Infrastructure planning to deliver the climate transition in Brazil

Infrastructure Forum – The pathway to infrastructure sustainability

Sep/2022

Secretary for Infrastructure Development
SDI/SEPEC/Ministry of Economy

MINISTRY OF
ECONOMY

“The future is green and digital”

Theses words represent two important drivers of the Brazilian infrastructure planning process.

Climate change and ESG goals are part of society’s set of concerns, which affect firms’ and governments’ decisions.

By acknowledging that these will be constant factors in international relations, trade, production technologies, economic and social resilience, etc., infrastructure policies and outcomes must also go in this direction.

2019 CONTEXT

Several statistics pointed to a **strong gap** between optimal and actual infrastructure **investments and capital stock**.

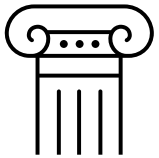
Important **fiscal constraints** of the public sector at the federal, state and municipal levels.

Regulatory barriers to competition and private entrepreneurship in many sectors.

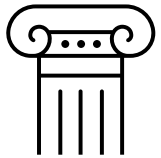
Need of improvements in the **decision process** of public budgetary allocation.

Brazillian action plan has been based on four pillars

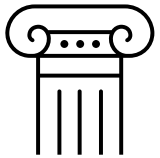
Governance



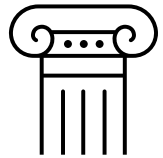
Transparency and Monitoring



Regulatory Reforms



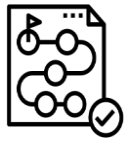
Financial mechanisms



INFRASTRUCTURE GOVERNANCE REFORM

Decree 10526/2020 creates **Interministerial Committee for Infrastructure Planning** to foster better governance practices for infrastructure investment

Integrated Long Term Infrastructure Plan to harmonize existing plans from different sectors and require social-economic valuation for large-scale projects



Dissemination of standardized methods for project preparation (Five Case Model Guidance), ex ante valuation (CBA Guide), and ex post valuations.

Standardized methodologies for **structuring** projects aligned with international references for environmental and social assessments

Capacity building programmes to disseminate best practices and accelerate the development of better investment projects.

INVESTMENT MONITOR

The Investment Monitor is a **hub** of information about **investments** and **sustainability** in Brazil that aims to facilitate access to relevant data and promote interaction between government, investors, academia, multilaterals and the civil society.

MONITOR DE INVESTIMENTOS

INOVAÇÃO E SUSTENTABILIDADE

PARTNERSHIPS IN THE DESIGN OF THE INVESTIMENT MONITOR

INVESTMENT MONITOR

MONITOR DE INVESTIMENTOS
INOVAÇÃO E SUSTENTABILIDADE

ABOUT PANELS OTHERS

MINISTÉRIO DA ECONOMIA

Macro

View scenarios and projections of investment and socioeconomic indicators.

Sector

View scenarios and projections of investment indicators by sector.

