



PROMOB

2017-2021

E-MOBILITY IN BRAZIL

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PROMOB-E TIMELINE

Learn more about the milestones reached by PROMOB-e as well as those reached in the context of e-mobility since PROMOB-e's launch in 2016

8 to 29

IMAGES

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This publication presents the main outcomes achieved by the Energy Efficient Propulsion Systems PROMOB-e, an international cooperation project between Brazil and Germany which operated from 2017 to 2021 in supporting Brazil in reducing emissions of greenhouse gases by promoting e-mobility solutions.

We will address the global agenda for sustainable development and how e-mobility relates to the agenda's goals. We will also show trends, dynamics and opportunities brought by e-mobility in Brazil and around the globe. PROMOB-e's intervention logic will be thoroughly shared as well as its main outcomes, with special attention given to publications and case studies.

In addition, we have gathered information on the major events of e-mobility during said period to be presented ahead in a timeline in this publication.

We hope you enjoy the reading!






“E-mobility connects the transformations our cities are undergoing with those of our energy systems. **PROMOB-e** has partnered with important actors of the Brazilian electric power sector, such as ANEEL, EPE and other electricity suppliers.

Hence, the project gave automakers, electricity suppliers and research institutes support to work together towards innovative solutions for e-mobility in R&D projects carried out by ANEEL.

Creating the Recharging Infrastructure working group in the context of the National Platform for Electric Mobility (PNME) secured the dialogue about mobility decarbonization to thrive.”

Dr. Johannes Kissel

Renewable Energy and Energy Efficiency Manager,
GIZ Brazil



IMPLEMENTING SOLUTIONS that contribute to achieving the sustainable development goals is a must to our society in the contemporary world. The international cooperation project Energy Efficient Propulsion Systems PROMOB-e was implemented with the purpose of supporting Brazil in reducing emissions of greenhouse gases (GHG) by promoting e-mobility solutions for that matter.


The project, in operation from 2017 to 2021, partnered with the Brazilian Ministry of Economy and the German Federal Ministry for Economic Cooperation and Development (BMZ). Throughout its implementation, more important partners came aboard, such as the Ministry of Regional Development (MDR), the academia, regulatory agencies, the industry, the energy sector and many civil society organizations.

That is, indeed, one of PROMOB-e's most striking features: its ability to promote and strengthen cooperation among diverse actors and provide synergy to fight off the complex challenge of reducing GHG emissions to slow down global warming.

In its first stage, PROMOB-e worked towards the technological development of e-mobility in Brazil. The project offered support to the formulation of strategies and public policies targeted for promoting energy efficient propulsion systems, it supported the creation of normative/regulatory instruments and it also embraced business models and pilot projects for energy efficient propulsion systems.

The project focused on working towards public transportation and urban freight fleet electrification. That choice was made so we could innovate, implement large-scale actions, come up with integrated and replicable solutions in an effective manner that contributes to improving citizens' quality of life. And people are at the center of the agenda for sustainable development.

The world's intense and accelerated pace of transformation brought cities to be at the heart of the sustainable development process. That reinforces the need to integrate e-mobility to urban mobility in a broader way. The sectors have been reluctant



to collaborate on various national and international occasions.

Moreover, in light of the ongoing global pandemic situation, e-mobility has proved an excellent solution for the economic recovery of the country.

PROMOB-e focused on collaborating and cooperating by adopting a set of methods and instruments that strengthened capacities composed by publications, studies, events and situations that were favorable to foster and build up collaboration and cooperation.

International cooperation projects like PROMOB-e are usually implemented with a deadline for completion. By the end of this project, whose results will be presented in this report, we can see PROMOB-e's legacy and its contributions made to support Brazil in achieving its global warming reduction goals by adopting e-mobility.

The knowledge and the lessons learnt from the activities of PROMOB-e in the field of electric bus

deployment in Brazil are also useful for the E-Bus Mission of the Transformative Urban Mobility Initiative (TUMI). The TUMI E-Bus Mission (<https://www.transformative-mobility.org/campaigns/tumi-e-bus-mission>) is commissioned by the German Federal Ministry for Economic Cooperation and Development (BMZ) and being implemented by the German Agency for International Cooperation (GIZ) together with several partners in Africa, Asia and Latin America, including Brazil. The legacy of collaboration and cooperation, knowledge and fostering of the sector in Brazil was a significant boost to the creation of the National Platform for Electric Mobility.

Thank you to each of those who helped us build our story and contributed to the growth of e-mobility in Brazil and those who found solutions to achieve sustainable development.

Jens Giersdorf and team

PROMOB-e

The global agenda for sustainable development

HUMANITY IS LIVING THROUGH A DEFINING MOMENT. Climate changes are at the center of the global agenda for development and have brought about transformations in all sectors. Coping strategies for those issues have become stronger in the global context some decades ago.

In order to coordinate efforts to combat global warming, the United Nations (UN) has outlined and presented global goals to which countries have committed to prioritize.

The climate issue has been taken seriously over the last five decades. In 1972, the UN held the United Nations Conference on the Human Environment in Stockholm. That was

the first world conference to make the environment a major issue and resulted in the report "The Limits to Growth", on the importance of reflecting on development.

Twenty years later, The United Nations Conference on Environment and Development (UNCED), also known as Eco-92, was held in Rio de Janeiro, 1992. It resulted in a first draft of an action plan and strategies to promote a new pattern of global development for the 21st century. The UN member states adopted, then, the Agenda 21.

In Eco-92, besides committing to reducing GHG emissions, the Convention on Forests was established, which originated the Con-

PROMOB-e timeline

From here on you shall visualize the project's major milestones along its timeline



 milestones reached by PROMOB-e  milestones reached in the context of e-mobility

vention on Biological Diversity (CBD). That represents the importance of ecosystem services for people and the planet.

Five years later, the United Nations Conference on Climate Change took place in Kyoto, Japan, aiming to establish commitments to reduce greenhouse gases (GHG) emissions. The Kyoto Protocol implemented that the most industrialized countries should reduce GHG emissions by at least 5 per cent below the 1990 levels in the commitment period of 2008 to 2012. The alarm for change became louder. The Protocol, however, was not signed by all member states.

In 2000, the United Nations supported by 191 countries established the eight Millennium Development Goals: eradicate extreme poverty and hunger, achieve universal primary education, promote gender equality and empower women, reduce child mortality, improve maternal health, combat HIV/AIDS, malaria, and other diseases, ensure environmental sustainability, and develop a global partnership for development. The MDGs placed



Timeline graphic with a dashed red line at the top and a green background with topographic patterns. It features a central vertical dotted line separating the years 2016 and 2017. The 2016 section includes a dark grey box with the text 'PROMOB-e was launched'. The 2017 section is divided into two columns for 'april' and 'may', each with an icon and a description of an event. The timeline is decorated with various icons representing energy, nature, and technology.

2016

PROMOB-e was launched

2017

april

Workshop on Renewable Energy and Interconnected Innovations • Sustainable Markets in the 21st Century

may

ANEEL's Public Hearing • Improving the regulation for EV energy supply requirements

human beings at the center and highlighted the importance of the environment and set the context for development.

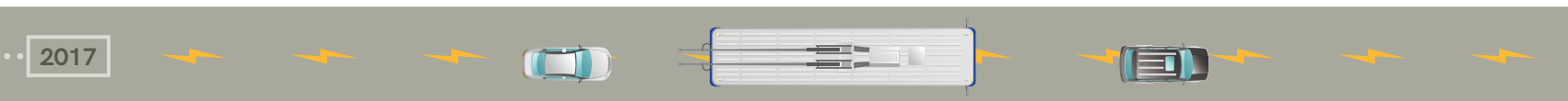
Two decades later, in 2002, Rio+20 carried out an assessment of the progress made over the years, the remaining gaps and other emerging challenges. New commitments were made, which strengthened the concept of "sustainable development". During this entire period, the climate issue worsened and the understanding of systemic changes was deepened, which led to the need for a more focused action with greater commitments by all nations.

