itself in changing the behavior of the productive sector.

In general terms, the work of IEMA, in this particular topic, has been the production and systematization of technical knowledge to contribute to qualifying the debate in society in two complementary directions: (i) the incorporation of socio-environmental risks in the planning and regulation of the expansion of the electrical energy system, and (ii) the improvement of the socio-environmental governance of financial institutions so that adequate safeguards are used in financing the expansion of the energy sector.

# 2020 MAIN ACHIEVEMENTS



PHOTO: Divulgação / IEMA

PHOTO: Ramy Robson/Unsplash



# AIR QUALITY IN THE COVID-19 PANDEMIC

Since the onset of the Covid-19 pandemic in Brazil in 2020, the country's tackling of social and environmental problems has been impacted. Faced with the challenge of dealing with the public health crisis, which has affected virtually all instances of society, the inefficiency of current socioeconomic models to improve the quality of life has become even more evident, especially in countries with greater economic inequality, as it is the case of Brazil, particularly concerning air pollution.

The leading cause of air pollution in cities is typically transport activity, especially the use of cars. As it was necessary to reduce the number of people circulating to control the pandemic, there was a drop in the emission of pollutants into the atmosphere, mainly in large metropolises. Thus, as unusual as it may seem, the public health crisis has led to a cleaner environmental situation.

## WEBINAR

Representing the RespirAR Coalition, a group of organizations that focuses on having less polluted air, IEMA participated in the webinar "[The Crossroads of Mobility in the Pandemic](#)." The webinar is available on YouTube under the "Nossa BH" channel. Among the issues discussed, the technological updating of buses, which helps to reduce emissions, gained prominence.

## ARTICLES

### EcoDebate

**The Close Relationship between Air Quality and the Coronavirus**

<https://www.ecodebate.com.br/2020/05/15/a-estreita-relacao-da-qualidade-do-ar-com-o-corona-virus/>

## IEMA IN THE PRESS

### COLABORA

**More Sustainable Cities, Fewer Epidemics**

<https://projetocolabora.com.br/ods11/cidades-mais-sustentaveis-menos-epidemias/>

### MÍDIA NINJA

**Coronavirus: Blue Skies, Stars, and Pollution Reduction in São Paulo**

<https://midianinja.org/news/coronavirus-ceu-azul-estrelas-e-queda-da-poluicao-em-sp/>

### FOLHA DE SÃO PAULO

**Specialist Says São Paulo Has Already Improved Air Quality**

<https://www1.folha.uol.com.br/equilibrioesaude/2020/03/sao-paulo-ja-tem-melhora-na-qualidade-do-ar-diz-especialista.shtml>

**Satellite Images Show Pollution Spot in SP Reduced during Lockdown**

<https://www1.folha.uol.com.br/ambiente/2020/04/imagens-de-satelite-mostram-que-mancha-de-poluicao-em-sp-se-reduziu-na-quarentena-contra-coronavirus.shtml?origin=folha>

### RÁDIOAGÊNCIA NACIONAL

**Less Pollution Is One of the Consequences of the Quarantine in São Paulo**

<http://radioagencianacional.ebc.com.br/meio-ambiente/audio/2020-03/menos-poluicao-e-uma-das-consequencias-da-quarentena-em-sao-paulo>

### ECOIA

**Exoert Say Pandemic Depollution May Change the Relationship with Mobility**

<https://www.uol.com.br/ecoa/ultimas-noticias/2020/04/06/despoluicao-na-pandemia-pode-transformar-mobilidade-urbana-diz-especial.htm>



*Compared to previous years, there was a significant reduction in the frequency of maximum concentrations of pollutants exceeding the World Health Organization (WHO) recommended threshold.*

IEMA was asked by the press and partners to express its views on this cause-and-effect relationship, providing numerous interviews and participating in conversations and debates about the issue (see “IEMA in the Press”). In May, David Tsai, a researcher at IEMA, spoke about the topic in the article “[The Close Relationship between Air Quality and the Coronavirus](#),” which addresses how air pollution aggravates the pandemic and the lessons that the current crisis brings to tackling pollution.

Tsai unveiled the first results of an analysis of air quality in the metropolitan region of São Paulo, carried out during the pandemic. Since the second half of March—when social distancing began to be practiced in the city, there’s been a reduction in fine inhalable particles (also called Particulate Material 2.5 or simply PM2.5). There were significant drops in the historical frequency of excess concerning the WHO recommended levels.

However, as for another critical pollutant, ozone (O<sub>3</sub>), there was no decline in levels. The stations that monitor ozone showed a behavior similar to that observed in the last three years, with frequent excess concerning the WHO recommendations. In addition, one of the stations, located in Itaquera, on the east side of the city, drew attention for having more frequent excesses this year than in the three previous years, reaching a “Very Unhealthy” air quality index.

It is worth noting the difficulty of obtaining this type of information for the entire country. The air quality monitoring networks in Brazil are, in general, insufficient and devoid of technologies that allow informing citizens, in real-time, about the air quality. The state of São Paulo is practically the only exception. However, with *lockdown* in urban centers, a quality improvement of the air breath is expected.

It is essential to reflect on how, in the shortest time possible, to develop the capacity to “rebuild better”—

#### AUTOESPORTE

**Pollution Increases the Risk of Death from COVID-19 by up to 15%, Scientists Say**

<https://revistaautoesporte.globo.com/Noticias/noticia/2020/04/ok-editado-poluicao-aumenta-em-ate-15-o-risco-de-morte-pela-covid-19-afirmam-cientistas.html>

#### O POVO

**Social Distancing. Nature Thanks You!**

<https://mais.opovo.com.br/jornal/cienciaesau-de/2020/04/19/distanciamento-social--a-natureza-agradece.html>

#### NEXO

**How the Environment Reacts to the Reduction in Economic Activity**

[https://www.nexojornal.com.br/expresso/2020/05/04/Como-o-meio-ambiente-reage-%C3%A0-redu%C3%A7%C3%A3o-da-atividade-econ%C3%B4mica?utm\\_medium=Email&utm\\_campaign=Boletim-Coronavirus&utm\\_source=nexogeral](https://www.nexojornal.com.br/expresso/2020/05/04/Como-o-meio-ambiente-reage-%C3%A0-redu%C3%A7%C3%A3o-da-atividade-econ%C3%B4mica?utm_medium=Email&utm_campaign=Boletim-Coronavirus&utm_source=nexogeral)

#### ECODEBATE

**Air Pollution in São Paulo Decreases 50% Due to Quarantine**

<https://www.ecodebate.com.br/2020/06/10/poluicao-do-ar-em-sao-paulo-diminui-50-em-virtude-da-quarentena/>

#### GALILEU

**COVID-19 and Pollution: How the Pandemic Affected the Air We Breathe**

<https://revistagalileu.globo.com/Ciencia/Meio-Ambiente/noticia/2020/08/covid-19-e-poluicao-como-pandemia-afetou-o-ar-que-respiramos.html>

in light of the “*build back better*” concept, which is the approach adopted in disaster recovery. It is also urgent to rethink living in the city, reconstructing a less unequal space and a healthier environment. More current urban planning guidelines indicate that active transport (walking and cycling) should be prioritized, followed by collective transport (buses, subways, and trains) and, finally, cars.