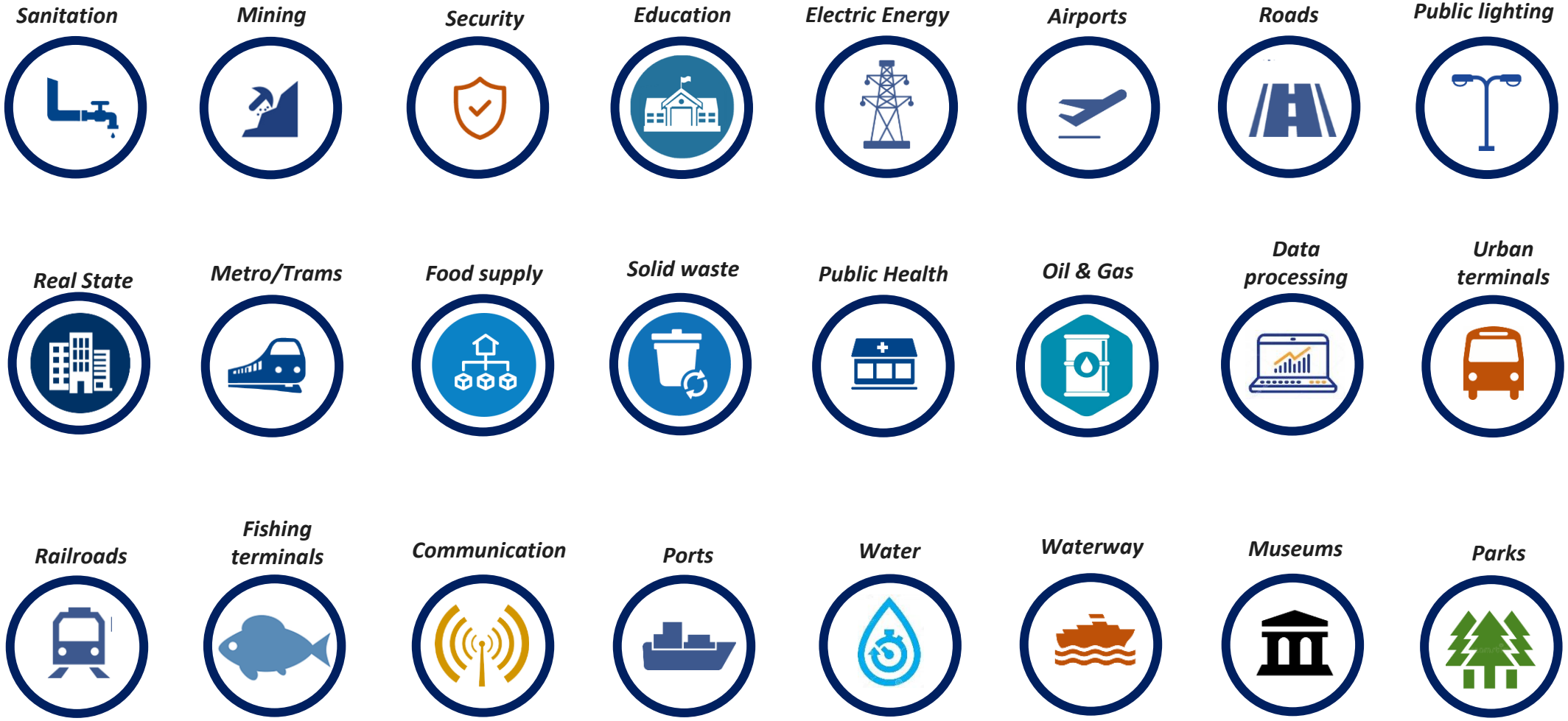
Projects

Get to know the main projects being planned and executed in the Brazilian economy.

Radar

Find technical notes, regulatory studies, templates and other documentation related to infrastructure.

PROJECTS PANEL - PIPELINE



PROJECTS PANEL - INVESTMENTS

+USD 180bi

Estimated **CAPEX** of the investments projects auctioned or authorized by the Federal Government since 2019

PROJECTS PANEL – SUSTAINABILITY REFERENCES

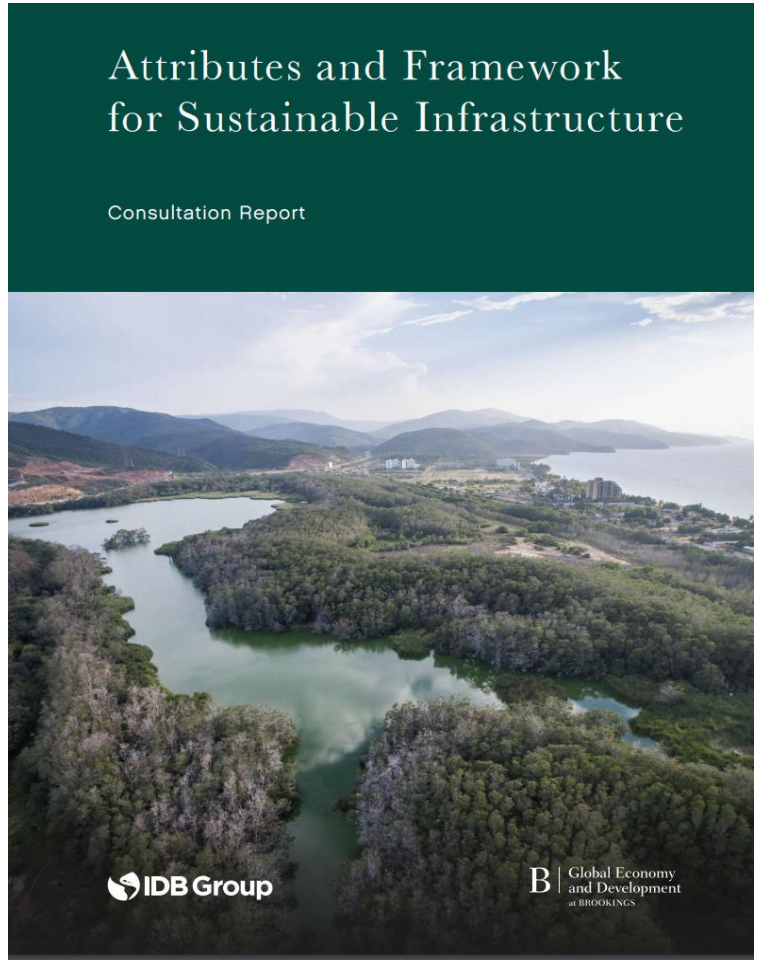
PARIS2015
UN CLIMATE CHANGE CONFERENCE
COP21·CMP11

