
2022 | Brazil

Strategic Report Remote Distributed Generation

Market Overview

 Greener

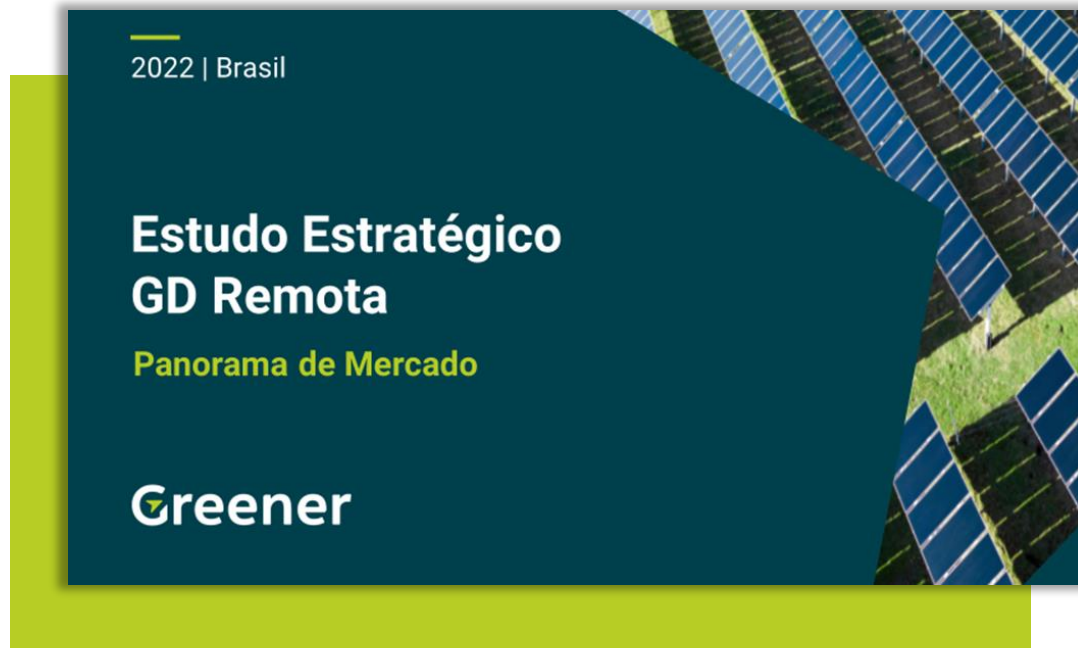


1. **2.3 GW** of remote DG PV capacity is **in operation and/or under construction**, a sharp increase compared to the 0.4 GW recorded in 2020.
2. Significant progress in Shared Generation to meet volume requirements of the **energy by subscription** business model, which is in high demand - especially among consumers in the **retail and services segment**.
3. Future demand for the remote DG model should accelerate, **requiring the construction of at least 3.8 GW** of solar PV plants **before 2024**, meaning investments of more than **R\$15 billion are needed** in the next 2 years.
4. We are seeing the development of **new, specialized business models** to be part of the Shared Generation supply chain, such as managers responsible for the capturing of and ongoing relationship with energy consumers.
5. Despite the price reduction of energy for the end consumer because of the **Complementary Law (LC) 194 which reduced ICMS / VAT**, investments in Distributed Generation have generally continued to be financially attractive.

Report Highlights

THIS IS A SUMMARY

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Contents

- 01.** Remote DG: the leasing model
- 02.** Remote DG Survey
- 03.** Regulatory Context
- 04.** Viability Study
- 05.** Conclusions

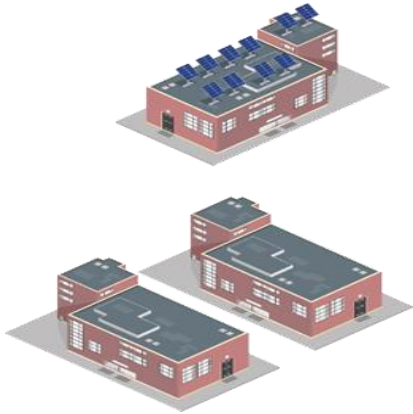
CHAPTER 1

Remote DG

The Leasing Model

Compensation Models

Remote DG Solar Power

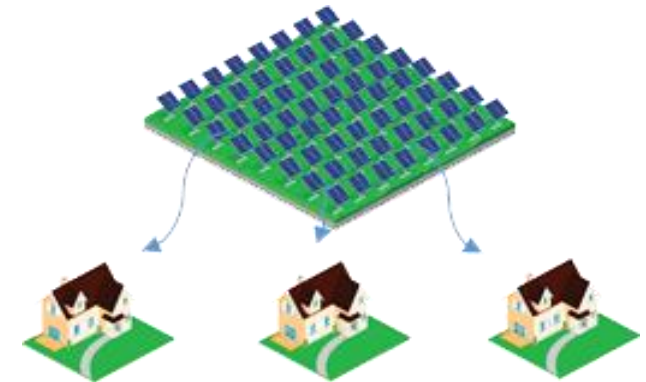


Remote Autoconsumption

- The owner of the energy Consumer Unit is also the End Customer.
- Energy Consumers under the same ownership (private individual or business), including head offices and their branches, can use any surplus solar energy credits to compensate for energy use at other consumption locations.
- All the Consumer Units must fall under the same energy distributor.

