HOW
ENERGISA GROUP
HAS BEEN ADDRESSING
THE CHALLENGES OF
DECARBONIZATION
AND **UNIVERSAL**
ENERGY ACCESS
IN THE REGION

GRUPO energisa

abril.2023

This report presents an overview of how Energisa Group has been cooperating with MME and ANEEL in addressing two significant challenges that significantly impact the vast territory of the Legal Amazon: decarbonization and **universal** energy access.

It focuses on the initiatives we have been conducting in the region over the last five years, in the four states where our electric utilities operate: Acre, Mato Grosso, Rondônia and Tocantins.

These are projects where we leverage the expertise accumulated over our 118-year journey across Brazil to bring continuous, clean and **renewable** energy to communities and customers living in isolated regions of this vast and rich country.

With solutions boasting **state-of-the-art technology, minimal environmental impact and high durability,** we have risen to the challenge of overcoming the high complexity of carrying out projects in the region, contributing to sustainable development and the quality of life of these communities.

Based on technical data, videos and testimonials, this book shares **our successful experience in implementing public policies and contributing to designing solutions that spearhead a fair and efficient energy transition.**

We also demonstrate how our **commitment to decarbonizing** our operations has had ripple effects throughout the system.

I hope you enjoy the report.

Ricardo Botelho
Energisa Group CEO

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OVERVIEW

LEGAL AMAZON

When we think about the Amazon, the first things that come to mind are its boundless forests and rivers, ubiquitous wildlife, and the diverse cultural and social heritage of indigenous and maroon communities.

Looking through the lens of **the escalating climate emergency and the need to decarbonize the economy**, the Amazon's contribution to regulating the planet's climate becomes even clearer.

In terms of the **need for sustainable social and economic development in the region**, there is an enormous challenge of building infrastructure that allows this reality to reach the communities and residents of isolated areas.

The challenges of **decarbonization and universal energy access** are issues we will delve into further below.

9 states
Acre, Amapá, Amazonas, Maranhão, Mato Grosso, Pará, Rondônia, Roraima and Tocantins

808 municipalities
14.5% of municipalities in Brazil

5.1 million km² area
60% of Brazil's landmass

29.6 million inhabitants
14% of Brazilians

3.7 million km² of natural coverage
80% of what we have in the country

GDP of R$ 764 bn
11.4% of Brazil's GDP

*Source: Legal Amazon data https://amazonialegalemdados.info/home/home.php

ACCESS TO ENERGY AND REGIONAL DEVELOPMENT OF THE LEGAL AMAZON

Municipalities powered by Islanded Systems (SISOL) or precarious ones, therefore not connected to the National Grid, fare **worse in various socioeconomic indicators**, compared with grid-connected municipalities in their region and state. (IEMA)

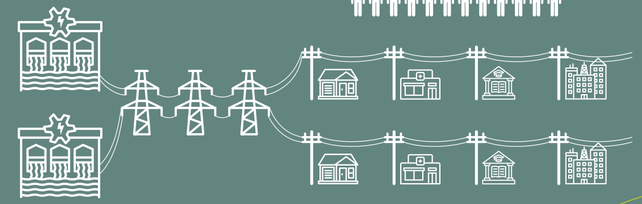
The quality of energy provided by thermoelectric plants is inferior, more unstable and subject to more outages, due to the long distances the diesel has to travel. As a result, they **do not meet companies' power needs or let** them carry out productive activities that rely on a reliable energy supply. They are also polluting due to the use of fossil fuels.

CONSUMERS CONNECTED TO THE NATIONAL GRID (SIN)

Hydropower plant

Plants around Brazil connected to the National Grid (SIN)

24 million



CONSUMERS CONNECTED TO ISLANDED SYSTEMS

Diesel-fired thermal power plant

Local plants that only serve the islanded system

3 million

PEOPLE WITHOUT ACCESS TO ELECTRICITY

Diesel generator

Consumers travel to buy diesel or receive it through rivers

1 million

LARGE ENVIRONMENTAL FOOTPRINT
Energy consumption in the Islanded Systems represents 0.6% of Brazil's total, but generates the equivalent of **10% of GHGs emitted** by the entire National Grid (not counting the transportation of diesel over long distances).

LARGE ECONOMIC IMPACT
The Islanded Systems also pressure CCC: Over 25 years, the cost is estimated at **R$ 2.3BN**. With solar energy, it would be **R$ 4.4MN**.

*Source: climate policy initiative

*Source: CPI/PUC-Rio based on data from EPE, IBGE, and IEMA, 2022

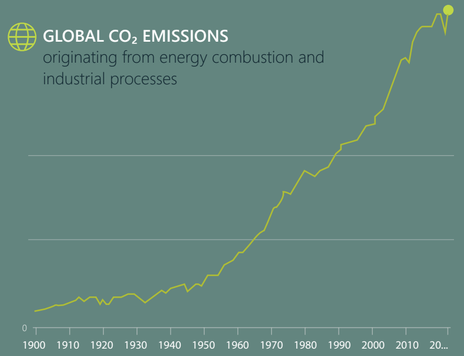
OVERVIEW

DECARBONIZATION CHALLENGE
THE POWER SECTOR

THE PATHWAY FOR THE ELECTRICITY SECTOR TO ACHIEVE ZERO EMISSIONS BY 2050 IS NARROWING.

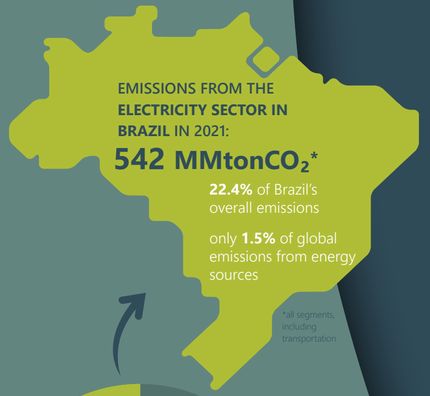
Decarbonizing the economy is deemed the only way to face the climate crisis and its effects, putting the world on a path that limits global warming to 1.5 °C by 2100.