In 2015, then, a new development agenda was adopted, setting goals for the next 15 years. The 2030 Agenda, signed by 195 countries, is a global action plan that established 17 Sustainable Development Goals (SDGs) and 169 targets to end poverty, protect the planet and improve the lives and prospects of everyone, everywhere, within the limits of our planet. Eradicating poverty remains the greatest global challenge and a condition necessary for establishing sustainable development.

SDG 13 is about **about "Climate Action"**, which embraces the importance of taking urgent action to combat climate change and its impacts. Climate change is a transnational event, whose impacts are disrupting national economies and affecting people everywhere, especially those most vulnerable populations in developing countries. Without immediate action on climate change, Earth is on track for a temperature rise of over 3 °C by the end of the 21st century.

The SDGs are complementary in several directions. One of them, in particular, aims at climate change.

Working towards actions against global climate change, during the Conference of the Parties (COP 21), held in Paris in 2015, the Paris Agreement was adopted in the context of the United Nations Framework Convention on Climate Change. The Agreement was approved in 2016 and its long-term temperature goal is to keep the rise in global

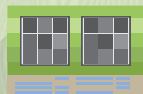


2017

may



International seminar on EV Charging by ANEEL and GIZ



september



Technical visit to Bonn, Aachen and Frankfurt • Political purposes



Institute of Hybrid and Electric Vehicles (SENAI/PR) and Postgraduate Degrees in Hybrid and Electric Vehicle Engineering



13 CLIMATE ACTION



Some of the effects of climate change are the increased average global temperature, increased heat wave frequency and length, increased precipitation variability, water scarcity, ocean acidification and increase in sea surface temperatures and rising sea level. That results in the incidence of long-term drought periods, the disappearance of water bodies (such as weirs, dams and rivers), the disappearance of species, floods and tropical storms, agricultural productivity losses, depletion of fish stocks, disease outbreaks, among others. Examples like these affect, for instance, public health, food security, economic production, urban infrastructure, water supply, the sanitation system, that is, several aspects that directly impact the lives of each one of us.

october



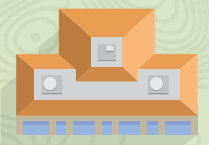
Creation of the GT7 • a group formed to design the plan for developing e-mobility in Brazil based on the participation of and dialogue among sectors and institutions that represent ministries, government-owned companies, regulatory agents, standards bodies, associations, labor unions, research centers and universities.



Brazil-Germany E-mobility Forum



Technical visit to Germany • E-mobility power system (Study regulations purposes)



average temperature to well below 2°C above pre-industrial levels and to pursue efforts to limit the increase to 1.5°C.

Brazil has committed to all global agreements concerning sustainable development and climate. With each commitment, the signatories are dedicated to establishing national plans that work towards solutions in the directions indicated by the agreements.

In its Nationally Determined Contributions (NDCs) Brazil intends to commit to reduce carbon dioxide emissions by 37% below 2005 levels by 2025 and 43% below 2005 levels by 2030.

This implies accelerating transformations and achieving active engagement. Although it is a national commitment made at the government level, it requires the participation of all sectors and all people so that it can be achieved.

Aiming at reducing GHG emissions, Brazil's mitigation actions to implement its NDCs are characterized by:

- Increasing the share of sustainable biofuels in the Brazilian energy mix to approximately 18%
- Strengthening and enforcing the implementation of the Forest Code
- Restoring and reforesting 12 million hectares of forests
- Achieving, in the Brazilian Amazonia, zero illegal deforestation
- Achieving 10% efficiency gains in the electric power sector
- In the industry sector, promote new standards of clean technology
- In the transportation sector, further promote efficiency measures
- Improve infrastructure for transport and public transportation in urban areas

Such a scenario calls for immediate changes: according to the *World Resources Institute* (WRI), global annual greenhouse gas emissions have grown 41% since 1990, and they are still climbing.

2018

january



Enactment of Law
16,802/São Paulo



february



Study on Governance
and Public Policies
for EVs



Launch of the
Mobility City
Lab Report



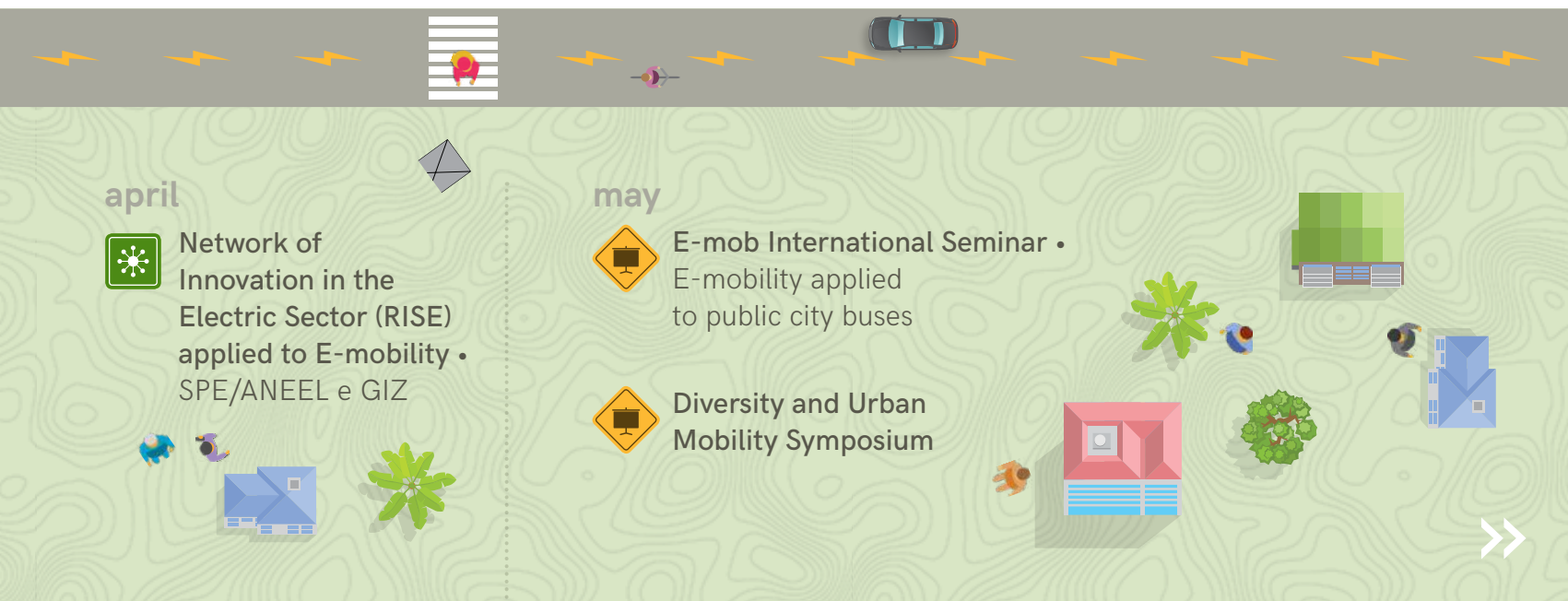
The transportation sector is responsible for 15% of total CO₂ emissions. Not only does this date pose a challenge, but it is also an opportunity that leads us to a significant contribution to the climate issue: the transition to e-mobility.

We are living through climate change in a populous planet inhabited by more than 7 billion people and growing consumption expected. Despite the challenging scenario, we are, on the other hand, aware of the finiteness of resources, accelerated scientific and technological advances and highly effective communication skills. In this context, energy efficiency and environmental conservation become important instruments when establishing sustainability.

The COVID-19 pandemic aggravated the already challenging situation and shed light on the urgency about effective interventions. On the one hand, it presented itself as a sample

of the environmental catastrophe that global warming can cause, both for human health and for economic activities. On the other hand, social isolation made it possible to see the immediate effects upon the reduction in GHG emissions around the world.

It was then that the so-called green recovery gained momentum as a proposal to promote economic recovery based on sustainable development. ●



E-mobility in Brazil and around the world: its trends, dynamics and opportunities

ALL OVER THE WORLD, the EV market has been growing at a fast pace. Market growth indicates the presence of a strong political-institutional context as well as favorable regulations, accelerated technological advances, intense scientific production and research, available funding opportunities and, above all, it indicates the presence of demand, that is, people, companies and governments see the benefits of e-mobility.