SUSTAINABLE DEVELOPMENT GOALS

MEXICO PROJECTS HUB
INVESTMENT & INFRASTRUCTURE

Blue Dot Network

G20 PRINCIPLES FOR QUALITY INFRASTRUCTURE INVESTMENT



PROJECTS PANEL – FRAMEWORK FOR SUSTAINABLE INFRASTRUCTURE

Dimensions 4	Phases 4
Atributes 49	Maturity levels (tiers) 3

PROJECTS PANEL – FRAMEWORK FOR SUSTAINABLE INFRASTRUCTURE

SOCIAL

- Poverty, Social Impact and Engagement with Communities
- Human and Labor Rights
- Cultural Preservation

ENVIROMENTAL

- Climate and natural disasters
- Preservation of natural environment
- Pollution
- Efficient use of resources

GOVERNANCE

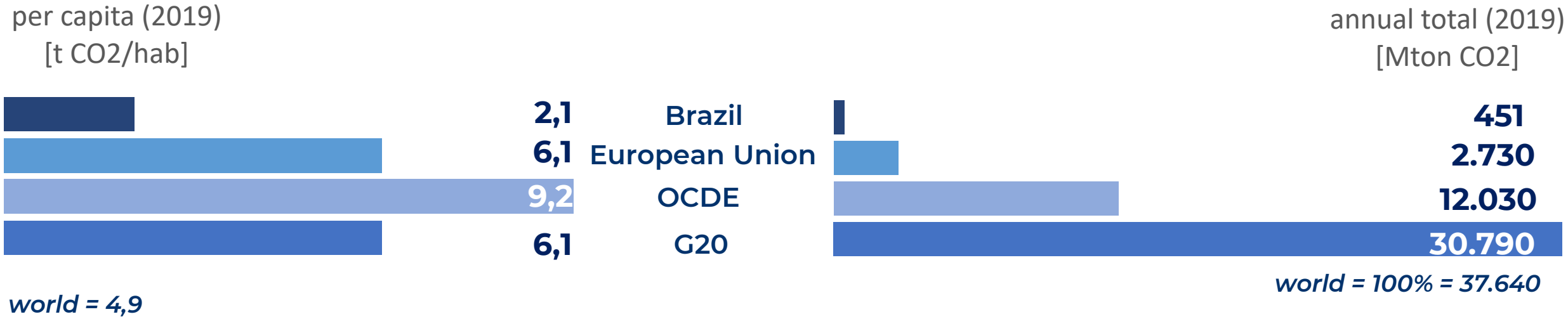
- Alignment with Global and National Strategies
- Governance and Systemic Chance
- Effetive Management Systems and Accountability
- Capacity Building