GLOBAL CO_2 EMISSIONS
originating from energy combustion and industrial processes



*Source: iea.org

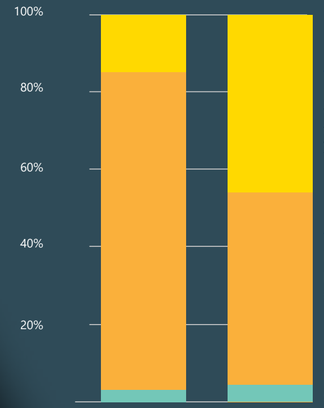
+0.9% or 321 MT
2021 vs 2022



GLOBAL ENERGY SECTOR HOLDS THE KEY
to reversing the worst effects of climate change, probably the biggest challenge humanity has ever faced.

ZERO EMISSIONS BY 2050

Requires major leaps in clean energy innovation



CO_2 EMISSIONS AVOIDED VERSUS 2020

TECHNOLOGIES IN DEVELOPMENT
Widespread use of technologies that are not yet available.

TECHNOLOGIES ON THE MARKET
Rapid deployment of available technologies.

BEHAVIORAL CHANGES
Complete transformation of how we produce, transport and consume energy.

IN THE AMAZON REGION

Driving down GHG emissions generated by productive activities is crucial.

Here, both the potential for revenue and the environmental and social benefits involved are taken into account:

. mitigation of climate change effects

. forest conservation and rehabilitation and the diversity of life therein

. job creation

. access to new markets

. better living conditions in local communities.

The potential for using renewable energies in the region is enormous. Opportunities involve using hybrid solar/battery systems, replacing fossil fuels with biofuels, tapping energy from small waterfalls, producing biogas from organic waste and sanitary landfills, among others.

FACING THE CURRENT CHALLENGES, WE HAVE THE OPPORTUNITY TO INTRODUCE NEW WAYS OF PRODUCING AND ENGAGING WITH ENERGY, PUTTING THE AMAZON REGION ON THE ENERGY TRANSITION MAP.

OVERVIEW

THE CHALLENGE OF UNIVERSAL ENERGY ACCESS IN THE LEGAL AMAZON

ENERGY AS A DRIVER OF SUSTAINABLE SOCIAL AND ECONOMIC DEVELOPMENT

The region is the largest provider of hydroelectric power to the rest of the country, but faces the challenge of providing energy to the population living in isolated areas:

99% of people without energy access in Brazil live in the region*

251 locations in Brazil not connected to the National Grid: almost all are in the region*

*Source: Iema

The **LIGHT FOR ALL** program has brought electricity to 16 million people since 2003, but it **has struggled to connect residents in remote regions of the Legal Amazon to the National Grid** due to the great distances from consumer centers, logistical difficulties and high installation costs.

Launched in 2020, the **MORE LIGHT FOR THE AMAZON PROGRAM (MLpA)** aims to accelerate **universal energy access in remote communities with renewable energy**, which is more economically and environmentally sustainable.

WHO WILL BENEFIT

Low-income families, with priority for **indigenous and maroon communities, as well as rural settlements and forest reserves**, located far from conventional electric power grids.

ACCESS TO ENERGY: LIMITED, POLLUTING AND COSTLY

Many residents have never had access to any type of energy. Others use precarious and makeshift systems, maintained by their own communities, municipalities or local leaders, mainly diesel generators, which are highly polluting and incur high maintenance costs on parts and fuel, which is transported over long distances. **When there is no diesel, there is no energy.**

WITHOUT ACCESS TO CONTINUOUS ENERGY, RESIDENTS LIVE WITH VARIOUS LIMITATIONS

The high cost of diesel-generated energy presents serious obstacles to the region's economic and social development. A few examples are:

EDUCATION
without the Internet, educational possibilities diminish, affecting research, homework and even the difficulty of studying after sundown under the dim glow of a lamp.

HEALTH
hospitals are hours away by boat for most residents. Without light, health clinics cannot count on serums and vaccines nor perform basic procedures that could save lives.

R$ 400 per month
Is the approximate cost to keep a diesel generator running about 3h/day. Replacement parts are also expensive.

NUTRITION
without the possibility of refrigeration or freezing, many foods go off or cannot be consumed as intended, affecting the residents' nutrition.

PRODUCTION AND INCOME
the impossibility of using motorized machinery and preserving food increases the physical demand for domestic and productive work, in addition to restricting the types of economic activities that can be carried out. Not being able to work at night also has impacts.

COMFORT
experiences that urban dwellers take for granted, such as drinking cold water, cooling off with a fan or watching television, are not available to these people.

GRUPO energisa

HOW WE ARE HELPING ADDRESS THE CHALLENGES OF **DECARBONIZATION** AND **UNIVERSAL ENERGY ACCESS** IN THE REGION

LEARN ABOUT OUR INITIATIVES IN THE REGION

Throughout our 118-year journey working to bring energy to Brazil, we have made the **responsibility of promoting sustainable development part of our business strategy.**

In 2022, we unveiled our **ESG Agenda**, structured around 5 pillars: Energy Transition, Sustainable Solutions, Impact Mitigation, Equal Opportunities, and Regional Appreciation. Among our commitments, we pledged to achieve carbon-neutrality by 2050.

Within the **Energy transition** pillar, in partnership with the Ministry of Mines and Energy and ANEEL, we are addressing two key challenges for the development of the Legal Amazon: decarbonization and universal energy access for the residents of the states in which we operate.

On the **decarbonization** front, we are implementing one of the leading decarbonization programs in the country in the sector, turning off diesel power plants and connecting locations to the National Grid.

On the **universal energy access** front, in partnership with the More Light for the Amazon Program (MLpA), we are bringing renewable and quality energy to residents of hard-to-reach areas, replacing diesel generators with highly efficient **SIGFIs.**

The innovative **MIDGI** technology, which we developed in partnership with ANEEL's R&D program, is allowing the installation of sustainable hybrid generation plants, which combine solar energy and biodiesel to supply isolated communities.

Installing each of these systems is a deep dive into Brazil. With each house, school and energized health clinic, our teams live the experience of seeing more dignity, more citizenship, and new opportunities for social and economic development sprout for families that previously felt excluded.

GRUPO energisa

SPEARHEADING THE ENERGY TRANSITION, CONNECTING BUSINESSES AND PEOPLE TO THE BEST ENERGY SOLUTION

We are the largest private corporate group in the electric sector with 100% Brazilian capital.