Some countries have already drawn up policies to reduce emissions from transportation. More aggressively, some of them have announced plans to ban the production and sale of combustion engine-powered vehicles altogether.

The global forecast is EV sales growing to 10 million units sold in 2025, then reaching 19 million by 2030.

2018

june



Route 2030 program (MDIC) • Aims to support technological advances, promote competitiveness and innovation, establish vehicle safety standards, act to protect the environment through energy-efficient propulsion systems, and maintain high quality standards for automobiles, trucks, buses, chassis with engine and auto parts.



Seminar Envisaging E-mobility in Brazil • A look at the different technological routes"



What e-mobility means

Electric mobility is about the electrification of transportation, that is, using electric energy as a source for vehicle propulsion systems, which can be used in the most diverse applications, such as for transporting passengers, cargo or for industrial activities, such as mining.

Electric motors totally or partially replace internal combustion engines. In this way, the burning of fossil fuels, such as petroleum products, is replaced by energy as a source of propulsion. This means that there is less greenhouse gas emissions and that the electrification of transportation helps to combat global warming.

If we consider that Brazil has a predominantly clean energy matrix, that is, not based on energy sources from fossil fuels, but those which are generated

predominantly from hydroelectric plants and renewable sources such as wind and sunlight, the strategy of adopting electric propulsion vehicles gets even more attractive. Furthermore, electric vehicles cause less noise pollution, which results in an indirect beneficial effect especially for urban centers.

There are several types of electric vehicles (EVs) such as buses, trucks, cars, scooters or bicycles. The first electric cars were built in the early 20th century and were produced again in the 90s, as a sustainable alternative in order to contribute to the reduction of pollutant emissions, one of the central concerns of the global development agenda.



Technical visit
Berlin • RISE



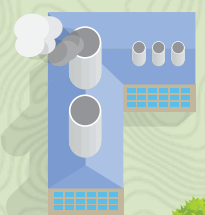
Resolution n. 819/2018 •
Distribution Services Regulation
Superintendence (SRD) of ANEEL •
Establishes the procedures
and conditions for EV charging



july



Route 2030 program
was launched



We can find initiatives in the market for promoting the electrification of public transportation aimed at replacing entire commercial fleets as well as operations for manufacturing individual light and ultra light-duty vehicles, and initiatives for manufacturing luxury EVs.

But there is a huge development context structured around the process to allow vehicles, as end products, to reach consumers. They are important factors for e-mobility to take place effectively.

Vehicle availability is one of them and depends directly on technological advances. Batteries are the great focus of most development efforts today.

The regulation of the sector is also a very relevant factor. Countries with successful experiences in e-mobility, such as Germany, have effective regulatory operating models that encourage market development. Tax incentives and subsidies can make all the difference to buyers of EVs, both from the consumer market and the business market.

Another significant factor is infrastructure. It comprises charging capability, which means having enough charging stations allocated around the country as well as energy storage units, energy supply and distribution companies, billing service providers, politics of land use, not to mention qualified maintenance services. Infrastructure is a crucial component so that EVs can reach higher levels of market share.

However, the most significant factor for this technological transition may be the cultural issue. It is necessary to clear up doubts and uncertainties, tear down myths surrounding e-mobility and promote understanding of why adhering to a new technology for transportation.

The transition to e-mobility is expected to be a gradual process: more optimistic countries forecast transitioning their fleets at the rate of 10% a year.

In Brazil, whose fleet today is composed of nearly 3,000 EVs (only 0.02% of its national fleet), the projection is 100,000 registered EVs by 2025. However, the main trend in e-mobility

2018

august



E-mobility workshop for journalists

september



German-Brazilian Innovation Congress

november



ANEEL's mission along Brazil's Southern Charging Corridor



EV myths

THE BLACKOUT MYTH Some people believe that EVs would overload Brazil's power grid, possibly leading to blackouts. According to Itaipu Binacional, if the country decides to use all its production capacity to introduce EVs on the market, which would account for about 3.4 million new vehicles per year, the impact of such would be 3.3%.

FLOOD SHOCK-HAZARD MYTH EV batteries are designed for hazardous situations. Internal devices, connectors and battery packs are very well isolated, preventing water from reaching those parts. In addition, there is an emergency connection responsible for deactivating the battery in case of malfunction, avoiding shock hazards. Hence, EVs are safe and you won't get an electric shock.

THE HIGH MAINTENANCE COST MYTH Today, the technology used to produce EV battery packs still has a great impact on its final price, however, its maintenance cost is actually 35% lower than that of traditional cars. EVs have less moving parts, which means less maintenance, not to mention that its battery estimated lifetime is 10 years.

THE INSUFFICIENT RANGE MYTH The average driving range of EVs has been increasing. Research shows that, in urban areas, more than 80% of the population travels at a maximum rate of 64 km/day, that is, EV models currently available on the market meet the range requirements for users' daily trips.





2018

2019

november



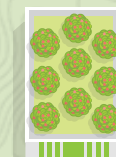
1st Conference on Intelligent Vehicles • INMETRO, where the 1st Workshop on Rules and Regulations for Mobility was held



december



Projections and analysis of demand for e-bikes in Brazil were made • Aliança Bike



for the transportation of people when considering opportunities and barriers of the national scenario is its use in public transportation. In this way, e-mobility can be applied to the context of municipalities and make efficient and smart cities a reality.

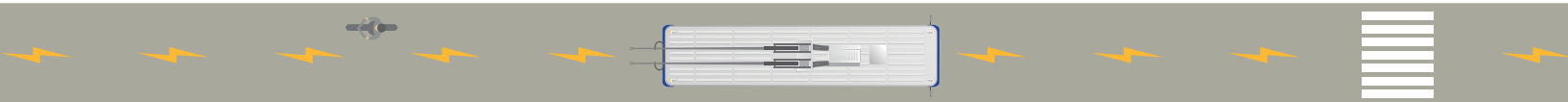
Another trend is for fleet management companies to start using EVs so as to operate in a more efficient manner and contribute to the commitments to combat global warming.

The use of individual vehicles such as cars, motorcycles, scooters and e-bikes tends to follow a growing trend around the world. Driven by the global health crisis resulting from the COVID-19 pandemic, the sales of e-bikes increased in large cities, as an alternative to the use of conventional public transportation.

E-mobility in Brazil is a prospective theme and as such it requires the structuring of a firm network of actors interested in the subject - government, industry, financing institutions, civil society and academia - articulated to create favorable conditions and make e-mobility a reality, contributing for the country to become an important hotspot in the sector.



In Brazil, 7 states offer Auto-motor Vehicles Property Tax (IPVA) exemption for electric and hybrid vehicles: Piauí, Maranhão, Ceará, Sergipe, Rio Grande do Sul, Rio Grande do Norte and Pernambuco. In addition to them, in São Paulo, Rio de Janeiro and Mato Grosso do Sul, consumers have a 50% discount on said tax.



february



Climate and air pollutant emissions benefits of bus technology options in São Paulo • ICCT



april



Impacts of Bike and E-scooter Sharing Systems, a trilogy



may



2nd workshop on rules and regulations for e-mobility was held



The German post DHL and the Brazilian post Correios pioneering roles: e-mobility in urban logistics

E-mobility applied to the urban logistics sector has shown very positive results and effects on economic production and the decarbonization of the sector. Let's meet two inspiring experiences.

German company DHL is the world's leading logistics company. It operates in more than 220 countries and territories, it runs a fleet of 92,000 vehicles, employs around 550,000 workers and has an annual revenue of € 61 billion.

In 2005, the company made a strategic decision towards more sustainable delivery systems and set a goal of achieving a zero emissions logistics process by 2050. DHL has identified EVs as an important path to reach such goals. At that time, there was no mass production of EVs that met the company's expectations.

In partnership with the RWTH Aachen University, DHL structured an incubation program, where StreetScooter GmbH was born, which was later bought by DHL and which now manufactures EVs in three different plants in Europe. Currently, e-scooters represent

2019

may



Transformative Urban Mobility Initiative (TUMI)



Technical visit • perspectives on urban e-mobility

june



Technological roadmap for light-duty EVs in Brazil report was published

july



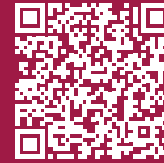
ANEEL launched Call n. 22/2018 for Strategic R&D on e-Mobility

- Promoting Efficient E-Mobility Solutions

almost 40% of the company's fleet and the goal is to reach 70% by 2025.