PHOTO: Vinícius Low/ Unsplash

## POSTPONEMENT OF PHASE EIGHT OF PROCONVE COULD GENERATE MORE EMISSIONS

Amidst the economic difficulties imposed by the Covid-19 pandemic, the National Association of Automotive Vehicle Manufacturers (ANFAVEA) asked the Brazilian Institute of the Environment and Renewable Natural Resources (IBAMA) to postpone the new phase of the Air Pollution by Motor Vehicles Control Program (PROCONVE) for three years; it applies to heavy vehicles, and it is known as phase P8. It was initially planned to enter into force in 2022, as established by CONAMA Resolution 490/2018.

To enrich and provide a better understanding of the importance of this phase and to support the

decisions of the competent authorities, IEMA carried out a prospective assessment of the impact of the postponement of the P8 on the emissions of nitrogen oxides (NOx) and particulate matter (PM2.5) from road transport in the country. The Institute also gave interviews to the press and followed debates promoted by third sector partners.

Through the assessment carried out, it was possible to analyze the importance of introducing the P8 phase of PROCONVE in the consolidation of a trajectory of reduction of NOx emissions at the national level. The delay in implementing the phase

would imply annual emissions close to 20% higher between 2025 and 2037 concerning the projected values in case of meeting the deadline.

As for PM<sub>2.5</sub>, the assessment points to it as a more challenging control pollutant. Even in the scenario of keeping phase P8 on schedule, the results indicate that this new phase alone is not enough to avoid a trajectory of increasing emissions in the long term. As diesel engines, including diesel-electric hybrids, will tend to predominate in the market, producing a scenario of sustained growth in demand for diesel in road transport, projections indicate that there will be an inflection in the emissions curve, which will increase, possibly as of 2035.

*The delay in the implementation of Proconve's Phase 8 would result in a 20% increase of annual emissions.*

Even so, compliance with CONAMA Resolution 490/2018 proves to be a valuable instrument, which society cannot do without to reach the concentrations of the pollutant at levels compatible with the WHO recommendations to preserve the health of the population. Considering that this technology has been mastered for more than five years by the foreign parent companies of vehicle manufacturing companies in Brazil, the introduction of the P8 phase of PROCONVE in a timely manner, even if insufficient, is essential to achieve such an objective.

Finally, the projections of total PM<sub>2.5</sub> emissions presented in the IEMA assessment evidenced the strong connection between the increase in vehicular activity and the growth in emissions throughout the analyzed horizon, indicating that only the progressive technological improvement of vehicles, despite fundamental, will not be enough to reduce emissions completely. Therefore, emission mitigation strategies that complement the application of new technologies that can bring other socioeconomic benefits are needed. For example, in urban agglomerations, measures are necessary to reduce the need for motorized trips, shorten distances, and promote more efficient modes of transportation.

## IEMA IN THE PRESS

### UOL

**Automakers Pressure to Try to Postpone Changes That Will Make You Breathe Better**

<https://www.uol.com.br/carros/colunas/kelly-fernandes/2020/08/07/pressao-das-montadoras-ten-ta-adiar-mudancas-que-farao-voce-respirar-melhor.htm>

### DIÁRIO DO TRANSPORTE

**IEMA Says Postponement of PROCONVE Could Release up to 20% More Pollutants into the Atmosphere**

<https://diariodotransporte.com.br/2020/10/05/adiamento-do-proconve-pode-lancar-na-atmosfera-ate-20-a-mais-de-poluente-diz-iema/>

**Federal Prosecution Office Maintains Its Position against ANFAVEA and Wants to Postpone the Implementation of Euro 6, Which Would Reduce the Pollution Generated by Brazilian Buses and Trucks**

<https://diariodotransporte.com.br/2020/11/20/mpf-mantem-posicao-contraria-a-anfavea-quer-adiar-implantacao-do-euro-6-para-reduzir-a-poluicao-gerada-pelos-onibus-e-caminhoes-brasileiros/>

### BOM DIA BRASIL/TV GLOBO

**ANFAVEA Asks for the Postponement of PROCONVE, but If It Is Extended, Emissions Could Increase by 20%**

<https://globoplay.globo.com/v/8912556/programa/>

### JORNAL DA CULTURA

**Possible Postponement of Anti-pollution Program**

<https://youtu.be/vCAgCm5dc5s?t=2071>

### PODER 360

**Research Says Postponement of PROCONVE Could Increase Atmospheric Pollution by up to 20%**

<https://www.poder360.com.br/brasil/adiamento-do-proconve-poluir-ate-20-mais-a-atmosfera-diz-pesquisa/>



## MONITORING OF SÃO PAULO'S PUBLIC BUS TRANSIT SYSTEM



PHOTO: Roberto Parizotti / Public Photos

In September 2020, the Monitor de Ônibus SP (SP Bus Monitor) was published. It is an online platform developed by IEMA. Any citizen can follow daily updated indicators on the operation of São Paulo's municipal buses. Atmospheric emissions are the main focus of the tool. Still, other important parameters can also be monitored, such as the fleet in circulation, its environmental technology, the availability of seats, and the average traffic speed of the public bus transit system. These easy-to-understand indicators are generated from a massive volume of geolocation data (GPS) from each of the more than 12 thousand buses that circulate daily in São Paulo.

### ARTICLE

**Le Monde Diplomatique Brasil**  
**The Coronavirus Crisis and the Future of Mobility in São Paulo**

<https://diplomatie.org.br/crise-do-coronavirus-e-o-futuro-da-mobilidade-em-sao-paulo/>

*With fewer cars on the street and greater agility in embarking and disembarking, buses emit 15% less pollutants and GHG per traveled kilometer.*



The indicators present in the platform made it possible to observe changes in public transport caused by the Covid-19 pandemic. It was found, for example, that in the first week of the lockdown in the city of São Paulo, the average speed of São Paulo's buses grew by more than 40% compared to the typical speed pre-pandemic weekdays. That occurred because, with people avoiding movement, a condition thus far unthinkable in urban mobility was created: the significant reduction in the number of cars circulating on the road system. Public transport was thus able to run more smoothly. Without competing with cars for space on the roads, it was as if all the buses started to circulate in exclusive lanes.