NET REVENUE
R$ 26.5 billion

OPERATION
90% of Brazil's landmass

EMPLOYEES
16,700 direct employees

CUSTOMERS
20 million people reached with our services

FULL ECOSYSTEM OF ENERGY SOLUTIONS

Distribution

10 CONCESSIONS

862 municipalities benefited

8.4 MM customers, or 10% of the Brazilian population

2,034 km2 of coverage area: 24% of Brazil's landmass

37,520 GWh distributed energy

Centralized Generation and Transmission

12 CONCESSIONS

3,116 Km high-voltage lines

14,372 MVA installed capacity

CENTRALIZED-GENERATION SOLAR CLUSTERS

70 MWp
Rio do Peixe I
Rio do Peixe II

Renewable sources Added value services Free Market

53 DISTRIBUTED-GENERATION SOLAR CLUSTERS

188 MWp*
*211 MWp in march/23

7 ADDED-VALUE SERVICE COMPANIES

FREE MARKET

4,646 GWh marketed

2,046 energy energy purchase and sale transactions

Fintech

1MN CUSTOMERS

R$ 1BN in receivables factored for group suppliers

550,000/month Energisa light bills paid with PIX Voltz

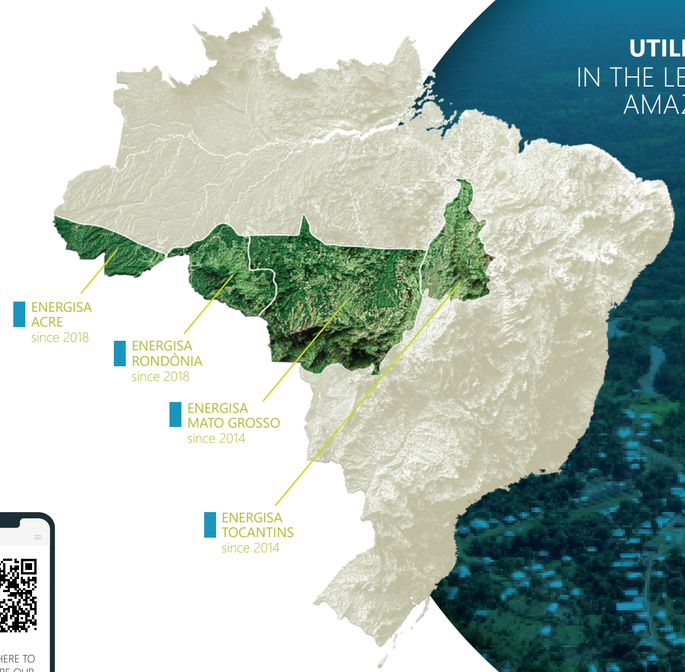
ESgás grupo energisa

Our latest acquisition, the gas distributor in Espírito Santo state, marks the Group's first investment in the fuel of the energy transition (less polluting than other fossil fuels and less subject to the oscillations of wind and solar energies).

118 years
Infinite possibilities

DATA AS OF 12/31/2022

OUR UTILITIES IN THE LEGAL AMAZON



CLICK HERE TO SEE HERE OUR INSTITUTIONAL VIDEO

ENERGISA GROUP

ESG AGENDA

PILLARS

OBJECTIVES

COMMITMENTS

1/ ENERGY TRANSITION

Enable the addition of renewable sources in Brazil sustainably, with energy security, and matrix reliability.

2026

Universal access: 55,000 new consumer units in remote areas with clean, affordable energy.

Decarbonization: reduction of 171.7 MW of thermoelectric energy by 2025.

Renewable generation 1.7 GW of installed capacity.

2/ SUSTAINABLE SOLUTIONS

Help customers in their energy transition, offering solutions aligned with the 4Ds.

2026

Emissions reduction: helping avoid the emission of at least 510,800 tons of CO_2 annually by our customers.

3/ MITIGATING IMPACTS

Mitigate the impact on Energisa's business, systemically addressing the production chain and the conscientious use of energy and water, and reducing emissions and waste.

2050

Zero emissions: achieve carbon emissions neutrality.

4/ EQUAL OPPORTUNITY

Further promote equal opportunities by democratizing knowledge and entrepreneurial education, fostering measures to create income in the areas where we have concessions.

2026

Inclusion: be perceived as an inclusive company by our employees.

Employment: promote the placement of 70% of the public trained in our continuing education programs in the communities.

5/ REGIONAL VALUE

Bring society closer, with cultural activities and the manifestation of regional values in the locations where the company is present.

2026

Creative Economy: encourage cultural production and heritage preservation in our concession areas.

Sustainable development: mobilize projects and partnerships to spur the sustainable development of Brazil's more fragile biomes.

Guarajá Mirim Substation - RO

WHAT WE ARE DOING FOR THE **DECARBONIZATION OF THE LEGAL AMAZON**

BRAZIL'S LARGEST DECARBONIZATION PROGRAM

Within our commitment to reduce GHG emissions, indirect emissions are also included, from suppliers that are part of our chain.

This is the case of **thermoelectric power plants, which supply energy to our customers in locations not served by the National Grid (SIN).**

In 2020, we assumed sector leadership with a robust decarbonization program, which replaces these highly polluting third-party plants with the infrastructure that connects these locations to the National Grid.

Building grids in an environmentally sustainable way is a crucial step in the energy transition that ensures clean and quality energy while reducing the emission of polluting gases.

MOST BENEFITED STATE

Rondônia, with 13 deactivated thermoelectric plants. 95% of the State's customers already have clean and renewable energy.