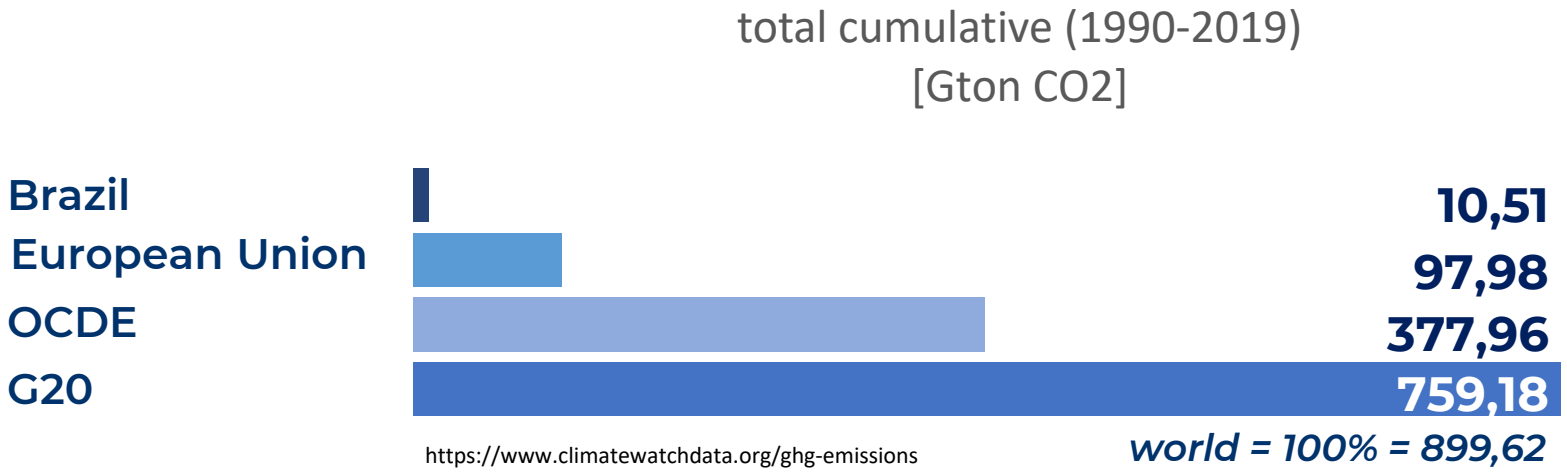
ECONOMIC AND FINANCIAL

- Financial sustainability
- Policy attributes
- Economic return

www.gov.br/investimentos

CO2 EMISSION – ENERGY SUBSECTOR





https://www.climatewatchdata.org/ghg-emissions

RENEWABLE ENERGY

Brazil current status is equivalent to the European transition goal

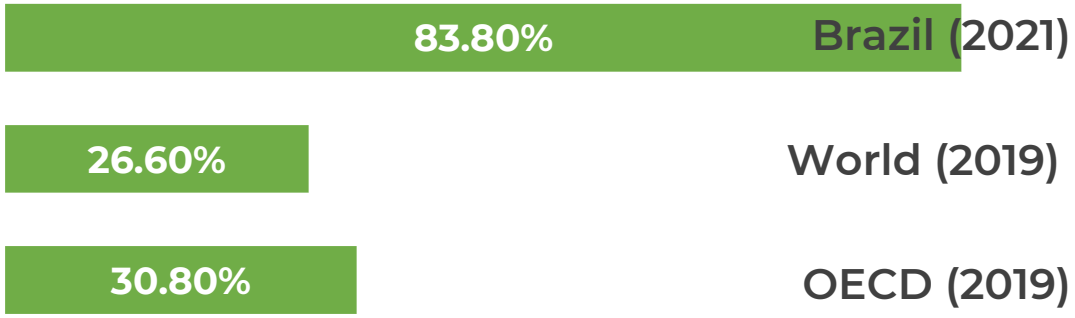
EUROPEAN COMMISSION TARGET

https://energy.ec.europa.eu/topics/renewable-energy/renewable-energy-directive-targets-and-rules/renewable-energy-targets_en

RENEWABLE (TOTAL ENERGY)

https://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/balanco-energetico-nacional-2022

RENEWABLE (ELETRICITY)



https://www.epe.gov.br/pt/publicacoes-dados-abertos/publicacoes/balanco-energetico-nacional-2022

CLEAN ENERGY TRANSITION: National Biofuels Policy - Renovabio

Since 2017 Brazil has a regulated market of biofuels certificates.

The goal is to reduce greenhouse gases emissions in the fuel sector.

Supply side: Biofuel producers voluntarily certify their production and receive, as a result, energy-environmental efficiency scores. These scores are multiplied by the volume of biofuel sold, which results in the amount of Decarbonization Credits (CBIOs) that a given producer can issue and sell on the market.

Demand side: Annually, the Government sets national targets for ten years ahead, which are broken down into mandatory individual targets for each fuel distributor.

Each CBIO is equivalent to 1 ton of avoided CO2eq emissions.