In addition to the decrease in cars on the streets, the reduction in passengers due to the pandemic also contributed to this increase in the average speed of the bus system. With fewer lines of people during departures and arrivals, buses spent less time standing at bus stops, reducing the time needed to complete their journeys. Consequently, passengers and public transportation sector workers were able to feel the advantages of a bus operation with less interference from cars on the roads, greater standardization of intervals between buses, and greater comfort inside the vehicles—a model closer to the adequate, and desirable, so-called “new normal.”

By transiting more fluidly, the buses also had less demand on their engines, which led to a

## HEMA IN THE PRESS

### VIATROLEBUS

**Platform Monitors the Implementation and Importance of Electric Buses in Latin America**

<https://viatrolebus.com.br/2020/05/plataforma-monitora-a-implantacao-e-a-importancia-de-onibus-eletricos-na-america-latina/>

### REVISTA AUTOESPORTE

**Transmission of the New Coronavirus through the Air Makes the Car an Ally and a Villain of Public Health**

<https://revistaautoesporte.globo.com/Noticias/noticia/2020/07/transmissao-do-novo-coronavirus-pelo-ar-faz-o-carro-ser-aliado-e-vilao-da-saude-publica.html/>

### PORTAL G1

**Emission of Pollutants from Buses Falls by Half in São Paulo during Coronavirus Pandemic**

<https://g1.globo.com/sp/sao-paulo/noticia/2020/09/22/emissao-de-poluente-por-onibus-cai-pela-metade-em-sao-paulo-durante-pandemia-de-coronavirus.ghtml>

### SP1/ TV GLOBO

**Buses Increase Speed and Emit Less Polluting Gases during Pandemic**

<https://g1.globo.com/sp/sao-paulo/videos-sp1/>

### VEJA

**Pollution Caused by Buses Drops by More than 50% During the Pandemic in São Paulo**

<https://vejasp.abril.com.br/cidades/poluicao-onibus-sp/>

### DIÁRIO DO TRANSPORTE

**Increased Speed of Buses in São Paulo during the Pandemic Led to 15% Fewer Pollutants, the Same Result of Having 2 Thousand Electric Buses in the Fleet**

<https://diariodotransporte.com.br/2020/09/22/aumento-da-velocidade-dos-onibus-de-sp-durante-a-pandemia-atingiu-15-a-menos-de-poluente-o-mesmo-resultado-de-2-mil-onibus-eletricos-na-frota/>

PHOTO: Roberto Parizotti / Public Photos



15% decrease in the emission of pollutants and greenhouse gases per kilometer traveled. An equivalent result would be obtained by adopting nearly two thousand electric buses in the city, which today has just over 200 units of this type of vehicle in its fleet.

However, it was not just positive aspects that could be interpreted using the platform. It was possible to clearly observe the reduction of the total circulating fleet in the first months of the pandemic, precisely when agglomerations had to be avoided as much as possible. Such fleet reduction was probably carried out to balance the drop in revenue caused by the sharp decrease in paying passengers. That exacerbated a weakness that has not been addressed in the country for some time: the cost of public transport is too dependent on the fare paid by the passenger.

Such conditioning of the remuneration of the bus system operation to the payment of fares is criticized insofar as the capacity of buses becomes a revenue-maximizing element for the operator, making it impossible for passengers to enjoy their right to transport in a dignified manner without being subject to overcapacity. In São Paulo, in contrast to most Brazilian cities, the fare revenue is complemented by subsidies from the municipal budget, allowing for the right resumption of bus transit offerings at levels closer to normal.

#### JORNAL DA BAND

**Pollution Caused by Buses Fell by Half in São Paulo during the Pandemic**

<https://youtu.be/hd50tt0WQQU?t=1670>

#### AGÊNCIA BRASIL

**Pollution Caused by Buses Fell by More than Half in São Paulo during the Pandemic**

<https://agenciabrasil.ebc.com.br/geral/noticia/2020-09/poluicao-causada-por-onibus-cai-mais-de-50-durante-pandemia-em-sp>

#### MUNICIPAL CHAMBER OF SAO PAULO

**Moving Average of Deaths by COVID-19 in São Paulo Continues to Fall**

<http://www.saopaulo.sp.leg.br/coronavirus/blog/media-movel-de-mortes-por-covid-19-na-capital-paulista-continua-em-queda/>

#### CBN

**With Lockdown, Average Speed of Buses Increases and Pollution Decreases in Sao Paulo**

<https://cbn.globoradio.globo.com/media/audio/316484/com-isolamento-velocidade-media-dos-onibus-aumenta.htm>

#### OBSERVATÓRIO DAS METRÓPOLES

**World Car Free Day and Mobility Week Put Collective and Sustainable Solutions on the Agenda for Cities**

<https://www.observatoriodasmetrolopes.net.br/dia-mundial-sem-carro-e-semana-da-mobilidade-colocam-em-pauta-solucoes-coletivas-e-sustentaveis-para-as-cidades/>

#### ESTADÃO

**Pandemic Reduces Bus Emissions in the City of São Paulo**

<https://mobilidade.estadao.com.br/meios-de-transporte/pandemia-reduz-as-emissoes-por-onibus-na-cidade-de-sao-paulo/>

#### NTURBANO

**Environmental Gain May Return to Square One Post-pandemic**

[https://www.ntu.org.br/novo/ckfinder/userfiles/files/nturbano\\_47D.pdf](https://www.ntu.org.br/novo/ckfinder/userfiles/files/nturbano_47D.pdf)





PHOTO: Gildson Di Souza/ Secom

# PLANFROTA

## *Renovation of the Bus Fleet in Search of Cleaner Public Transport*

Article 50 of the Municipal Policy on Climate Change of São Paulo, which provides for the use of less polluting and less greenhouse gas-generating motive sources of energy in the urban public transport fleet in the city of São Paulo, establishes that:

“From the date of publication of this law, operators of public transport services by bus, members of the Urban Passenger Transport System of São Paulo, as well as companies that provide solid urban and hospital waste collection services (trash collection) in São Paulo, must promote the progressive reduction of emissions of carbon dioxide (CO<sub>2</sub>) of fossil origin and toxic pollutants emitted in the operation of their respective fleets, through the gradual use of cleaner and sustainable fuels and technologies.” ([Law 16,802, of January 17, 2018](#))

From the enactment of the Law, the goal is to gradually reduce almost all emissions of particulate matter and nitrogen oxides by 2038,

respectively 90% and 80%, at the end of ten years (2028), and 95% for both pollutants at the end of 20 years. For direct emissions of greenhouse gas carbon dioxide (CO<sub>2</sub>) from city buses, the legislation provides for total elimination, 50% within ten years.