PROCESS OF DEACTIVATION AND CONNECTION WITH THE NATIONAL GRID

1/ Construction of distribution lines that connect the National Grid to communities that still rely on isolated thermoelectric plants

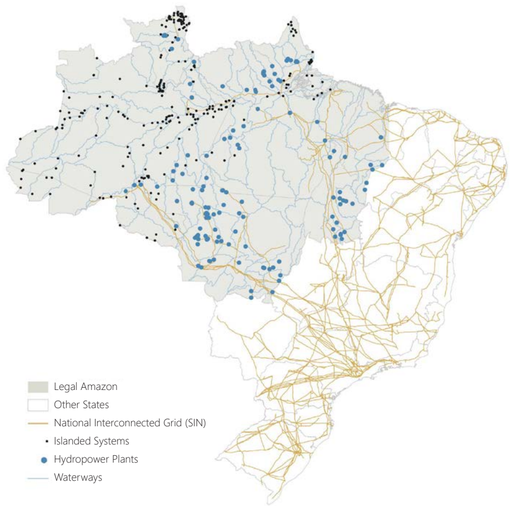
2/ Construction of the power substation, following all environmental standards

3/ Energization of the substation

4/ Gradual connection of customers to the substation (parallel operation to thermoelectric plants)

5/ Shutdown of the thermoelectric plant

MAP OF THE TRANSMISSION LINES OF THE NATIONAL INTERCONNECTED GRID, ISLANDED SYSTEMS, AND HYDROELECTRIC PLANTS OF THE LEGAL AMAZON*



*Source: CPI/PUC-Rio based on data from EPE, IBGE, and IEMA, 2022

BENEFITS OF REPLACING THERMOELECTRIC PLANTS WITH SUBSTATIONS INTEGRATED TO THE NATIONAL GRID (SIN)

LOWER ENVIRONMENTAL IMPACT

Both from diesel combustion emissions and from its transport to locations.

INCREASED ENERGY SECURITY

The National Grid harnesses various energy sources to power the system. If one of them experiences issues, another is triggered, ensuring customers have a more stable and reliable supply.

INCREASE IN SUPPLIED ENERGY QUANTITY

This allows large companies to come to the region, stimulating the local economy and its potential for income and job generation

CHEAPER ENERGY

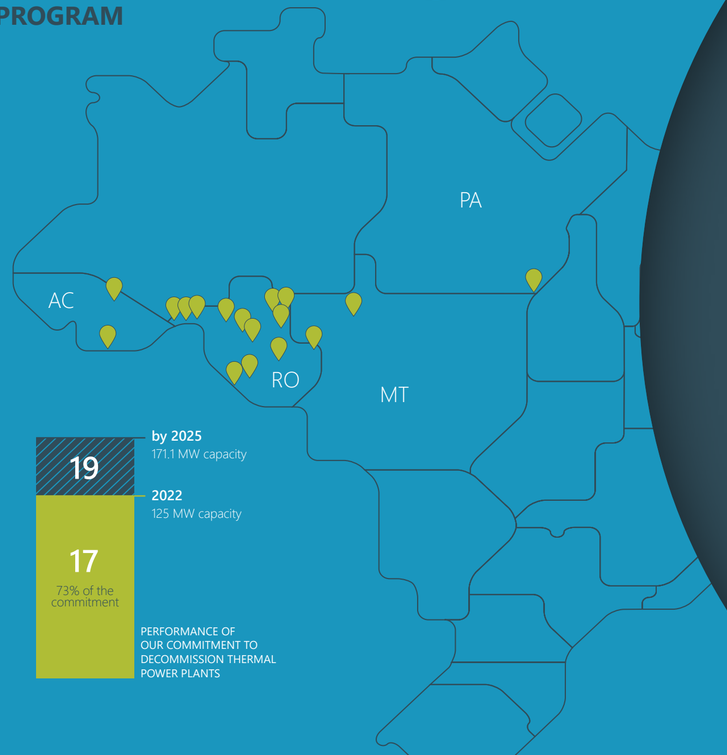
Energy generation in thermoelectric plants is more expensive than in the National Grid – due to the price of diesel and because there are no economies of scale. The difference between these costs is recorded in the Fuel Consumption Account (CCC), shared among all electricity consumers. In 2022, the CCC exceeded R$ 10 billion (EPE 2022). Without this cost, bills are cheaper for all Brazilians.

SUPPORT FOR UNIVERSAL ACCESS TO RURAL ELECTRIFICATION

Some substations serve as a base for energy to reach rural properties, improving the quality of supply to these customers.

ENERGISA

LEGAL AMAZON DECARBONIZATION PROGRAM



19 — **by 2025**
171.1 MW capacity

2022
125 MW capacity

17
73% of the commitment

PERFORMANCE OF OUR COMMITMENT TO DECOMMISSION THERMAL POWER PLANTS

DECOMMISSIONED THERMAL POWER PLANTS AND AWARDED CAPACITY

RONDÔNIA

Alvorada d'Oeste
6,740 kW

São Francisco do Guaporé
8,100 kW

Costa Marques
6,740 kW

Vale do Anari
4,840 kW

Machadinho D'Oeste
15,000 kW

Cujubim
12,000 kW

Buritis
18,000 kW

Campo Novo de Rondônia
3,520 kW

União dos Bandeirantes
6,720 kW

Vista Alegre do Abunã
9,200 kW

Extrema
4,840 kW

Nova Califórnia
4,840 kW

Espigão d'Oeste
2,200 kW

ACRE

Manoel Urbano
2,220 kW

Assis Brasil
2,200 kW

MATO GROSSO

Colniza
2,536 kW

PARÁ

Santana do Araguaia
15,990 kW

DECOMMISSIONED CAPACITY

125 MW 2020-2023

46 MW 2025

RO: 97 MW MT: 2 MW

AC: 4 MW PA: 15 MW

EMISSIONS AVOIDED

Today, with the 17 decommissioned thermal power plants, we are avoiding emissions of

352,000 tCO_2/year

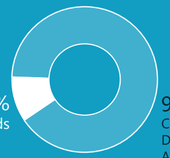
From 2025, when all thermal power plants are shut down:

507,000 tCO_2/year

3 million trees
or
reforestation of 3,500 hectares
or
5,020 football fields

TOTAL COST OF THE WORKS

R$ 1.2 bn



74 new substations

+1,000 Km of high-voltage grids integrating remote regions into the National Grid (SIN)

6,000 km of distribution grids ensuring better energy is provided to the population.