Correios in Brazil likewise began a study on the use of e-bikes for cargo transportation. Tests were carried out with two models of bikes in the municipality of Praia Grande as well as meetings with the strategy and operations teams of Correios. The pilot test study concluded, among other things, that it is possible to replace 48% of the motorcycle fleet used by the company with e-bikes, which can account for 84% of its total fleet if a more than 50 km range model is adopted.

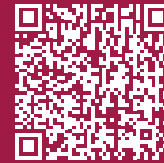
Cargo e-bikes represent a possible and viable alternative for promoting more sustainable and economically more attractive standards for the delivery services of Correios do Brasil. They also produce less pollution, reduce the risk of traffic accidents (their social security costs and number of hospitalizations in the public system are lower) and promote the physical and mental well-being and health of postal workers.



To learn more about DHL's experience, access the case study developed by LabMob/UFRJ in partnership with PROMOB-e



To learn more about the Correios' experience



Access the study carried out by PROMOB-e on markets and use of e-scooters in postal delivery

august



Mapping of effective locations for EV charging stations in Brazil



Perspectives on e-mobility in Brazil Conference



3rd workshop on rules and regulations for e-mobility was held



The Brazil-Germany joint-action to boost e-mobility in Brazil: why does this partnership work?

Brazil and Germany have been partners for over 50 years. Together, they work in Technical Cooperation for Sustainable Development, joining efforts for people, prosperity, peace and the planet. In 2015 the two countries made a commitment for the complete decarbonization of the global economy throughout the 21st century, acting in partnership to combat global warming.

Energy efficiency and renewable energies, as well as sustainable use of the tropical forest, are the main themes of this cooperation, which also aims at sustainable urban development and financing pro climate projects.

Brazil is a precursor in Latin America when it comes to clean energy and has historically been one of the great global automaker leaders. Germany, similarly, is famous for its tradition in automotive research and advances and has made important technological and regulatory achievements in the auto and e-mobility sectors.

This cooperation between Brazil and Germany for e-mobility took place in an opportune scenario for innovations, in which both countries committed themselves to the Paris Agreement, with the purpose of accelerating the decarbonization process, acting directly in one of the most relevant sectors to slow down global warming and with the possibility of using important assets from their national contexts.

It was then created the Energy Efficient Propulsion Systems project - PROMOB-e.

2019

september



Workshops to design the structure of PNME

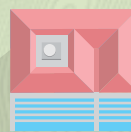


14th Latin American Platform for Hybrid-Electric Vehicles, Components and New Technologies

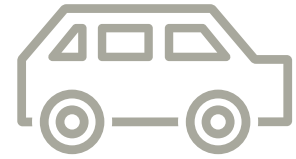
december



Report • Evaluating public transportation costs and emissions in the cities of Niterói and Belo Horizonte



It is in this context that PROMOB-e was created and operated for five years. Learn more about the purpose of this international cooperation project and the results it reached on the following pages.

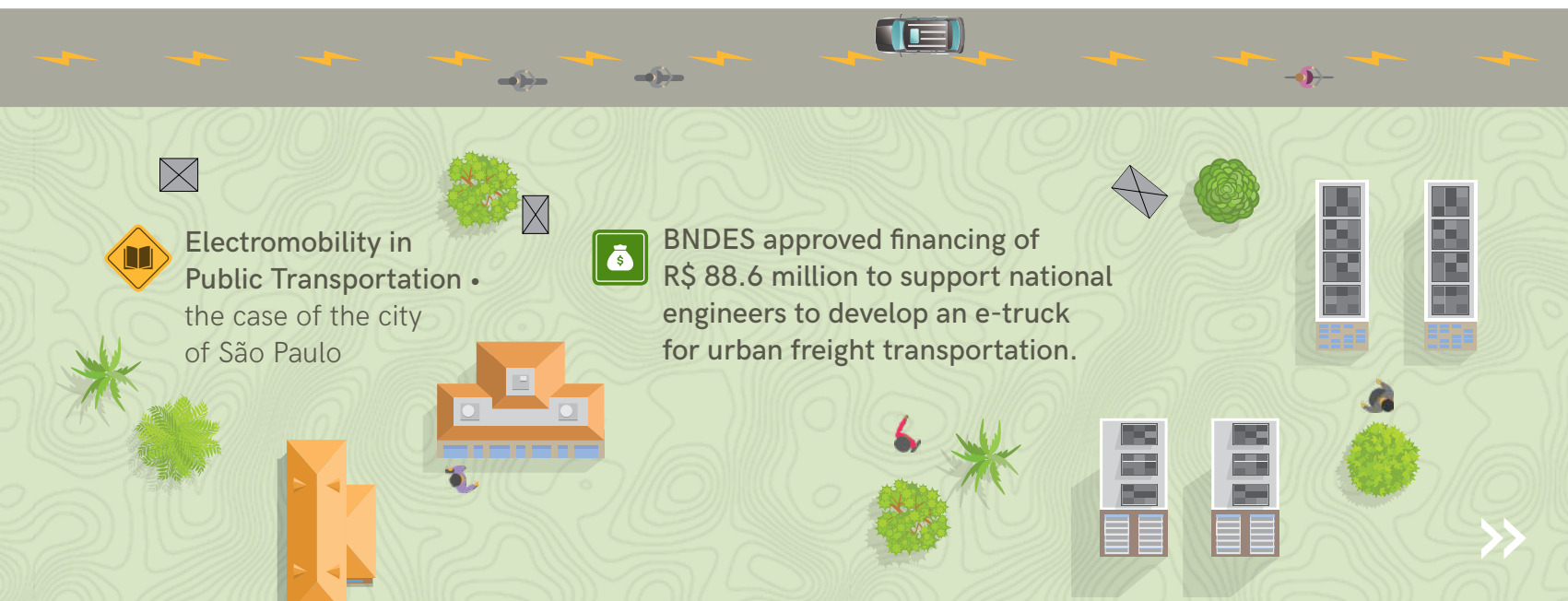


An electric motor's efficiency is 98%. A traditional internal combustion engine's efficiency is 35%. That's why we speak of an efficient propulsion system.



Promob-e has played and is still playing a key role in promoting e-mobility in Brazil. It made room for dialogue and stimulated connection and that was of great value for boosting the development of a context for mobility in various aspects, such as in the regulatory field, in public policies, in the financial aspect, in technology and in the collection of data on the sector.

Victor Andrade, LabMob/UFRJ



Electromobility in Public Transportation • the case of the city of São Paulo



BNDES approved financing of R\$ 88.6 million to support national engineers to develop an e-truck for urban freight transportation.



PROMOB-e: its **intervention logic**

PROMOB-E WAS IMPLEMENTED with the purpose of supporting Brazil in reducing emissions of greenhouse gases (GHG). PROMOB-e is a technical cooperation project implemented by the Brazilian Ministry of Economy (ME) and the Ministry of Regional Development (MRD) in cooperation with the *Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH*.

In Brazil, the transportation sector is responsible for more than half of fossil fuel consumption and for almost half of the energy sector greenhouse gas emissions. To improve this scenario, PROMOB-e works in the electrification of public transportation and urban cargo transportation by contributing to the formulation and implementation of national policies aimed at the automotive sector.

PROMOB-e started in 2017, initially from the partnership between the Ministry of Development, Industry and Foreign Trade (MDIC) and the German Federal Ministry of Economic Cooperation and Development (BMZ). Later, MDIC's role was assumed by the Ministry of Economy, which became the project's main political partner.

At the beginning, the project was more focused on developing conditions for the technological issue of e-mobility. After some advances in this direction and due to the favorable environment for approaching the theme as of urban logistics, the project started to act for new possibilities of support, such as public transportation (e-buses), logistics systems (fleets and delivery services that use various modes of transportation) and ultra light-duty vehicles (e-mopeds, bikes and scooters).