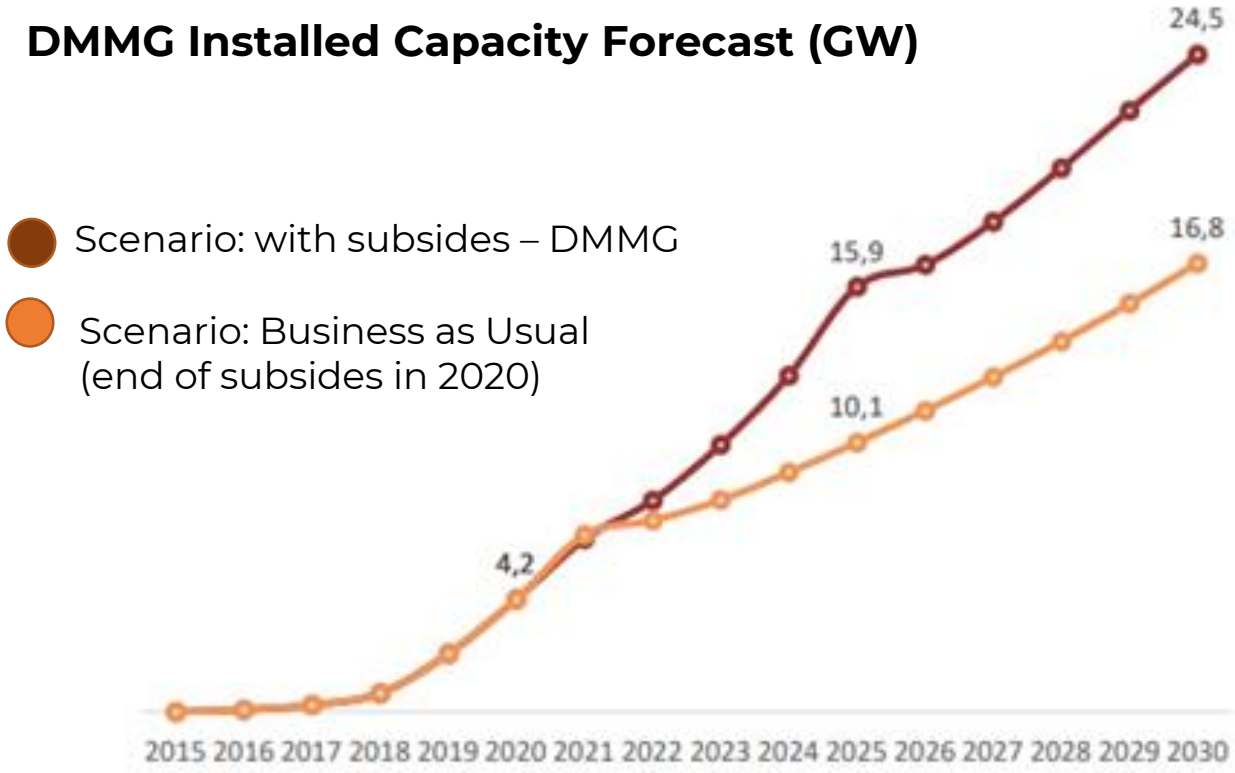
CBIO volumes traded:

2020 - 14.9 million / US$ 0.13 billion
2021 - 29.8 million / US$ 0.22 billion
2022 – 36 million (goal)

CLEAN ENERGY TRANSITION: Distributed Micro and Mini Generation (DMMG)

New Regulatory Framework (Law 14300/2022) maintains tariff subsidies for those units that requested grants before Mar/2022.

DMMG Installed Capacity Forecast (GW)



→ 4.6% of the total energy supply

→ 3.2% of the total energy supply

CLEAN ENERGY TRANSITION: Green Hydrogen

Brazil has the potential to be the largest export hub, given its endowments to develop wind and solar energy projects.

Potential wind power capacity – 10,000 GW
Potential solar power capacity – 300 GWp (only best areas)