DIESEL CONSUMPTION AVOIDED

5 million liters

Cost reduction of R$ 665 MN/year

POPULATION SERVED WITH CLEANER ENERGY

400,000 people
16 municipalities

ANNUAL CCC COST REDUCTION

865.3 million

ASSIS BRASIL - AC


SANTANA DO ARAGUAIA - PA


GUARAJÁ MIRIM - RO


BOM FUTURO - RO

NEW SUBSTATIONS CONNECT 74 LOCATIONS TO THE NATIONAL GRID (SIN)


COLNIZA - MT

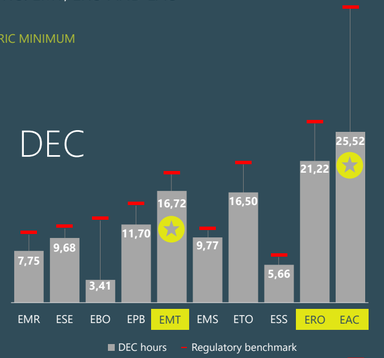

ASSIS BRASIL - AC

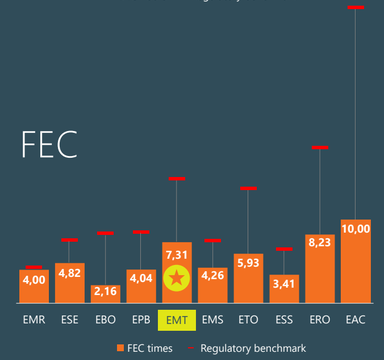

RIO MADEIRA - RO

The improvement in the quality of energy we provide can be seen in our DEC and FEC performance. All our distribution companies are operating with DEC and FEC rates well below the regulatory benchmarks.

HIGHLIGHTS: EMT, ERO AND EAC

★ HISTORIC MINIMUM





CUSTOMER TESTIMONIALS

"When we first got here, there was only a little engine that ran until 10pm. Then it would turn off and we would be without power for the rest of the night. There were times when fuel didn't arrive, so they would shut down sectors [of the town]."

Carlos Alberto, resident of Alvorada do Oeste

"This power line was a dream come true. It took a long time to arrive. Now, the quality of the energy is different. Now we can have hope for a better future, with higher quality energy."

Waldemar Góes, resident of Alvorada do Oeste

DIGNITY
CIVIC ENGAGEMENT
SUSTAINABLE DEVELOPMENT

UNIVERSAL ENERGY ACCESS
MORE LIGHT FOR THE AMAZON (MLpA)

The noise of the diesel generator marks the lives of thousands of residents of isolated locations in the region. A precarious, expensive and polluting solution to circumvent the energy isolation they live in.

WITH MORE LIGHT FOR THE AMAZON (MLpA), the MME (Ministério das Minas e Energia) intends to universalize access to electricity in the region, and make the transition to a clean and quality source, enabling:

/ Incentives for sustainable local economies

/ Greater efficiency in electricity supply

/ Reduction of socio-environmental impacts associated with electric power generation

Our successful experience with programs of this nature began with **Ilumina Pantanal, in 2014**. Since we took over the concession in MS, we started studies for universal access. It took **6 years of R&D** until we reached the optimal version of **SIGFI, already installed in over 3,000 isolated residences**. A project as challenging as MLpA from the operationalization point of view, as it is occurring in an extensive territory of 92,000 Km², a natural heritage that houses a great diversity of cultures.

SIGFI SYSTEM - ACRE

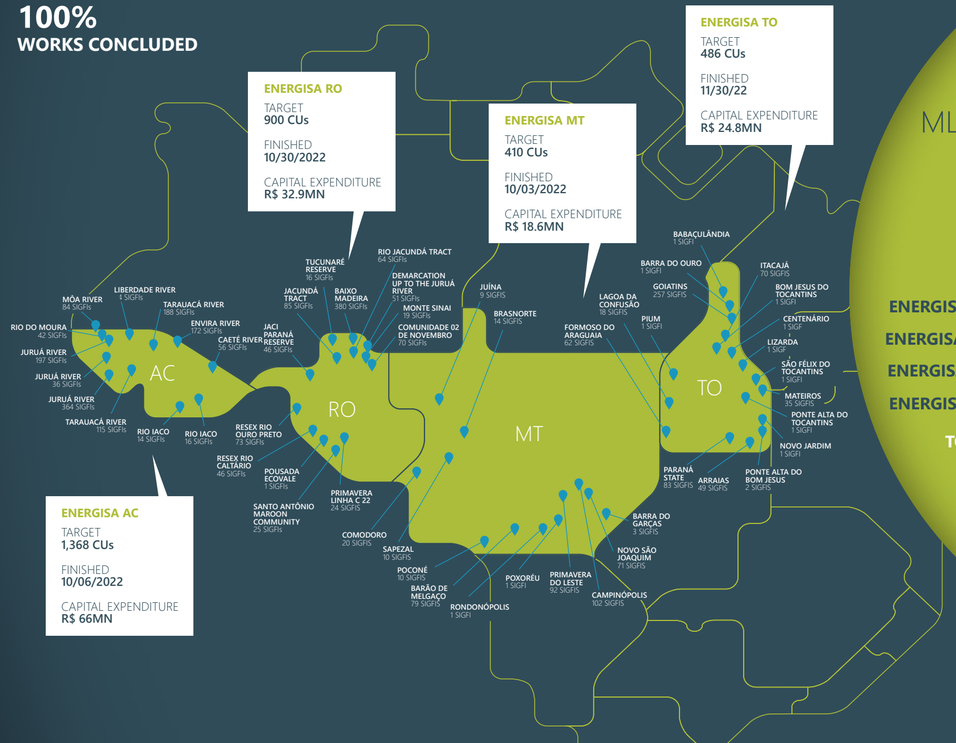
3,264
SIGFIs installed

R$ 142.5 million
invested by Energisa

2021/2022

MLpA ENERGISA TRANCH 1

100%
WORKS CONCLUDED



MLpA ENERGISA TRANCH 2

11,000
NEW SIGFIs BY 2024

	2023	2024
ENERGISA AC	2,500	3,500
ENERGISA MT	1,100	1,100
ENERGISA RO	1,205	700
ENERGISA TO	450	450
TOTAL	5,255	5,750

TECHNOLOGY DEPLOYED IN THE MLpA

SIGFI - Individual Generation System with Intermittent Source

A micro-individual solar energy generator for each customer.

According to the CU's profile, SIGFI can have a capacity of 45, 80, or 160 KW/month. The smallest are for CUs that do not have appliances, and the largest are intended for schools, health clinics, and churches.