To monitor compliance with the goals, IEMA developed, in partnership with SPTrans, the PlanFrota application. It is a tool that estimates reductions in emissions of carbon dioxide (CO<sub>2</sub>), particulate matter (PM), and nitrogen oxides



**PLANFROTA**

*IEMA trained SPTrans technicians, bus company employees and SPTrans partners to use the tool.*

(NO<sub>x</sub>) resulting from different technological configurations of the bus fleets of the city's public transport network operators. This tool is being used by SPTrans and bus operators to plan the renewal of the fleet in the city of São Paulo to meet targets for a gradual reduction of emissions over 20 years, pursuant to contracts for the operation of São Paulo lines of transportation and Municipal Law 16802/18.

At the end of 2019, IEMA trained SPTrans technicians, bus company employees, and SPTrans partners to use the tool. Since then, public transportation companies have started to use

## SHARED MICROMOBILITY

The Sustainable Mobility Laboratory (LABMOB) of the Federal University of Rio de Janeiro (UFRJ), in partnership with IEMA and other organizations, launched the online platform Micromobilidade Brasil (Micromobility Brazil) in July 2020, as well as a report in which they analyze (INSERIR LINK PARA O RELATÓRIO) the situation of shared micromobility systems in Brazil. The website aims to promote and monitor such systems.

The platform mapped a total of 53 public shared micromobility systems in Brazil, distributed in 26 cities. Half of those systems (21 in total) are located in the country's southeast region, and the state of São Paulo concentrates 28% of them. Among the remaining systems, eight are in the south, seven in the northeast, six in the midwest, and only two systems in the North.



PHOTO: Wendel Moretti/ Pexels

PlanFrota to plan the renewal of their fleets to meet emissions reduction targets.

At the October 2020 meeting of the Management Committee of the Program for Monitoring Fleet Replacement with Cleaner Alternatives (COMFROTA-SP), created to monitor compliance with article 50 of the Municipal Policy on Climate Change, São Paulo Transportes (SPTrans) presented the systematized data of the municipal bus fleet renewal plans, delivered by the companies responsible for each concession lot, to meet the emission reduction targets. The numbers show the forecast of a speedy transition to electric propulsion technology by bus operating companies to meet the challenging targets.

From a total fleet of 14,032 buses required in the bid notice for contracting the service, plans indicate the adoption of 12,882 electric buses between 2033 and 2034. That is, almost 92% of the fleet with zero pollutant emissions.





PHOTO: Honório/Unsplash

## MAIN CHALLENGES FOR THE INTRODUCTION OF CLEAN BUSES IN BRAZILIAN CAPITAL CITIES

IEMA analyzed the fundamental aspects of introducing non-polluting buses in 13 Brazilian cities, aiming to mitigate GHG emissions, reduce air pollution, and improve public transport by bus. The organization examined three significant aspects for the feasibility of vehicle technologies and non-polluting alternative energy sources: (i) Mobility Planning; (ii) Climate Policy; and (iii) Contracting of Public Transport Services by Bus. The work made it possible to identify the stage of development of the discussion and the opportunities and challenges for fleet renewal using cleaner technologies.

The executive summary of the survey is available online, and, at the time it was carried out, an open



PHOTO: 3Três Consultoria e Criação/ Unsplash



webinar was held in partnership with the Brazilian Consumer Defense Institute (IDEC) and the Transport and Development Policy Institute (ITDP), which also conducted studies on bus tenders in 12 capital cities to publicize the problems raised to the public.

The study included the 12 most populous Brazilian capital cities—Belém, Manaus, Brasília, Curitiba, Fortaleza, Belo Horizonte, Goiânia, Recife, Rio de Janeiro, São Paulo, Porto Alegre, Salvador—and the city of Campinas, located in the state of São Paulo, where the discussion about implementation of clean public buses is advancing. According to the documents analyzed, the introduction of buses with alternative technologies to diesel in public transport is not a topic assimilated by cities in general.

It was also found that only São Paulo, Campinas, and Belo Horizonte have concrete actions to adopt other technologies. The city of São Paulo, for example, has a legal and contractual requirement to eliminate emissions, Campinas included the electrification of part of the bus fleet in the bid notice, and Belo Horizonte prepared a proposal for a pilot test project with electric buses.

*The introduction of buses with alternative technologies to diesel in public transport is not yet a subject is, by and large, not yet a subject assimilated by cities.*

#### HEMA IN THE PRESS

##### ECOIA

**COVID-19 Crisis Paves the Way for Electric Buses and Less Polluted Future**

<https://www.uol.com.br/ecoia/ultimas-noticias/2020/05/04/crise-da-covid-19-abre-caminho-para-onibus-eletrico-e-futuro-menos-poluido.htm>

##### EXAME

**Why Is Planning Cities So Important?**

<https://exame.com/blog/ideias-renovaveis/por-que-planejar-as-cidades-e-tao-importante/>