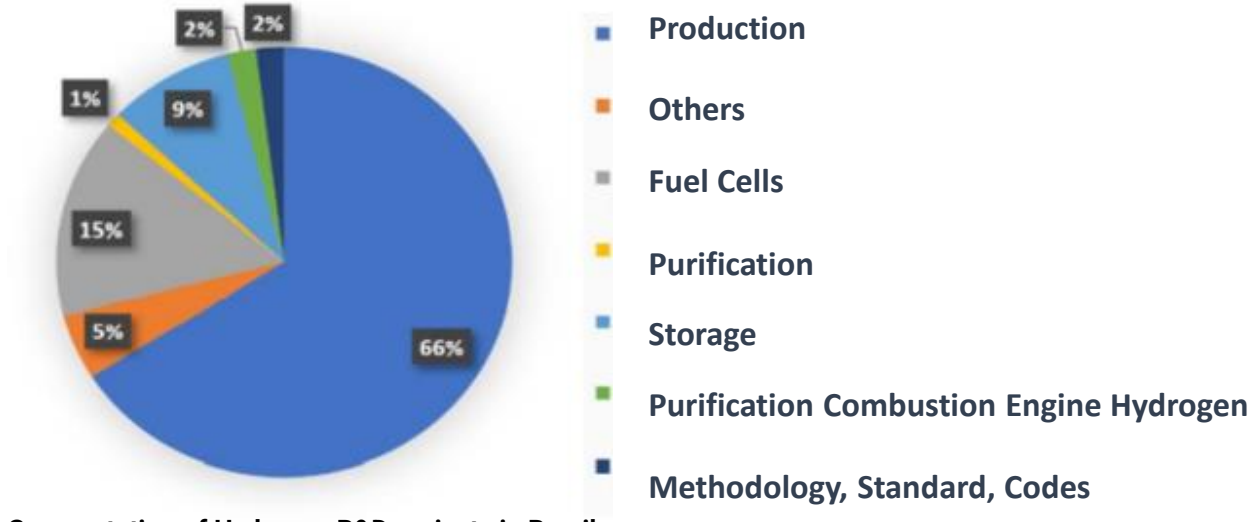
Investments in the production of green hydrogen from ethanol in the vehicle itself are also noteworthy. Ethanol would be a sort of liquid hydrogen, not requiring major changes to the distribution infrastructure.

Electric vehicle powered by a Solid Oxide Fuel Cell (SOFC) – which generates energy from the use of bioethanol. The Japanese company NISSAN has signed a new agreement with the Brazilian Institute for Energy and Nuclear Research (IPEN) to research fuel technologies for models powered by hydrogen and ethanol combined.

CLEAN ENERGY TRANSITION: Green Hydrogen

Ceara state government, Federation of Industries of the State of Ceará (FIEC), the Federal University of Ceará (UFC) and the Porto do Pecém Complex signed in Feb/2021 a memorandum to build a hub for hydrogen in the Port of Pecém, with the purpose of exporting the green hydrogen and also use in Brazil.

State government also signed a memorandum with the Australian company Enegix, which intends to install a plant for the production of green hydrogen, with planned investments of US$ 5.4 billion, including a construction of an electrolysis plant.



Segmentation of Hydrogen R&D projects in Brazil

PROJECTS IN BRAZIL: Hydrogen

Projeto	Empresa	Local	Escala	Estágio
Purificação de H_2 gerado	Eletronuclear	Angra I e II - RJ	150-300 kg H_2/d	P&D
H_2V	PTI	Foz do Iguaçu-PR	Piloto	P&D
H2V híbrido (UHE e FV)	PTI	CESP – SP	Piloto	P&D
H_2V híbrido (UHE e FV)	Furnas	Itumbiara-GO	Piloto	P&D
Reforma a vapor de bioCH_4 para produzir bioH_2 e NH_3V	Yara com CH_4 da Raízen	Interior de SP	20.000m^3/d	Comercial em 2023
H_2V em transporte público	Neoenergia	CE		MoU
Fertilizante (NH_3V)	Unigel	Camaçari – BA	Comercial	Conversão no final de 2022
H_2V e NH_3V de eólica	Enterprize Energy	RN	Comercial	MoU
H_2V	Fortescue	Porto do Açu - RJ	Comercial (300 MW e 250 kt NH_3)	MoU
H_2V	Fortescue	Porto do Pecém - CE	Comercial	MoU
H_2V	Enegix	Porto do Pecém - CE	Comercial (600 kt H_2)	MoU
H_2V	Qair	Porto do Pecém - CE	Comercial (540 MW)	MoU
H_2V	White Martins (Linde/Praxair)	Porto do Pecém - CE	Comercial	MoU
H_2V	EDP	Porto do Pecém - CE	Comercial (250 m^3 H_2/h)	MoU
H_2 azul e verde	Qair	Porto de Suape - PE	Comercial (540 MW)	MoU
H_2V	Neoenergia	PE	Piloto	MoU

Unigel signs a contract with thyssenkrupp nucera and invests US$ 120 million in the first green hydrogen plant in Brazil

July 25, 2022

Decree 10946/2022 allowed the **allocation of maritime areas** to private sector projects on wind energy and other sources.

https://www.epe.gov.br/sites-pt/publicacoes-dados-abertos/publicacoes/Documents/PDE%202031_RevisaoPosCP_rvFinal_v2.pdf p366

CLEAN ENERGY TRANSITION: Battery Energy Storage Systems (BESS)

Brazil has improved its regulation in order to allow for the insertion of BESSs in generation, transmission and distribution, allowing an increase in operational efficiency and reduction in costs.