4 SOLAR ENERGY PANELS
With the capacity for 80KW/Month: 3 LED lamps, 1 refrigerator up to 207 liters, 1 fan, 1 TV up to 32", radio and cell phone chargers.

LITHIUM ION BATTERIES
(the same as electric cars)

As solar irradiation, which is the energy source, is not available 100% of the time, the system has a battery bank, which stores the energy generated for up to 36 hours.

Latest generation

Highly efficient

No risk of leakage

Durability

8x smaller and 4x lighter than lead-acid ones

The customer does not pay for the installation, only for the monthly energy bills, which follow the social rate or rural rate.

3,264,000 customers benefited
2021/2022

2021 AWARD
SOLAR & STORAGE Innovation and Solar Generation

HOW WE BRING ENERGY TO REMOTE AREAS

SATELLITE MAPPING

A survey of buildings that could potentially be served by the program is undertaken.

SOCIOECONOMIC SURVEY

Teams from Energisa (TO) or outsourced (AC, RO, and MT) move by boat and car to the region and visit all the locations referenced by satellite.

During the visits, professionals carry out a socioeconomic survey of each family to ascertain their needs: profile of the members (age, education, work and income), housing conditions, basic sanitation, available means of communication, ways to deliver energy bills, etc.

These data let us measure the capacity of the SIGFI to be implemented (45, 80, or 160 KW/month) and to identify the social gaps in education, individual or community vocations for productive inclusion and income generation.

PARTICIPATION OF EACH FAMILY

Each family is informed about **how the system works and decides whether or not to adhere to it**. As everything is very new and there is often mistrust that the installation will actually be done, there are families who only decide to join when they see the equipment being installed in their neighborhood.

WORK PLAN

Based on the survey of needs, a work plan is made that **establishes the best logistics for implementation**, considering economic, social, cultural and environmental factors of each region.

SIGFI INSTALLATION AND KIT

Even with a modular system, designed to be as light and portable as possible, **the logistics to transport SIGFIs to hard-to-reach areas is a challenge in and of itself. Every type of modal is mobilized to overcome the obstacles that arise.**

In many places, we rent **houseboats** for the team to spend a season going down the rivers and installing the equipment.

In addition to SIGFIs, teams install an **internal lighting kit** with lights fittings, outlets and LED lamps, and instruct users on which appliances can be connected at the same time.

MAINTENANCE

Performed in two stages: **preventive** maintenance is performed every 6 months, including cleaning of components and current measurement; and **corrective** maintenance occurs upon the customer's call via 0800 in case of failure or system failure. Under the regulations, we have 48 hours to respond to the call, which, depending on where the residence is located, can pose an almost insurmountable challenge.

Callouts are infrequent and mainly caused by grid overloads. With the arrival of electricity, families tend to acquire appliances and plug them all in at the same time. Our teams teach them to alternate usage to avoid overloading.

CHALLENGES

TIPTOEING ON THE GROUND

Houses located within the forest pose a huge challenge and requires teams experienced in moving through the territory.

ALL MODALS

The journey to some residences and villages can take up to 24 hours, involving transportation by plane, land, river, and in some cases, on foot through the forest. In many situations, our teams need to transport the equipment on foot, as there is no other way to proceed.

ANOTHER TIME

There are localities that are only accessible at certain times of the year, according to the rainfall calendar.

RESPECTING INDIGENOUS CULTURES

Access to indigenous villages is negotiated, step by step, with the regional coordination of FUNAI and the leaders of each tribe, respecting local times and rites. There's also a language barrier.

That's why we've prepared a special communication plan to provide these future customers with all the necessary information about the program. One of the most efficient tools were **podcasts** developed by teams specialized in communication with indigenous people, one of them available in Portuguese and in the Mebengokrê language, one of the most spoken in the region. Our teams also undergo training at FUNAI for interaction with each tribe.

FROM OUR EMPLOYEES' PERSPECTIVE

"We rented a boat-hotel for two weeks to be able to make the first connections on Dry Land. It's practically impossible to bring the traditional power grid there. The forest is dense, there are many rivers, so the photovoltaic panels were the most intelligent and efficient way."

Alfredo João de Brito, manager of construction and maintenance at Energisa Rondônia

"One home spent 1000 Reais per month just on fuel to feed its generator to have 8 hours of power. Besides the practicality of having energy 24 hours a day, saving is always good business for everyone. It's a joy to have good, quality energy all day. Since then things have only got better. Today you can watch television, have cold water, produce pulp or something inside the house to have an income."

Sebastião Junior, Distribution Technician at Energisa Rondônia

CUSTOMER TESTIMONIALS

"It used to be dark, there was no energy, there was nothing. We used a little light engine in the early evening and for a few hours during the day because the fuel consumption is very expensive. Now, with energy, I can even work at night and set up my bread factory."

Maria de Fátima dos Santos, President of the Association of Rural and Extractive Producers of Dry Land

"It's a gratifying achievement. It's much better for us. We were really struggling to do our work and now with the power, it's 100% better."

Vislimar Jeorge dos Santos, barber

"As we are sustained by fishing and hunting, which is not always possible, we can now buy and store food for times of need. We can buy a frozen chicken or a sausage, that we couldn't before because there was no way of storing it."

Joelson dos Santos, farmer

"We only had a portable generator to preserve food and the light came from a lantern. But the generator would break down and we would lose meat, lose fish because we had to spend two weeks waiting for the part to come from Porto Velho. "

Oscarina Vieira, housewife

"I used to use a lot of diesel and today we know that diesel pollutes. Clean energy is important because we don't pollute the environment, right? Many people don't care about the smoke, but it worries us because our children are still young. Education also changed a lot. With the TV, we watch a lot of things that serve as life lessons. We watch the news and see what happens out there. Before we didn't have this: when there was a radio, there were no batteries. Today it has improved a lot with electricity."

Aldair Gomes Vieira, flour producer

ACRE

ACRE


RONDÔNIA


RONDÔNIA


MATO GROSSO


TOCANTINS

MLpA: A VERY FAVORABLE AGENDA

The indexes that measure the favorability of the published reports about the advances of universal access to energy and its effects in transforming the lives of people and communities are always 100% positive.

between 2020 and 2023

286	78.9 MM	R$ 4.66 MM	72 min
articles	people potentially impacted	gains attributed	Tv air time

Click here to see all TV reports about Energisa's initiatives linked to the MLpA.