# TRANSPORT AND LOGISTICS INFRASTRUCTURE IN THE LEGAL AMAZON

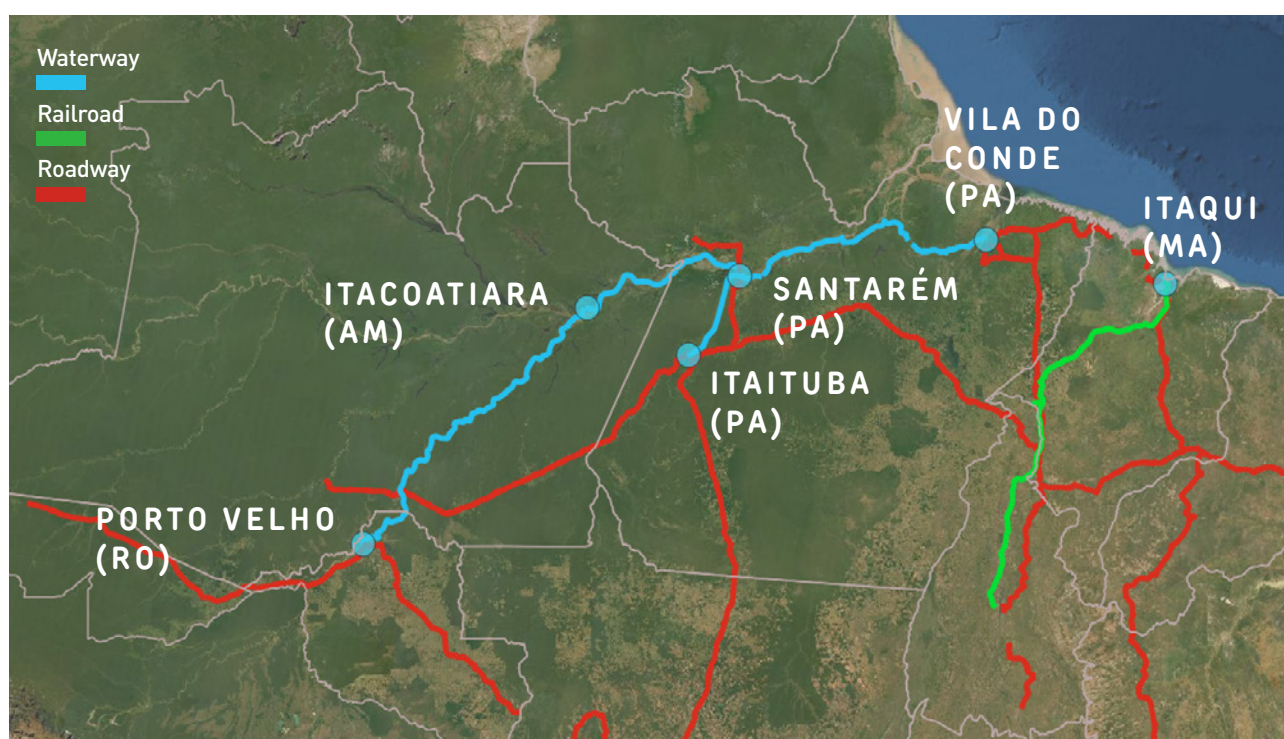
To qualify spaces for dialogue and strengthen the capacity of civil society organizations operating in the Legal Amazon to debate and make proposals on the decision-making process for the implementation of transport infrastructure projects in the region, IEMA developed the following studies throughout 2020:

- 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 socio-environmental risks arising from it;
- Mapping weaknesses and opportunities to improve the

institutional, legal and regulatory framework of national decision-making processes on freight transport.

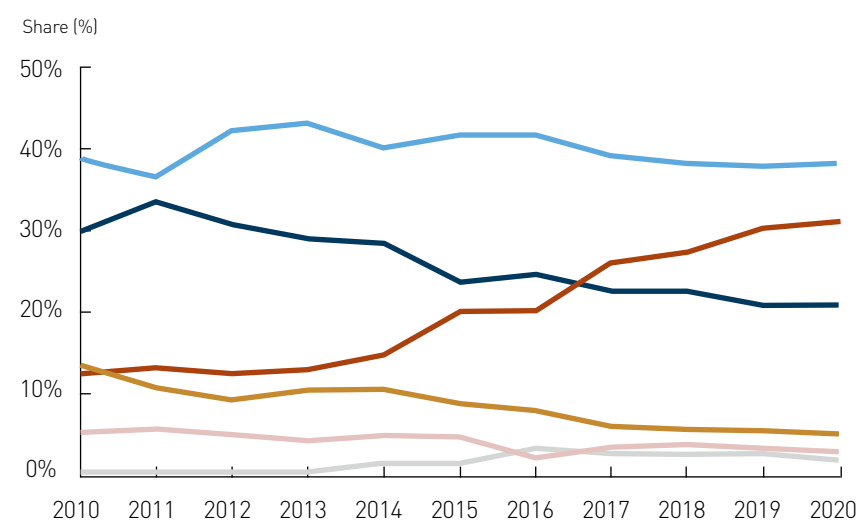
Our studies show that most freight transport infrastructure projects proposed by the federal government have been designed to structure transport corridors that reinforce the recent soy and corn exports trend through the ports of the so-called Arco Norte (North Arch; see Figures X and Y).

Given the social and environmental risks represented by the identified projects and corridors, most of them located in the Tapajós River Basin, the results of the studies point to the need to seek other future scenarios for freight transport infrastructure in the Amazon, in contrast to those proposed by the federal government for the region.



Fonte: IEMA

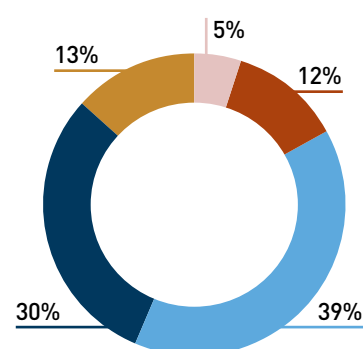
## EVOLUTION OF SOYBEAN AND CORN EXPORTS VIA BRAZILIAN PORTS



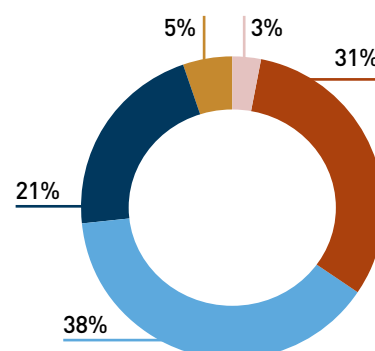
**North Arc** **Santos** **Paranaguá-Antonina** **Vitória** **Aratu-Salvador** **Other ports**

**Source:** ANTAQ Statistical Data. Selected ports to represent the export possibilities of grains produced in the Midwest, Northeast, and North of the country.

2010



2020



To share the conclusions of the studies developed and, mainly, to promote the training of civil society organizations, IEMA, in cooperation with GT-Infraestrutura (Infrastructure Working Group)—a network formed by more than 40 civil society organizations, promoted three webinars:

1. August 13, 2020: Transport Infrastructure Projects in the Amazon – Brazilian Government Proposals.
2. September 19, 2020: Transport and Logistics Infrastructure: Opportunities during the Planning and Policy Stages of the Decision-Making Process.
3. December 16, 2020: The “North Arc” and the Search for New Logistical Scenarios.

### ARTICLE

#### NEXO

**Amazon: How to Have a Sustainable Infrastructure**  
<https://www.nexojournal.com.br/ensaio/2020/Amazon-C3%B4nia-como-ter-uma-infraestrutura-sustent%C3%A1vel>

### IEMA IN THE PRESS

#### EXAME

**Big Forest, Small Projects**  
<https://exame.com/blog/ideias-renovaveis/floresta-grande-projetos-pequenos/>



# OPERATIONAL MANUAL FOR THE MAIS LUZ PARA A AMAZÔNIA PROGRAM



PHOTO: Divulgação/ IEMA

During 2020, IEMA actively participated in meetings and debates promoted by the Energy and Communities Network, of which we are a member, to foster sustainable regional development in the Amazon. Among the works carried out by the Network, the elaboration of proposals for the improvement of the Operational Manual of the *Mais Luz Para a Amazônia* (More Light for the Amazon) Program (2020-2022) stands out. Among the recommendations made in the public consultation process there were:

- Both the program goals and the deadlines of the executing agents must be oriented to each territory and subject to public consultation;
- The creation of regional councils with adequate capillarity is suggested to address the different territorial realities appropriately. In addition, such councils could also expand society's ability to monitor the investments made by the Program;
- The annual budget for the *Universalização do Acesso à Energia Elétrica* (Universal Access to Power) Programs to be allocated to the Energy Development Account (*Conta de Desenvolvimento Energético*, CDE) should be submitted to a public hearing by the Ministry of Mines and Energy;
- Consider the current and repressed demand for electrical energy through a diagnosis of social, cultural, and productive activities;
- Evaluate in advance the demand for productive activities and then propose the best technological arrangement;
- Include the training of local professionals on the responsibility of the executing agent and consider reverse logistics.