2020

february

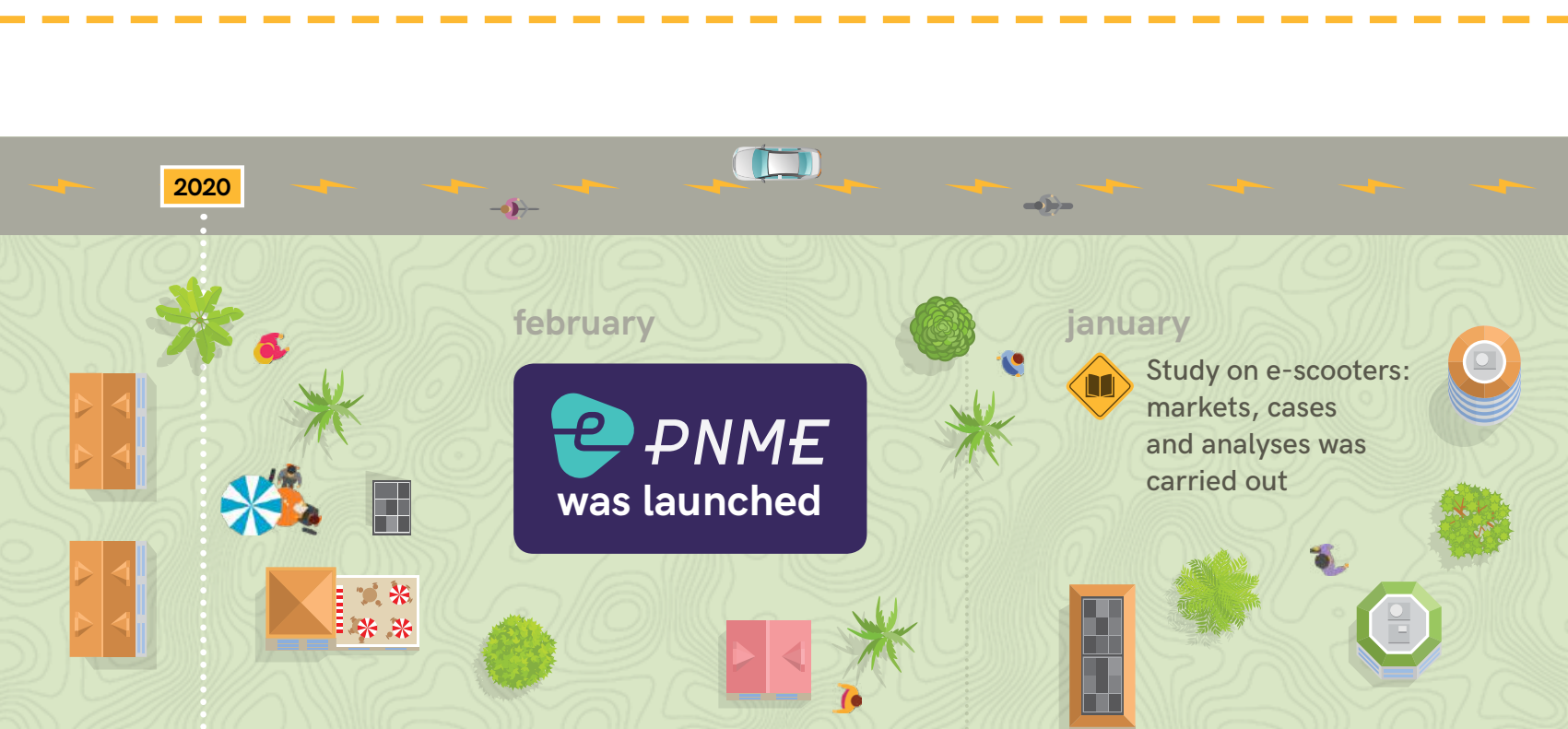


PNME
was launched

january



Study on e-scooters: markets, cases and analyses was carried out



PROMOB-e worked directly for the consolidation of e-mobility in Brazil on three areas of intervention:

Developing public policy and strategies to promote energy efficient propulsion systems

Articulating proposals for norms and regulations applicable to e-mobility in Brazil

Developing and spearheading business models and pilot projects of efficient propulsion systems

PROMOB-e also promoted cooperation with the private sector, involving automakers, suppliers, energy suppliers and fleet operators. In addition to acting mainly at the national level, PROMOB-e also sought to identify potential and stimulate projects in cities and states in Brazil.

Here are some other PROMOB-e's strategic partners:

- Ministry of Science, Technology, Innovation and Communications (MCTI), responsible for investments in research and development
- Ministry of Regional Development (MDR), responsible for introducing e-mobility in the urban transportation system
- Ministry of Mines and Energy (MME) and Energy Research Office (EPE), responsible for monitoring energy demand of EVs and adding it to the national energy planning
- National Energy Agency (ANEEL), responsible for regulating and improving electricity supply in the country
- Brazilian Development Bank (BNDES), which finances the ecosystem of e-mobility
- Brazilian Agency for Industrial Development (ABDI), which makes investments in the supply chain
- Brazilian Association of Technical Standards (ABNT)

march



Roadmap for EV connectivity in Brazil was published



Roadmap for heavy-duty EVs in Brazil was published



PNME Commission on Science and Technology (CST) was established



Impacts of PROMOB-e

Learn about some of PROMOB-e's main contributions to e-mobility in Brazil:

PROMOB-e contributed to the creation of the GT7, a Working Group formed to design the actions for the Route 2030 program, a strategy elaborated by the federal government for the development of the automotive sector in the country. Created by Law n. 13,755/2018, the Route 2030 program aims to expand the Brazilian automotive industry global insertion by making more competitive vehicles and auto parts. The results of said program will impact society as a whole, especially through increased energy efficiency and safety of vehicles sold in the country.

E-mobility technology features an accelerated learning curve and rapid cost reduction.



2020

april



PNME Working Group on electrification of public transportation was created



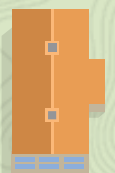
june



Steering Committee's round of proposals for projects on PNME's framework structure



Report • Testing e-bike models for the Correios • Praia Grande (SP)





PROMOB-e worked for the development of the electromobility policy in the country. The subject was taken to high levels of discussion and resulted in more skilled and experienced technical teams that deal with public policy."

Ricardo Debiazi Zomer
Ministério da Economia

ANEEL passed the first regulation on EV re-charging in June 2018, which allows the implementation and offer of commercial re-charge service not only by energy suppliers, but by any company which is interested.



july



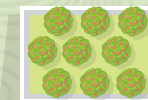
Study • Rules and Regulations for E-mobility in Brazil was carried out



august



PNME Steering Committee started drawing up a proposal for the The National Action Plan for Electric Mobility