UNIVERSAL
ENERGY ACCESS
VILA RESTAURAÇÃO

ANEEL R&D

VILA RESTAURAÇÃO
RIVER COMMUNITY IN ACRE
200 CUSTOMERS/~1000 INHABITANTS

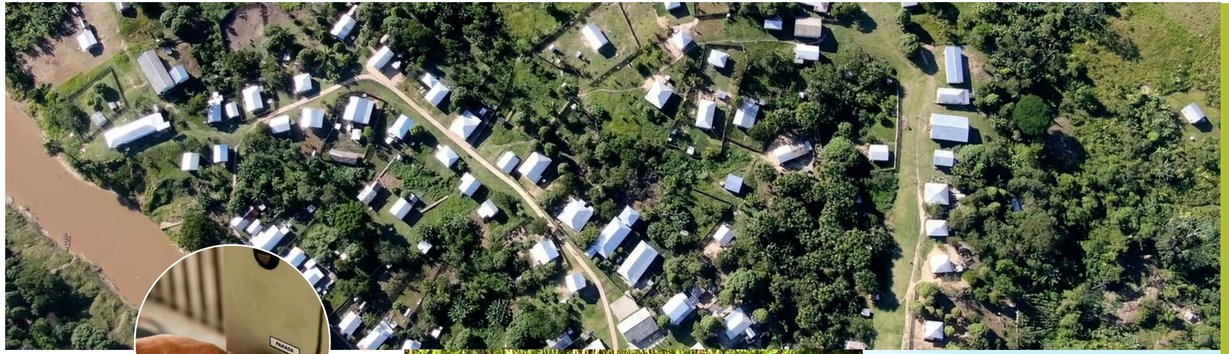
We arrived in Acre less than five years ago with a commitment to universalize the energy supply for all residents.

The local reality includes not only isolated residents, but small communities located in hard-to-reach areas.

After the successful experience of the SIGFI system to serve the residents of Pantanal, we needed a sustainable solution that served these isolated communities with the same energy efficiency and quality.

With the subsidy from ANEEL's R&D, we chose the remote Vila Restauração as a pilot for the development of the MIGDI system.

The residents already had some experience in energy. Precarious, expensive and polluting,



DIESEL GENERATOR
Power for 3 hours a night
Precarious, polluting, expensive, and fossil-fuel-based

but they had it. A noisy diesel generator, paid for by the municipal government and the residents, generated power for about 3 hours a night. It was enough to watch something on TV, charge the phone, and cool the fridge, but not enough to prevent food waste or allow the health clinic to store vaccines and serums.

CHALLENGE

Provide energy to the community's residents, accessible only by boat, in a journey of about 6 hours from the nearest town (120Km).

PROJECT REQUISITES

Off grid and renewable

Equipment and materials needed to be transportable by boats and canoes

Small environmental footprint

Highly energy efficient

Low need for corrective maintenance

Allow the sharing of excess quotas among residents

Replicable/applicable in universalization programs, auctions of isolated systems

THE SOLUTION WE DEVELOPED

MIGDI - Microsystem for Isolated Generation and Distribution of Electricity

We spent two years on R&D for a unique system: an **isolated microgrid using a sustainable hybrid generation source** (photovoltaic plant and complementary B100 biodiesel generator), **capable of serving the entire community, associated with a highly effective energy storage system.**

With the plant, we began to provide clean and renewable energy, **24 hours a day and at a low cost,**, to the residents.

2022 AWARD

SOLAR & STORAGE Innovation and Solar Generation

Due to its efficiency, the solution that transformed the life of Vila Restauração won the international Solar & Storage Live Awards in the Innovation category and is being adapted to be installed in new communities.

PROJECT COSTS

ANEEL

R$21.85 MN

was invested, using funds from the ANEEL R&D Program

R$40,137* CAPEX/CU

(competitive with SIGFIs)

*considering CAPEX of R$12,654,887.65 (plant) and limit of 363 CUs + cost of grid and CU adaptations (+R$1.91M)

R$197/CU/month
Current OPEX

229 CUs

R$123/CU/month
Projected OPEX

363 CUs (maintaining the current low penetration of biodiesel)

CONSTRUCTION

The 200 tons of equipment were transported by huge **trucks from Uberlândia (MG)**, where the headquarters of (re)energisa, our renewable energy unit, is located, **to Cruzeiro do Sul (AC)**.

From there, it **was a further 7-day journey by tanker barges**, which only progressed when the water volume was sufficient. The community watched the equipment arrive with bated breath.

Over 20 local residents were hired during the construction phase of the system, generating jobs and training.

2 years development

6 months execution

200
professionals involved

200 tons
of equipment

3,637 KM OVER LAND
10,000 KM BY RIVER

1 single shutdown
due to human error
(1 hour without power)

263.6 MWh
total energy provided to loads

5 KM
medium and low voltage distribution grids for CUs connection

229
CUs served
(up to 363 can be served)

58,000 tCO_2/year
equivalent not emitted/ year

SOLAR CLUSTERS

575
panels

325 kWh
installed capacity

2
B100 biodiesel generators (backup)

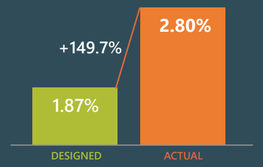
2 x 125 kW, automatically triggered by the plant's energy management system in case of insufficient solar generation.
Average biodiesel penetration: ~ 1.7% (discounting the use of the generator for R&D tests)

828 kWh
energy storage

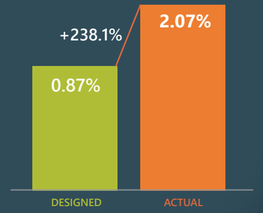
4 lithium battery racks of 207 kWh each, installed in a container with its own cooling and fire-fighting system.

GROWTH OF LOAD AND TOTAL CONSUMPTION
a.m.

LOAD



CONSUMPTION



THE OPERATION

CONSUMPTION CONTROL AND CREDIT SHARING BETWEEN CUs

A grid that adapts to customer needs

Real-time monitoring and the use of algorithms for smart and remote control of the system ensures maximum efficiency and energy availability for customers.