## IEMA IN THE PRESS

### RÁDIOAGÊNCIA NACIONAL

**No to Difficulty: Students from Far Away Attend Classes via Radio**

<https://radioagencianacional.ebc.com.br/educacao/audio/2020-06/nao-dificuldade-estudantes-de-lugares-longinquos-assistem-aulas-pelo-radio>

### CANAL ENERGIA

**Organizations Ask for Cost Transparency in the Covid-Account Emergency Plan**

<https://www.canalenergia.com.br/noticias/53136321/organizacoes-pedem-transparencia-em-custos-da-conta-covid>

Access to the set of suggestions made for the Operational [Manual of the Mais Luz Para a Amazônia Program \(2020-2022\)](#) can be [accessed online](#).

### The Covid-Account Emergency Plan for the Electrical Energy Sector

Covid-19 affected the financial situation of electric companies due to the drop in their revenues. To tackle such a situation, the federal government proposed loans to electric companies through an emergency plan called Conta-Covid (Covid-Account). Given the fact that society will pay for the government's billion-dollar aid to the Brazilian electrical energy sector, in May 2020, nine organizations, including IEMA, launched a

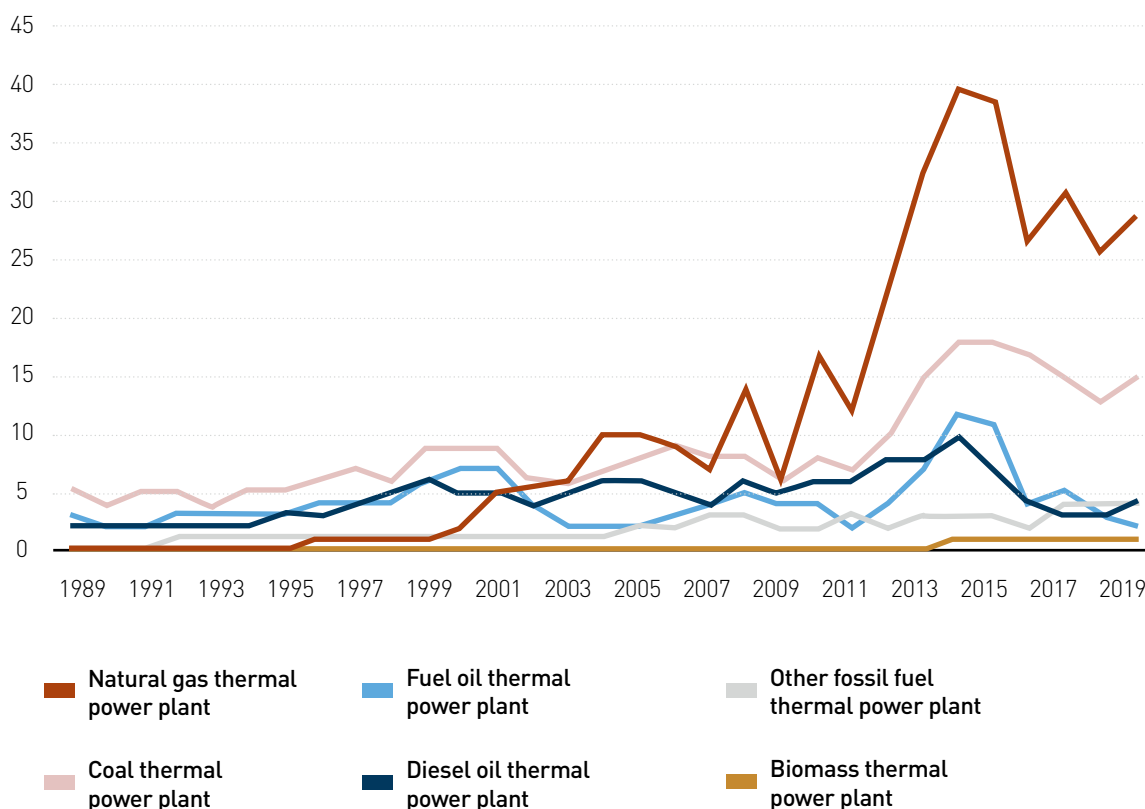
manifesto defending transparency concerning the costs of financial operations and made a series of recommendations to the government, National Electrical Energy Agency (ANEEL), and Congress.

### Inventory of Emissions from Thermal Generation

Annually, IEMA prepares an inventory of atmospheric emissions from thermal generation in Brazil. In 2019, 53.4 million tons of CO<sub>2</sub>e were emitted by the plants in operation, highlighting those using natural gas, which accounted for 55% of the total emitted. The inventory results are available annually in the Greenhouse Gas Emission Estimation System – [SEEG](#), where data on atmospheric emissions at the plants, broken down by energy source, can be accessed.

## GHG EMISSION PER ENERGY SOURCE

MtCO<sub>2</sub>e GWP-AR5



Source: IEMA

# SPECIAL PROJECTS



PHOTO: Jonathan Borba/Unsplash





## SEEG

The Greenhouse Gas Emission Estimation System (SEEG), an initiative of Observatório do Clima (Climate Observatory), presented, for the eighth consecutive year and during an announcement webinar, the estimates of Brazilian emissions. IEMA carried out the survey for the energy and industrial processes sectors.

The energy sector accounted for 19% of Brazil's total emissions in 2019. The survey shows that, in 2019, there was a slight increase in energy emissions: a 1% increase compared to the previous year, rising from 409.3 million to 413.7 million tons of emitted carbon dioxide equivalent (CO<sub>2</sub>e).

Among the reasons for such rise is an increase in electricity consumption in the country, which led to greater use of thermal power plants, especially those powered by natural gas, even in a scenario in which, compared to the previous year, there was an increase in generation in hydroelectric power plants. In addition, there was an increase in the use of diesel in freight (essentially trucks), one of the primary consumers of fossil fuels in Brazil.