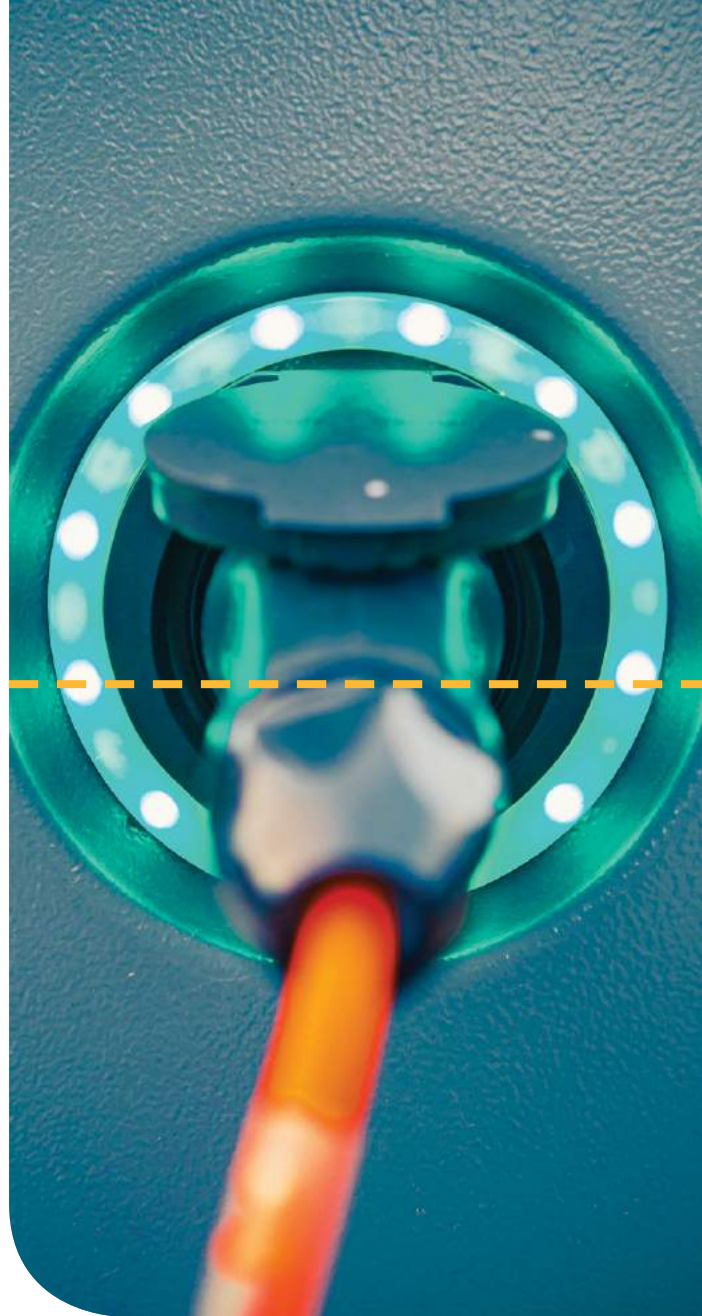


The Strategic Partnership signed between ANEEL and PROMOB-e set the initial steps for structuring the Network of Innovation in the Electric Sector - RISE - applied to e-mobility. RISE aims at fostering networking between applied research projects and the development of products and services to be offered in the market.

RISE resulted in the opening of the Public Consultation n. 22/2018 on the Call for Strategic R&D on Electric Mobility, with the theme "Promoting Efficient E-Mobility Solutions".

“ PROMOB-e is such a unique organization. It exerted a major impact by laying the foundations and connections to push forward the e-mobility agenda. With its cross-cutting agenda and excellent coordination it was able to invest resources in very relevant development areas.”

Edgar Barassa, researcher and member of the Laboratory of Electric Vehicle (LEVE/ UNICAMP)



2020



october

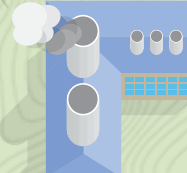


PNME
webinar series

november



PNME
Conference



"It is very important to have programs that stimulate the exchange of experiences and that share real cases because those have the ultimate power of raising awareness and promoting replication. Real cases help transitions to move forward. When it comes to cooperation between governments, PROMOB-e was the first to encourage case studies and replicability."



Cristina Albuquerque, WRI

Launched in May 2018, the R&D Call 22 provided a spur for e-mobility, which included 30 approved projects by September of the same year that account for more than R\$ 463 million (approximately €104 million) in investments in e-mobility.

The Ministry of Regional Development (MDR) is studying specific criteria for e-buses as part of the Urban Public Transportation Fleet Renewal Program (Refrota).

In September 2019, the São Paulo transportation authority (SPTrans) issued bids for the operation of approximately 14,000 urban buses. That set ambitious targets to reduce greenhouse gas, NO_x and particulate matter emissions for the 2028 to

2038 period. To achieve such goals, public bus operators will employ low-emission technologies, including e-buses, in the coming years.

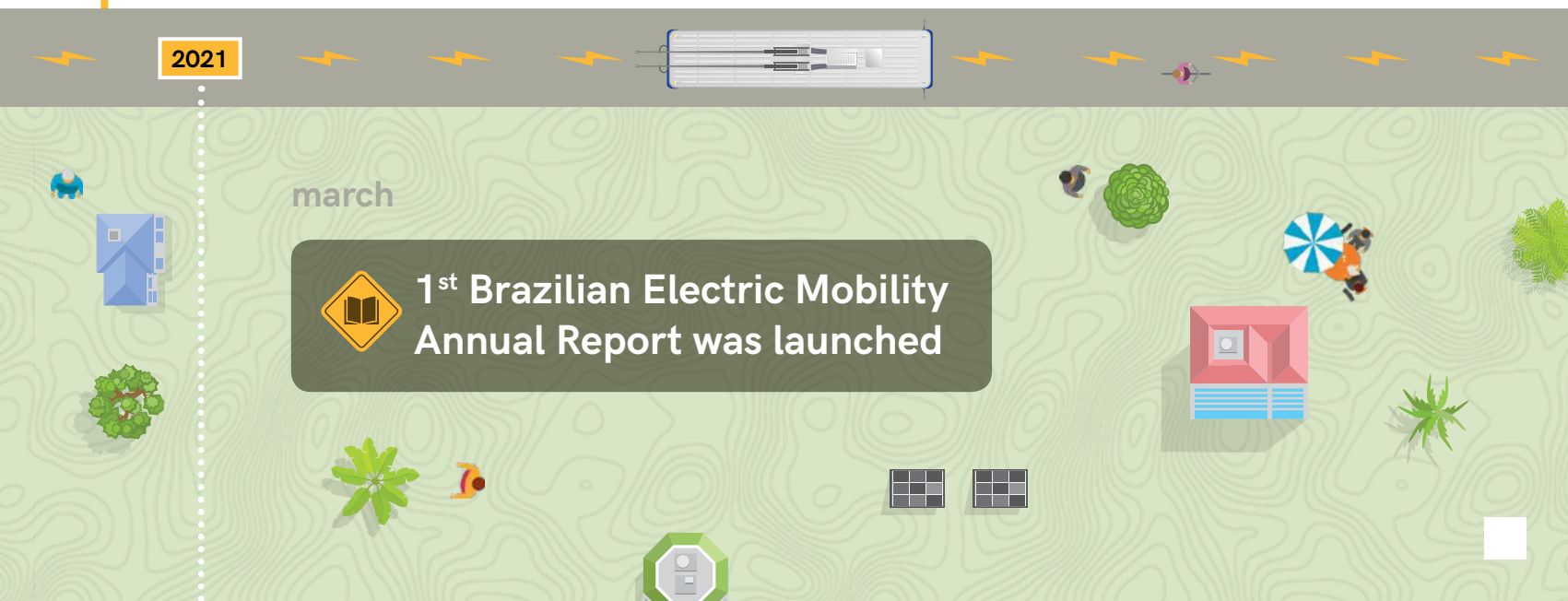
The Brazilian Association of Technical Standards (ABNT) developed a project on the classification of light vehicles (including e-bikes, e-mopeds and new EVs such as scooters and unicycles) which is awaiting approval for publication. ABNT has also participated in discussions on the new ISO 4210-10, Cycles (Safety requirements for bicycles - Part 10: Safety requirements for electrically power assisted cycles (EPACs), so as to create a national standard for e-bikes. ●

2021

march



1st Brazilian Electric Mobility Annual Report was launched



Highlights of PROMOB-e's activities



4

years of
operation



30+

publications on
e-mobility were
produced



3

technical visits
to Germany



60

Participation
in events in the
sector



Five years ago, e-mobility was a very distant topic and a technology exclusive to the future. Today we can say that it is much more of the present than the future and – we can actually see e-buses materialize more consistently in cities. It is still not very short term, but it is no longer unattainable and may be more accessible in the coming years. The technical groups, the participation of relevant actors in the sector and the interaction through technical visits were all very important for the scenario we have now.”

Rodrigo Tortoriello, National Forum of Secretaries and Directors of Urban Mobility



Perspectives on e-mobility in Brazil Conference • 2019



- **Technical visit – perspectives on urban e-mobility • 2019**
- **Transformative Urban Mobility Initiative (TUMI) • 2019**
- **Workshops on rules and regulations for e-mobility • 2019**
- **German-Brazilian Innovation Congress • 2018**



E-mobility workshop for journalists • 2018

- **Technical visit – Network of Innovation in the Electric Sector (RISE) • 2018**
- **Seminar Envisaging e-mobility in Brazil – a look at the different technological routes • 2018**

EVENTS

Over its four years of operation, PROMOB-e has always been active when it comes to cooperation and collaboration regarding e-mobility. The Project promoted and was present in more than 60 important events in the sector.