Each customer can consume up to 80 kWh/ month. Hemera monitors each customer's monthly consumption, limiting the meter's power when the limit is exceeded ("social cut-off"). The limiter is deactivated at the beginning of the month.

In the "social cut-off" mode, the meter allows the Consumer Unit (CU) to consume less power, sufficient to keep critical loads operating.

The credit transfer platform allows residents to consume more than their initial limit, as long as it is offset by another Consumer Unit (CU) that has reduced consumption.

The negotiations for credit transfers are made among the residents themselves.
The platform is just a means to record what has been agreed upon.

TELEMETERING

To ensure effective customer consumption control and eliminate the need for meter readers to travel to the Village, we opted for the implementation of a **smart metering system** for each CU (ZEUS8021e 8023).

A partnership with TIM made it possible to connect the meters via NBIoT with the Hemera through the CAS's NIC communication device.

CONSUMER UNIT (AMI + NIC)

TIM TELECOM TOWER

HEMERA

PAYMENT AND BILLING MODEL

Convenience and efficiency with PIX and Voltz (Energisa's Fintech)

*accessible via internet by the telecom tower installed in Vila Restauração

MUCH MORE THAN ENERGY

As part of our commitment to deliver social and economic development through energy, we brought a series of structural improvements to the Village's residents.

ENERGY EFFICIENCY

To make the most of the energy we're providing, we donated energy-efficient equipment:
105 refrigerators + 50 freezers + 1,000 light bulbs

FINANCIAL INCLUSION

Another concern was how the villagers would pay their bills, especially given the fact the nearest agency is a 9-hour trip away. For this reason, we provided them with free cards from Voltz, a fintech of Energisa Group. People can use these cards to pay bills and access key banking services, promoting digital, financial and technological inclusion for the riverside population.

TELEMEDICINE

To improve health care for the residents, we connected the Conexa Saúde telemedicine platform with the municipal government of Marechal Thaumaturgo, and donated two laptops to enable online appointments. Thus, the villagers now have access to various medical specialists, with reduced cost and travel time to the city.

INTERNET AND MOBILE PHONES

In partnership with TIM, Vila Restauração received the region's first 4G antenna. With it, the villagers now have access to quality internet and mobile phone services.

BASIC SANITATION

We invested in the development of a sewage disposal project for the Vila, with the collaboration of partners experienced in the topic – Iguá Institute and the NGO Biosaneamento. Created based on active listening to the municipal government of Marechal Thaumaturgo and the villagers, the project included all the necessary specifications for efficient implementation and is now in the fund raising phase by the Municipal government.

INCOME GENERATION

In partnership with Sebrae, the Rural Producer Entrepreneur course helped identify income generation opportunities and local development, providing villagers with notions of innovation, entrepreneurship, marketing, business model and finance. With family farmers, we conducted a diagnosis of the main production systems used, pointing out potential and limitations. Emater contributed by clarifying queries about access to rural credit.

PRESS COVERAGE

416	53.2 MM	R$ 7.89 MM	7 min 24 sec
articles	people potentially impacted	gains attributed	Tv air time

Click here to access all TV reports about Energisa's initiatives linked to Vila Restauração.

CUSTOMER TESTIMONIALS

"We suffered a lot here in the dark. The lack of energy caused a lot of food to spoil. So, when we saw the barge arriving with the poles, it was a joy for the whole community."

Maria Ivone Cunha

"When we saw that beautiful image of the fully illuminated power plant, it was very gratifying. The motor was running and all we heard was that silence. Just the lights on and everything working."

Gildete Lima

"Energy also generates income for us. Whereas before we couldn't make ice cream, now we can. I can serve the customers in my little shop at any time. I don't need the flashlight."

Antônia Edinês Silva

"After the light, the arrival of the bill was the greatest joy. Before we paid 55 Reais for 3 hours of energy and now it was R$ 18.40 for 24 hours of energy."

Maria Ivone Cunha

"Nobody expected such a place, in the middle of the forest, to have quality energy. It's a blessing we never imagined."

Raimundo Nogueira da Silva

"People in towns and cities may take having electricity all day for granted, but for us here it is something that completely changes our life. Now I will be able to drink cold water, store food without fear of losing it and I will be able to watch Flamengo play whenever I want."

Deison Furtado

Employee

"I had the honor of participating in this project as a technical inspector for the construction of the distribution network, the greatest professional challenge of my life. It was five months of work with that community. A feeling of duty fulfilled not only for professionalism, but also for bringing more social inclusion to all families in that community. One of the greatest emotions of my life was when we did the first test, I saw people crying and thanking God and the professionals who were there at that moment. Congratulations to all who were part of this project. Best wishes to the community."

Jeann Loredo

GRUPO energisa

ENERGY
A CONNECTION BUILT
WITH EVERY GESTURE,
WITH EVERY WORD

THE ARRIVAL OF ENERGY STIRS PEOPLE'S IMAGINATIONS AND LIVES. FOR THE CUSTOMERS, IT'S LIKE GOING TO THE WORLD, EXTENDING THEIR BELONGING TO NEW FRONTIERS.

That's why our approach with customers on projects of this nature has a different sensitivity.

In the case of universal access projects, as it is their first time as customers of a utility company, , we act at a slower pace, building trust and connection, listening to their needs, explaining calmly how we will bring energy to them, and clarifying their queries.

Both in the More Light for the Amazon Program (MLpA) and the R&D of Vila Restauração, the challenge was great because we had **customers with very specific profiles**. Various indigenous peoples, isolated residents, riverside inhabitants, and in Vila Restauração, people with a more urban profile.

For this reason, **we prepared our teams to treat each customer with the utmost respect**. Interpersonal communication was our main strategy. We encouraged our front line to take the necessary time in the service, helping customers with small domestic problems, playing with children, and celebrating the achievement of energy to strengthen ties.

For our employees, these are **exciting experiences, bringing a new perspective on what their work represents**.

**THIS IS OUR WAY OF DELIVERING ENERGY:
WITH DELIVERIES THAT GENERATE REAL TRANSFORMATION IN THE LIVES OF PEOPLE AND TERRITORIES. FOR THE BETTER.**