### ENERGY FUTURE

In September, the Brazilian Society for Energy Planning (SBPE) promoted the XII Brazilian Conference on Energy Planning with the theme "Security and Sustainability in the Energy Future." André Luis Ferreira, Executive Director of IEMA, took part in the "Urban Infrastructure and Energy Transition: How to Reconcile Them?" panel.

Emissions from industrial processes and product use, which closely follow the dynamics of GDP, fell by 2% from 2018 to 2019 – from 101.1 million tons of CO<sub>2</sub>e in 2018 to 99.1 million in 2019. Those emissions represented 5% of Brazil's total that year. On the [Climate Observatory's](#) YouTube channel, there was a discussion on energy and industrial processes emissions.

### ARTICLE

#### **Brazilian Emissions of Greenhouse Gases in the Energy and Industrial Processes Sectors in 2019**

<http://energiaeambiente.org.br/as-emissoes-brasileiras-de-gases-de-efeito-estufa-nos-setores-de-energia-e-de-processos-industriais-em-2019-20201201>

### PUBLIC AND LOW-EMISSION TRANSPORT

There are only 350 electric buses in circulation in public transport systems in Brazil. Still, this number is already responsible for avoiding 42.43 kt of carbon equivalent per year—if the same buses were powered by diesel. The data was taken from the new E-Bus Radar platform, launched in May 2020 by LABMOB/UFRJ in partnership with the ZEBRA project. It received support from the Instituto Clima e Sociedade (ICS) and the collaboration of IEMA to estimate avoided emissions of carbon dioxide.



# MAPBIOMAS

MapBiomas Collection 4.1, covering the period 1985-2019, was published—an Annual Mapping Project of Land Cover and Land Use in Brazil that processes satellite images and generates the country's annual land cover and land use maps. The tool helps to understand the Brazilian territory's historical evolution and assess the consequent impact of human activities.

IEMA collaborated to include layers of information on infrastructure, bringing together the most up-to-date official databases. It is essential to recognize the role of the installation of transport and energy infrastructure as drivers of transformation, positive or negative, in communities and the surrounding landscape.

In 2020, the 5th Annual Brazilian Land Use and Land Cover Map Collection was launched online, with improvements and the inclusion of the year 2019, during the 5th Annual MapBiomas Seminar. For the third consecutive year, IEMA has made available the most up-to-date information on the country's infrastructure, collecting and organizing geo-referenced data on Brazil's transport and energy infrastructure. That time around, a new feature was introduced: data mining layer. A special debate was held on the layers of transport, energy, and mining.

## SHARED MICROMOBILITY

The Sustainable Mobility Laboratory (LA-BMOB) of the Federal University of Rio de Janeiro (UFRJ), in partnership with IEMA and other organizations, launched the online platform Micromobilidade Brasil (Micromobility Brazil) in July 2020, as well as a report in which they analyze the situation of shared micromobility systems in Brazil. The website aims to promote and monitor such systems.

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# INSTITUTIONAL DEVELOPMENT

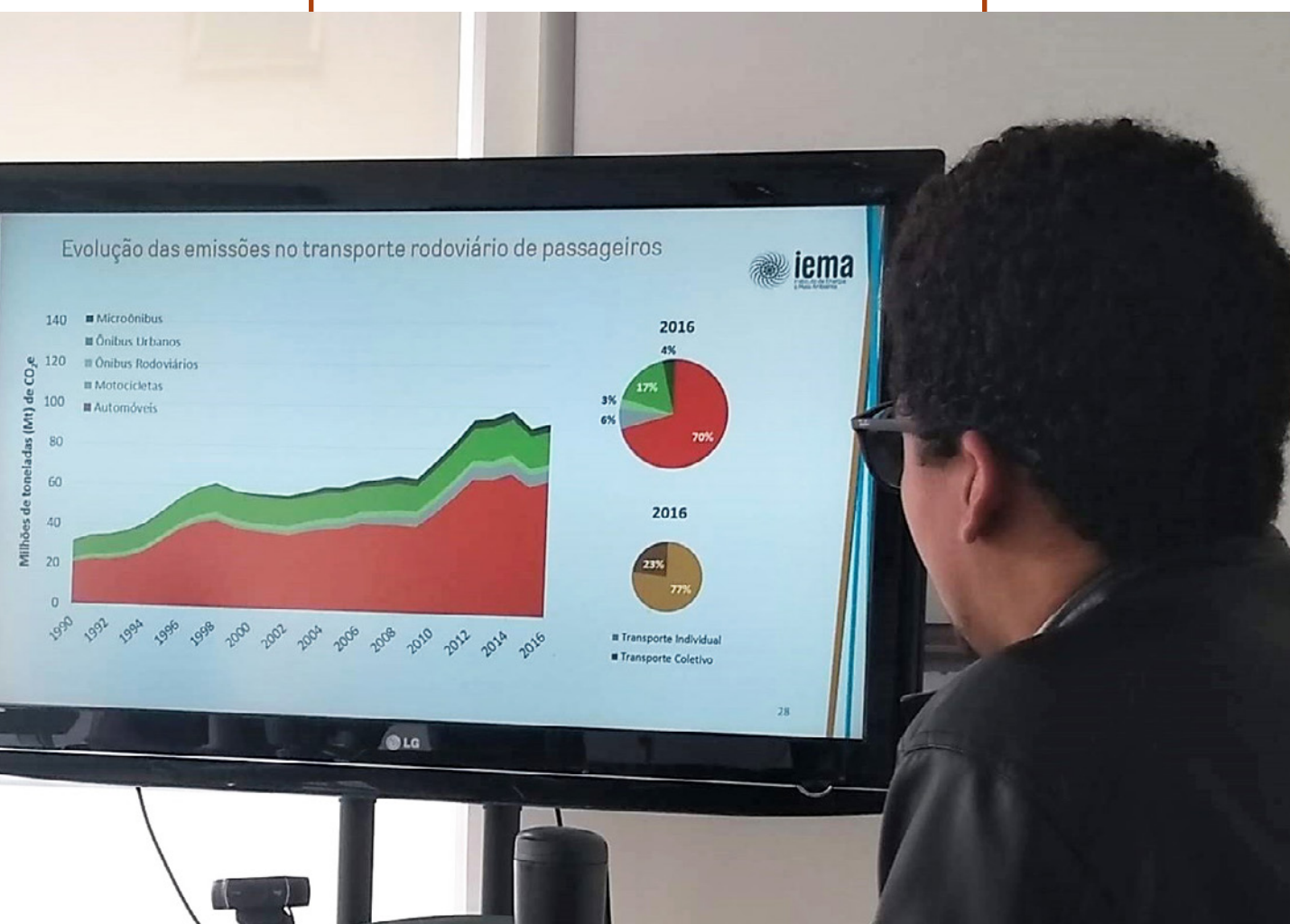






PHOTO: Nareela Martin/Unsplash

Previous analyses indicate that a Brazilian think tank organization is necessary, acting in the energy and environmental fronts, which can be a technical reference for organized civil society. IEMA is in a unique position in the spectrum of Brazilian organizations with the potential to fulfill such a role. Thanks to its action proposal, it has an accurate technical production. It establishes a dialogue with the public administration, private sectors, and third sector organizations. Activities were carried out throughout the year to realize IEMA's full potential for institutional improvement and strengthen its management through strategic actions.