The National Platform for Electric Mobility (PNME) launch • 2020

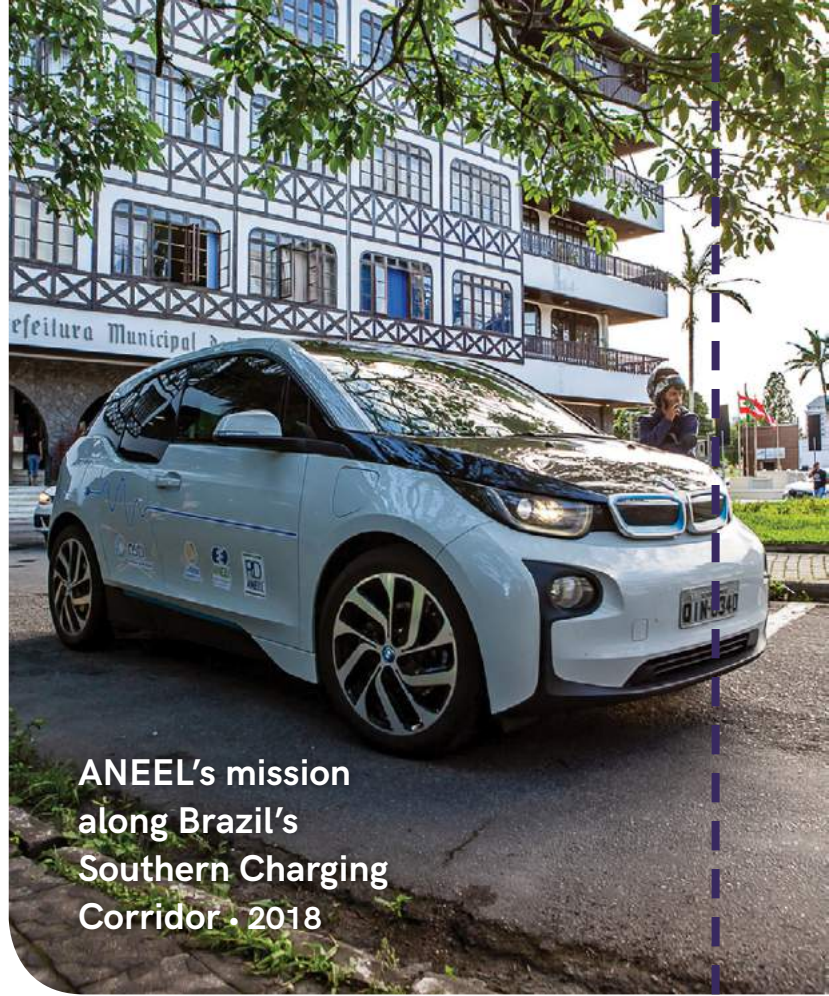


Financing e-mobility in public transportation workshop, held by PROMOB-e • 2019



Brazil-Germany E-mobility Forum • september 2017

- **E-mob International Seminar: E-mobility applied to public city buses • 2018**
- **Technical visits to Germany - aimed at regulations, public policies and technology • 2017**



ANEEL's mission along Brazil's Southern Charging Corridor • 2018



Network of Innovation in the Electric Sector (RISE) as an influencer to e-mobility in Brazil • 2019

"It is essential to memory-keep what is being produced in e-mobility in the country nowadays."



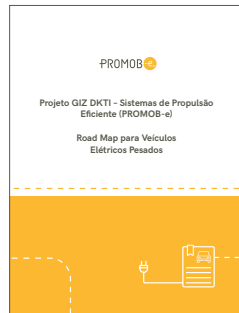
Adalberto Maluf, ABVE

STUDIES AND PUBLICATIONS

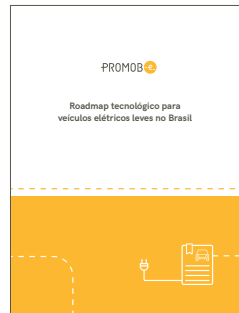
In order to promote knowledge production and contribute to increasing the technical capacity in the e-mobility ecosystem, PROMOB-e carried out and supported more than 30 studies and publications. An important part of this process was to encourage closer ties among actors in the sector and academia, welcoming research institutes to discuss the topic.



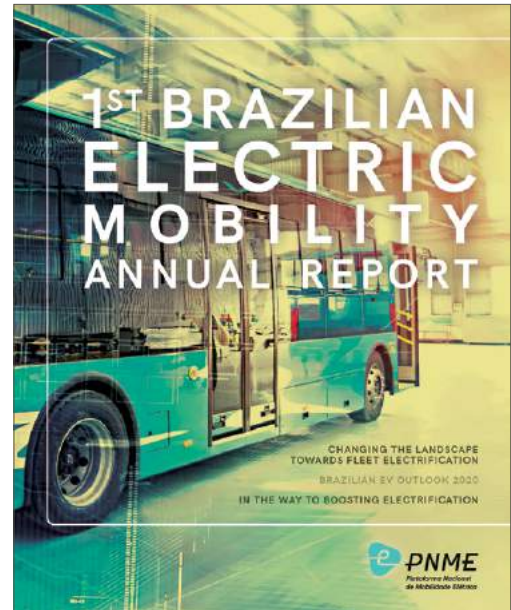
Roadmap for EV connectivity in Brazil



Roadmap for heavy-duty EVs in Brazil



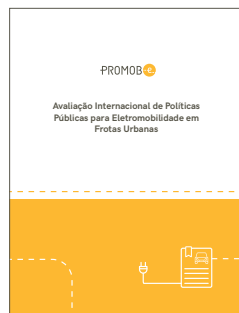
Roadmap for light-duty EVs in Brazil



1st Brazilian Electric Mobility Annual Report



Rules and regulations for e-mobility in Brazil



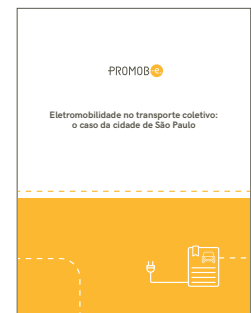
International evaluation of public policies for e-mobility in urban fleets



Systematizing e-mobility initiatives in Brazil



Report - Evaluating public transportation costs and emissions in the cities of Niterói and BH



Electromobility in public transportation: the case of the city of São Paulo



PRESENCE AND VISIBILITY





Promob-e's greatest contribution to e-mobility was its ability to generate dialogue, which began in the mapping of actors. In government agencies, the Project identified entities related to the theme or those which had experience in the field, then it identified its professionals and functions linked to the subject and promoted dialogue and articulation among them. And all of this in collaboration with other important actors of the sector."

Anie Amicci, BNDES



Synergy with other Brazilian-German Cooperation projects for Sustainable Development

PROMOB-e was established within the context of cooperation on energy efficiency and renewable energies. The project operates at the national level, especially with regard to public policies, regulation and technology, and at the subnational level, it addresses themes of urban mobility and smart cities. Learn more about other technical cooperation projects in synergy with PROMOB-e.

FELICITY *Financing Energy*

for Low-Carbon Investment - Cities Advisory Facility (FELICITY) project supports the implementation of strategies to reduce greenhouse gas (GHG) emissions in cities and municipalities and works on measures to promote energy efficiency and integration of renewable energy sources in the sectors of energy, water, transportation, waste and construction. The project also aims to support municipalities to develop and implement projects qualified for international financing.



ANDUS Support for the National Agenda for Sustainable Urban Development in Brazil project aims to support the implementation of coordinated and articulated strategies for sustainable urban development, including strategies for mitigation and adaptation to climate change, in the federal, state, and municipal levels.



ENERGY EFFICIENCY IN URBAN MOBILITY (EEMU)

The project worked with the objective of improving the framework conditions that enable better energy efficiency in the urban mobility sector, through improvements in mobility management in the municipalities. The project operated according to the national effort to reduce GHG emissions, working on three crucial dimensions for more energy-efficient urban mobility: the entire system (system efficiency), individual trips (trip efficiency), and vehicle technology (vehicle efficiency).