Shared Generation

- Owner of the Generating PV Asset is a consortium/cooperative.
- Allows different legal entities (private individuals or businesses) to use energy from the same solar PV plant and be compensated with credits.
- All Consumer Units must be under the same distribution company.



The Energy Manager

What value can be added to the Chain?



MANAGER - GENERATOR

- Manager which offers a complete range of services, delivering convenience for the end consumer.
- Manager supplies energy, maintenance and management of the Consumer Unit (UC).
- Client pays for all these services and is guaranteed a monthly saving on energy costs.



MANAGER - SUPPORT

- Manager which offers a complete range of services, however is not the owner of the Generating Location / PV plant (UG).
- Manager supplies maintenance to the Generator Unit (UG) and management of Consumer Unit(s) (UC).
- Client doesn't pay for energy generated and used on site, only for abovementioned maintenance of UG and management services at UC.



MANAGER - ADMIN

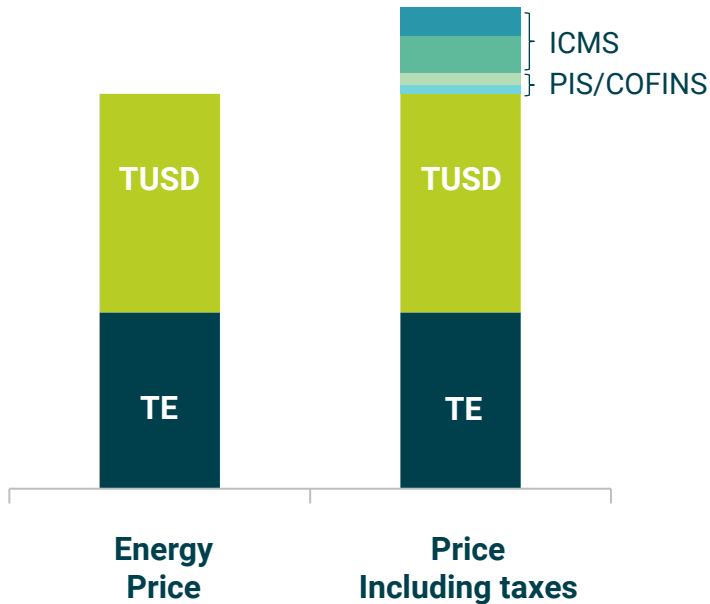
- Manager which offers a complete range of services, however is not the owner of the Generating Location / PV plant (UG) nor provides maintenance for it.
- Manager only provides Consumer Unit (UC) management..
- Client is responsible for generation and maintenance at UG and management of UC.

Energy Price, Compensatable Parts and Lease Value

Understanding the financial parameters

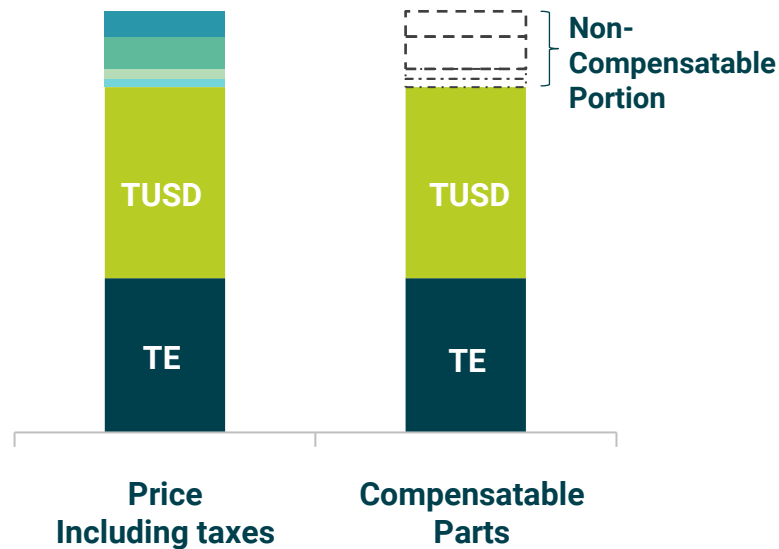
ENERGY PRICE/TARIFF

Monetary value paid by the end consumer for the energy used, including taxes. Usually expressed in R\$/MWh. The rate varies per energy distributor, type of energy user, and time of day (peak/off-peak etc).