*Strengthen governance,  
management, and  
communication, as well  
as the promotion and  
training of the team*

# COMMUNICATIONS

In 2020, IEMA's Communications department continued highlighting the institution as an instrument of change, pointing out ways for the country to ensure the sustainable use of natural resources with socio-environmental protection, in line with the Institutional Strategic Planning, in force until 2024. For that, each project had its communication plan developed and implemented. Adaptations were also made to meet the needs considering the Covid-19 pandemic scenario in the country.

The beginning of closer communication with decision-makers should be highlighted among the activities carried out. Since 2020, the studies carried out by IEMA have been nominally sent to representatives of the three Branches of Power, according to the research topic and the work of each one of them. Partner organizations also received links to the studies even before they were released to the press and the general public to ensure that the results could support the qualification of decision-making processes.

The communication activities contributed to the repercussions, result, and impact of the studies and analyses carried out by IEMA in 2020, already described in the "2020 Main Actions" section. Below are some performance indicators:

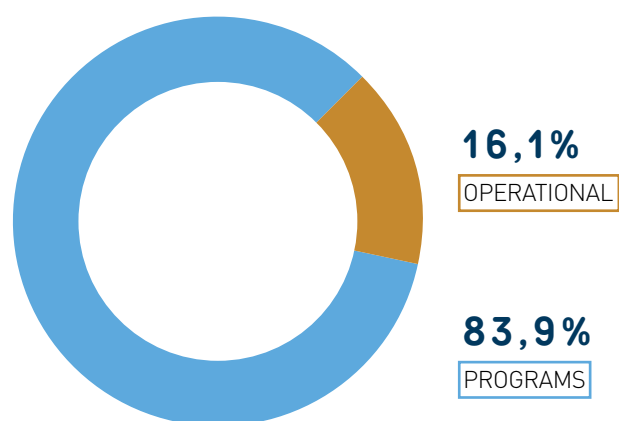
- 50% increase in the newsletter's subscriber base;
- IEMA had 203 press mentions (the number includes interviews given);
- Closer relationships with specialized media such as Mobilize, Diário do Transporte, NTU Magazine - National Association of Urban Transport Companies, Página 22 (FGV);
- Closer relationships via participation in events and working groups of networks and partners, such as the Climate Observatory, Infrastructure Working Group, Rede Energia e Comunidade, Climate Observatory Working Group of Gender and Climate, LABMOB/UFRJ, Coalizão Respirar, and ClimaInfo.

Regarding social networks, 110 posts were published on Facebook and LinkedIn, 150 on Twitter, 49 on Instagram, and 72 stories – with 2,500 interactions. On LinkedIn, most followers are from the oil and energy area (27%), followed by those linked in some way to environmental services (7%). On Twitter, followers come from social, civil rights movements, institutes, teachers, and legal professions.

# SUPPORTERS AND FINANCIAL INDICATORS

## USE OF RESOURCES

	2020
Team	R\$ 2.139.358
Third Parties	R\$ 810.920
Travel / Conferences	R\$ 17.306
Occupation / Infrastructure	R\$ 197.026
General / Taxes	R\$ 55.030
	<b>R\$ 3.219.640</b>



## SUPPORTERS (2020)

Charles Stewart Mott Foundation  
 Climate and Land Use Alliance (CLUA)  
 Deutsche Gesellschaft für  
 Internationale Zusammenarbeit (GIZ)  
 Instituto Centro de Vida (ICV)  
 Instituto Clima e Sociedade (iCS)  
 Oak Foundation  
 Observatório do Clima (OC)



## BALANCE SHEET

December 31, 2020 and 2019 (In BRL)

ASSETS	2020	2019
<b>CURRENT</b>		
Cash and cash equivalents	4.363.590	3.821.189
Prepaid expenses	44.385	1.192
Other accounts receivable	131.893	181.234
	4.539.868	4.003.615
<b>NONCURRENT ASSETS</b>		
Fixed assets	118.068	102.103
	118.068	102.103
<b>TOTAL ASSETS</b>	<b>4.657.936</b>	<b>4.105.718</b>
LIABILITIES AND NET ASSETS	2020	2019
<b>CURRENT</b>		
Suppliers	49.693	85.270
Tax obligations	90.832	104.656
Employment and social security obligations	223.664	226.794
Advance donations	1.947.918	1.303.657
	2.312.107	1.720.377
<b>NET ASSETS</b>		
Net assets	2.339.716	2.406.367
Investment donations	45.625	45.625
Surpluses for the year	(39.511)	(66.651)
	2.345.829	2.385.341
<b>TOTAL LIABILITIES AND NET ASSETS</b>	<b>4.657.936</b>	<b>4.105.718</b>

## BOTTOM LINE

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

	2020	2019
<b>OPERATING REVENUE</b>		
<b>With restriction</b>		
Donation revenue	3.155.733	3.534.605
<b>Unrestricted</b>		
Voluntary donations	-	-
Other revenues	11.044	1.394
Volunteer activities	15.909	17.273
	3.182.686	3.553.272
<b>PROJECT COSTS</b>		
Contractors	(810.920)	(1.040.976)
Personnel expenses	(2.139.358)	(2.162.520)
General	(248.129)	(455.876)
Tax	(21.233)	(19.452)
	(3.219.640)	(3.678.825)
<b>GROSS OPERATING SURPLUS</b>	<b>(36.955)</b>	<b>(125.553)</b>
<b>OPERATIONAL EXPENSES</b>		
Volunteer activities	(15.909)	(17.273)
General and administrative expenses	(23.864)	(71.613)
Depreciation	(17.549)	(20.805)
	(57.322)	(109.691)
<b>RESULT BEFORE FINANCIAL INCOME AND EXPENSES</b>	<b>(94.276)</b>	<b>(235.244)</b>
Financial expenses	(25.646)	(45.268)
Financial revenue	80.411	213.861
	54.765	168.593
<b>SURPLUS FOR THE PERIOD</b>	<b>(39.511)</b>	<b>(66.651)</b>



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