FUTURE ENERGY LEADERS

The project aims to encourage and support professional training programs and initiatives to meet the growing demand for skilled professionals of renewable energy and energy efficiency technologies. Through networking, the project develops the specification of requirements for professional profiles, promotes standardized training itineraries, produces teaching materials for theoretical and practical lessons, provides training for teachers and instructors and shares successful approaches among actors.





Find out more about the "E-mobility: myths or facts" game



MITO OU VERDADE?

(6/10) Se toda a frota nacional de veículos for elétrica, no Brasil, não haverá energia suficiente para todos

MITO

VERDADE



Electrification of transportation brings a series of improvements to the country by cleaning the air, taking care of the environment and creating jobs, in addition to improving mobility and inclusion in our cities"

Ilan Cuperstein, C40

The National Platform for Electric Mobility

E PROMOB-E CONTRIBUTED to matters concerning structural problems of e-mobility and produced several results, as we have seen in this publication. In addition, its performance generated positive effects for the scenario of e-mobility in Brazil.

One of the most notable positive effects was the promotion of greater articulation between actors who collaborated and were interested in e-mobility, which stimulated the creation of an ecosystem of interrelationships among those stakeholders.

As a cooperation project, Promob-e ceased its activities in 2021. However, all its intellectual capital and especially the collaboration and cooperation of actors regarding the cause are extremely important assets that were generated by

the project and it would make no sense, in face of such a favorable and opportune context for innovations, that this mobilization stagnated.

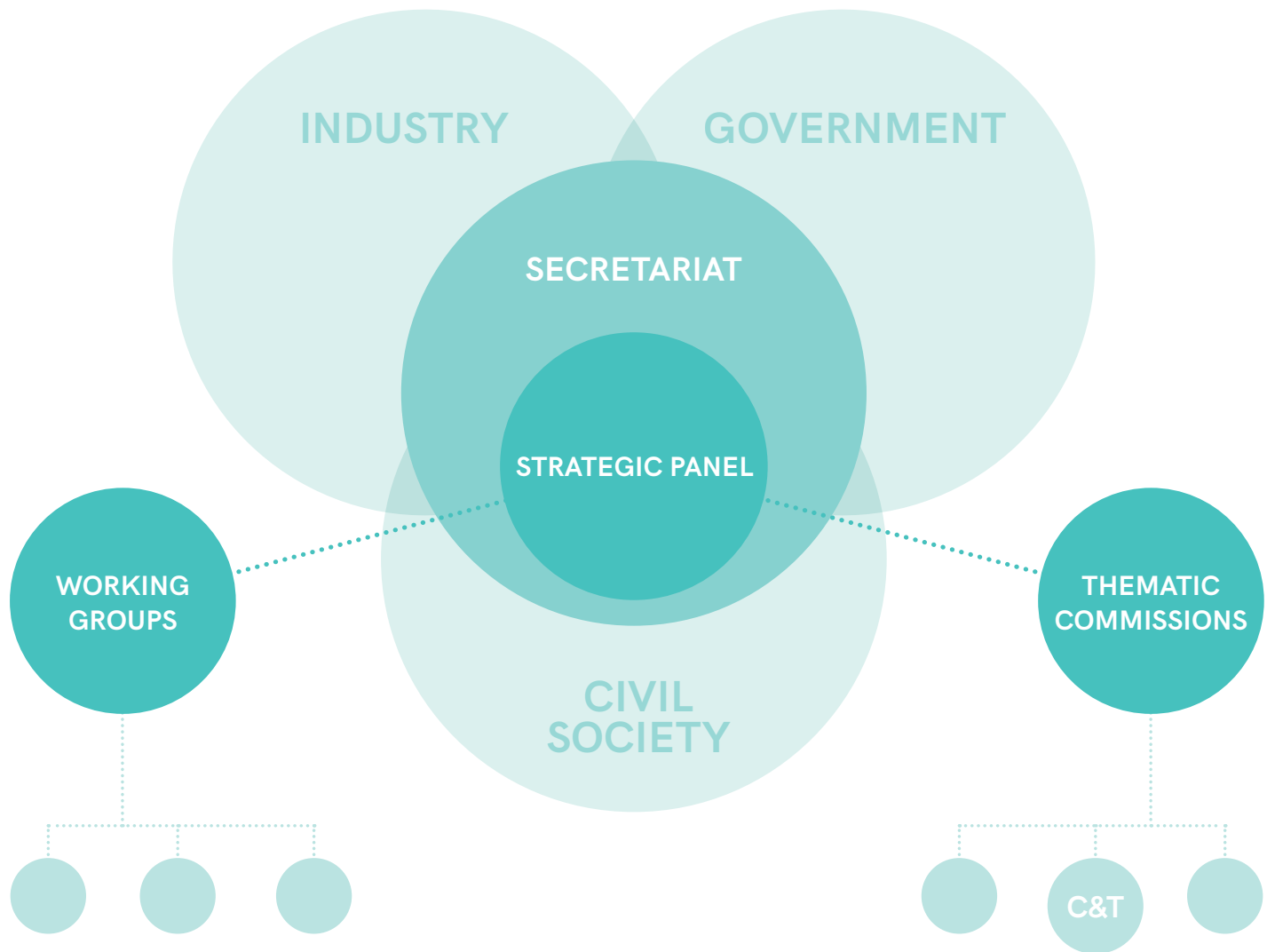
Thus, as a legacy of its activity, Promob-e has fostered the creation of the National Platform for Electric Mobility (NPEM), built on the principles of shared value creation, it also preserves the fundamental character of multi-stakeholder actions necessary to the subject of e-mobility.

The PNME encourages networking, the exchange of information and knowledge and it contributes to mechanisms for learning and training skills. This articulation allows the definition of goals for the development of technology, it subsidizes the formulation of public policies and regulations, it also fosters Research & Development (R&D) and contributes to the effective adoption of e-mobility.



The PNME is a spectacular legacy from Promob-e. It has already been built so that it has a life of its own and maintains its independence. The Platform deals with several themes and works with the clear objective of implementing e-mobility in Brazil. It was created with a very interesting arrangement, with the presence of actors from S&T, industry, cities, EV associations, mobility-aware user associations, associations of public transportation, in addition to the participation of the federal government and the interlocution with municipal secretaries of transportation.”

Fernando Araldi, Ministry of Regional Development (MDR)



The Platform brings together more than 30 institutions under the leadership and strategic planning of a Steering Committee, formed by a group of institutions including government agencies, organizations, industry and civil society under a governance framework structure that fosters cohesion, neutrality, independence for actors to work on their individual agendas at the same time that they work on a common agenda for e-mobility.

In its first year of activities, PNME worked on institutional activities, capacity building, research

and development, communication and market development actions, such as:

- Projects
- The National Action Plan for Electric Mobility
- Arguments in favor of e-mobility
- 1st Brazilian Electric Mobility Annual Report
- National System for Electric Mobility
- 1st PNME Conference

Learn more about PNME www.pnme.net.br ●



“

Brazil and Germany develop joint innovative solutions to the global challenges of climate change and urban transformation. E-mobility helps to reduce greenhouse gas emissions, air pollutant emissions and noise emissions, thus improving the quality of life in urban centers. Modern e-buses and new electric micro-mobility services (e-bikes, e-scooters) also increase the attractiveness and use of these more sustainable modes of transportation. Such technological changes have the potential to induce a profound change in the urban mobility system. They are catalysts for integrated planning, which results in shorter travels and brings urban services (housing, education, work, health, etc.) closer to people. The theme of e-mobility connects new partners and actors with urban transformation and expands the movement towards more inclusive and sustainable cities.”

Sarah Habersack

Urban Transformation Coordinator, GIZ Brazil



Learn more

"E-mobility in Brazil" was published by Projeto Sistemas de Propulsão Eficiente - PROMOB-e (Energy Efficient Propulsion Systems), a bilateral technical cooperation project between the Secretariat for Development of Industry, Commerce, Services and Innovation - SDIC and the *Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) GmbH*.



Access more than 30 studies and publications carried out by PROMOB-e



Access the series of videos on E-mobility produced by PROMOB-e



Access PROMOB-e website



Find out more about the Transformative Urban Mobility Initiative - TUMI Volt



Ministry of Economy • SDIC



GIZ



YouTube GIZ Brazil





PUBLISHED BY

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