In implementation, the first BESS in the country, using lithium batteries, with a power of 30MW.

Illustrative image of the storage system (ISA CTEEP), 30 MW.

PROJECTS PANEL - RAILROADS

The **New Legal Framework** for Railways (Law 14273/2021) allowed authorizations for investors to build their own railways, with private capital and little regulation.

The long-distance transport matrix will migrate from trucks to train. The greater energy efficiency of trains compared to trucks will allow Brazil to have a more competitive and sustainable economy the same time.

Goal Metrics:

Estimative authorization of +**8,000 km** of new rail projects with low GHG emissions and low ecological footprint by 2032.

The modal shift from roads to railways promotes a reduction of up to **85% of GHG emissions** considering diesel-propulsion for the same load unit. If the option considers electro-propulsion, the emissions are close to **zero.**

Goals:

To reduce greenhouse gases emission by switching logistics from trucks to trains; in addition, the gradual adoption of low carbon energy sources is expected: biodiesel, electric, green hydrogen, etc.

WATER SUPPLY AND SANITATION

Federal Law n. 14026/2020

- Targets: by 2033, increase of safe and affordable drinking water service from 85% to 99% of population and adequate sanitation (sewage collection and treatment) from 33% to 90% of population.
- Empowerment of the National Water and Sanitation Agency
- Increase private participation in infrastructure
- Support from the federal government to municipalities in design of contracts and the bidding documents.

Concession of water supply and sanitation services, by groups of Municipalities in the State of Rio de Janeiro

Grant Amount (US$4,883.3 MM)	Estimated Investments (US$ 6,679.6 MM)
35 years	Total Population (13.6 MM)

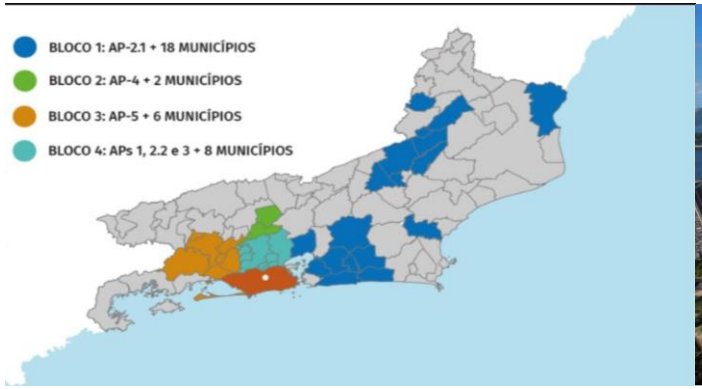
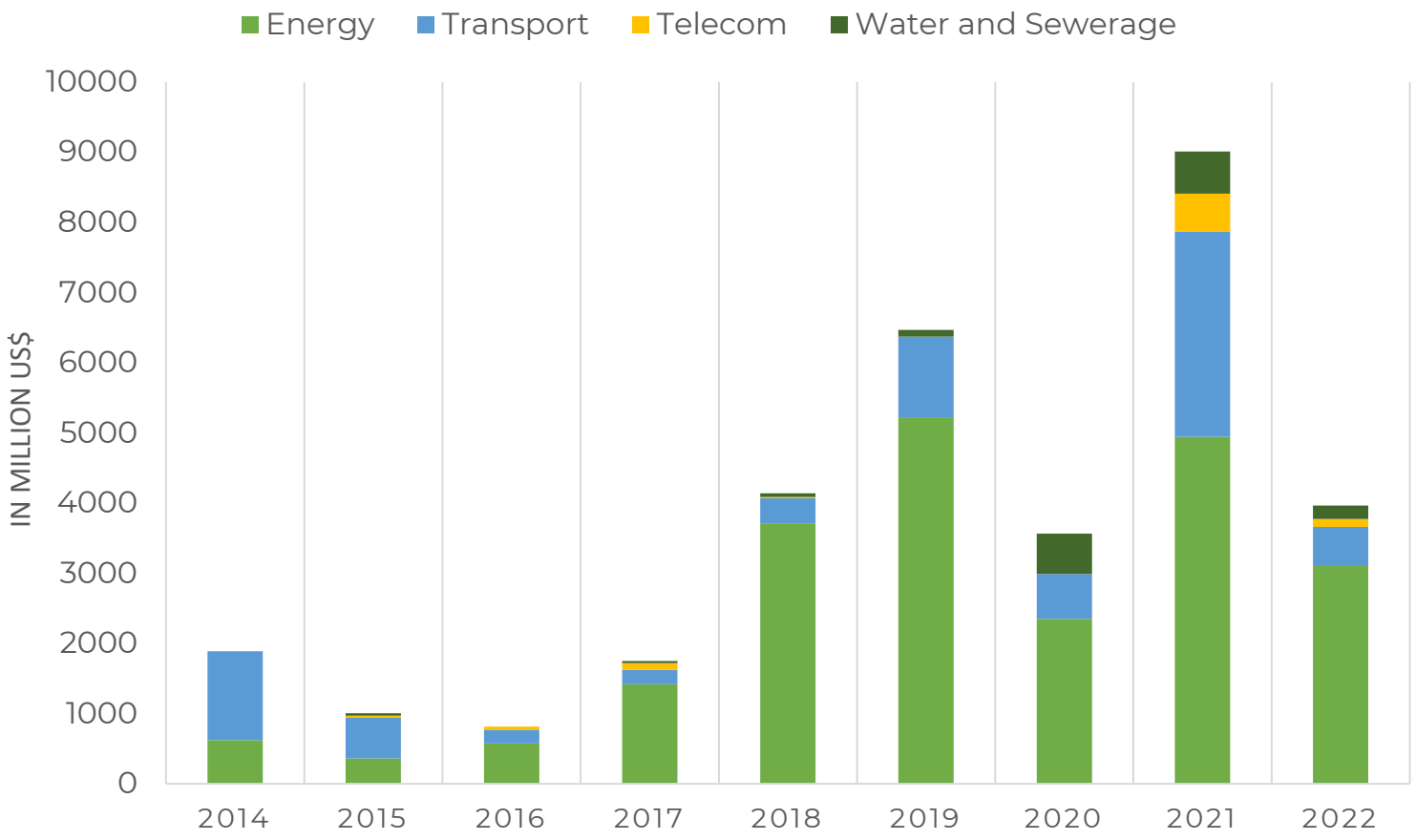


Foto: Reprodução Internet

WASTE MANAGEMENT – NEW REGULATIONS

- Federal Law n. 14.260/2021
  - Creates economic instruments to stimulate **individuals and firms** to recycle.
  - **Income tax discounts** and authorized the formation of **investment funds** to support recycling projects (ProRecicle).
- Executive Orders (Federal Decrees) n. 10.240/2020 and 10.388/2020
  - Creates the **reverse logistics system** for **electronics** (implemented in the 27 state capitals of Brazil) and **expired medicines**.
  - 33 billion aluminum cans recycled in 2021 (98.7% = a new world record).
  - 53.5 thousand tons of packaging recovered in 2021 (94% = new record)
  - 566 million liters of lubricating oil recycled in 2021 (new record)
- Executive Order (Federal Decree) n. 11.043/2022
  - Institutes the **National Solid Waste Plan (Planares)**, important instrument to materialize the National Solid Waste Policy, expected **for over a decade**.
  - +750 dumps closed since 2019 (23% reduction) – Goal 100% closed by 2024
- Executive Order (Federal Decree) n. 11.044/2022
  - Creates the "**Recycling Credit Certificate**" (Recicla+), to provide the injection of private investments in the recycling of products and packaging discarded.
  - It is expected the entry of about R$ 14billion/yr of investments in recycling.

INCENTIVIZED DEBENTURES: Infrastructure Bonds



Source: Anbima and Ministerial Ordinances
Elaborated by SPE/ME
Note:
(1) Volume by year of distribution

Infrastructure Debentures

There is a bill under discussion in the Congress that is expected to create a **new type of debt securities** to promote fiscal incentives to the issuer.

Fast track analysis, if the debenture aims to finance sustainable development projects (greenbonds).

OTHER GREEN ECONOMY INITIATIVES

Green Rural Product Certificate: Credit title intended to finance reforestation activities and maintenance of native vegetation on rural properties. The Ministry of Economy estimates a potential market of US$6 billion in four years.

“Forest+” Program (Ordinance Act 288, jul/2020): It is an action by the Federal Government to create, promote and consolidate the market for environmental services, recognizing and valuing the environmental activities carried out and encouraging their monetary and non-monetary retribution in all Brazilian biomes.

“ABC+” Plan (oct/2021): ABC stands for low carbon agriculture. The plan aims to promote adaptation to climate change and the control of greenhouse gases emissions in the Brazilian agriculture. Public credit is one of the plan's funding sources.

Thank you!

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