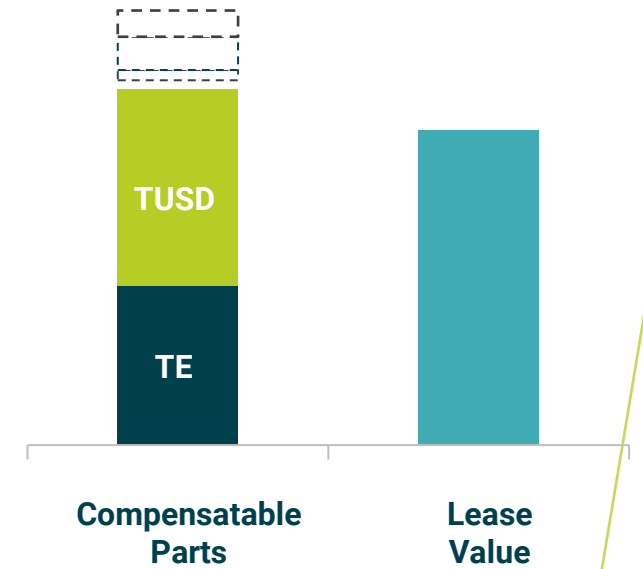
COMPENSATABLE PART

The portion of the energy price which can be compensated by energy credits generated through DG. **This depends on the chosen business model**, size of the PV plant and the regulatory window. Can be expressed as R\$/MWh or as a % of energy price incl. taxes.



LEASE VALUE

The financial value referring to the lease cost of the generating asset that creates the DG energy credits. It is calculated based on the energy price, the portion of the energy price that is not compensatable, and a % discount with respect to the energy price.

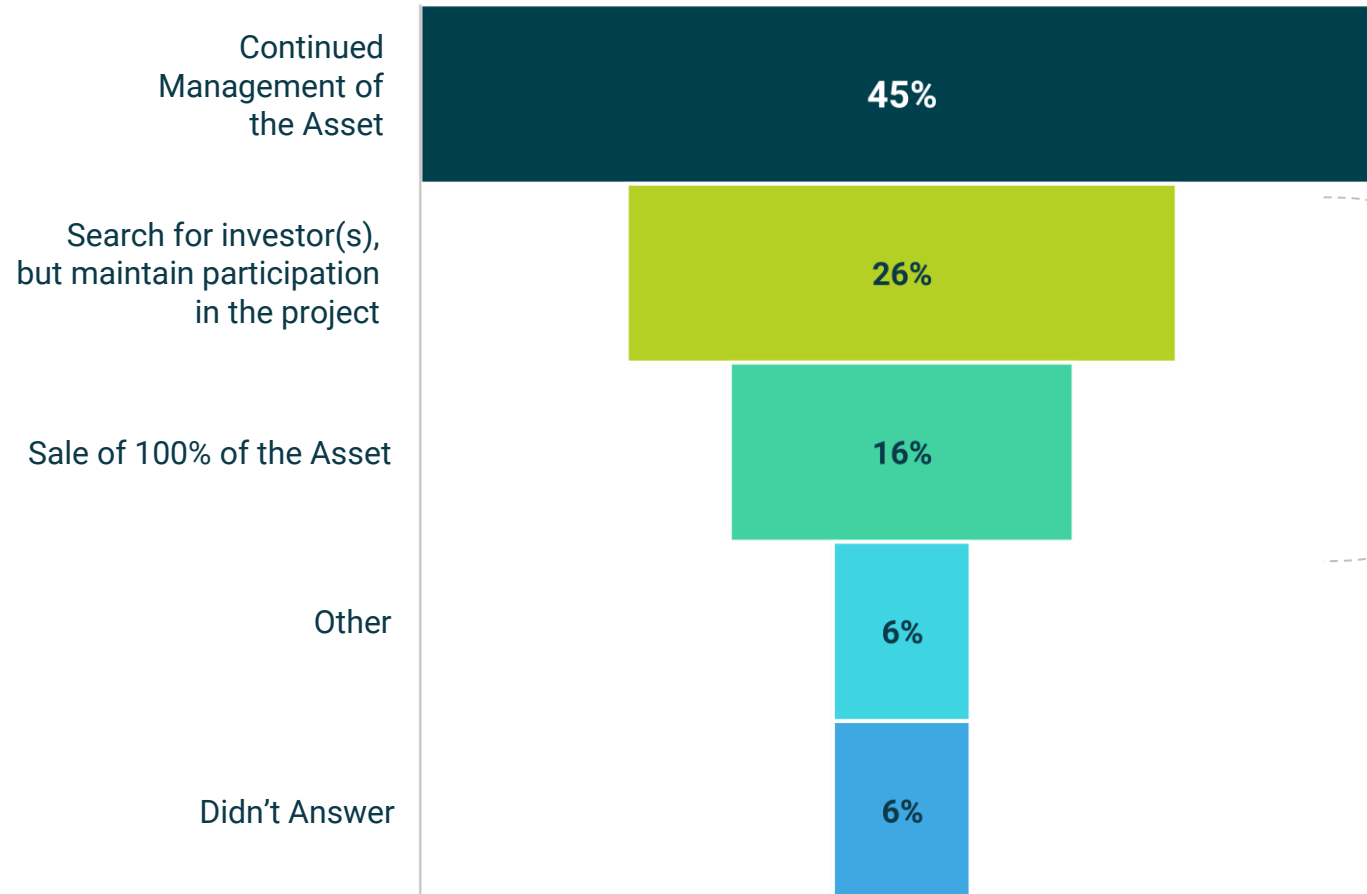


CHAPTER 2

Remote DG Survey

Principal aim for the assets

What is the main objective of the company for the PV assets?

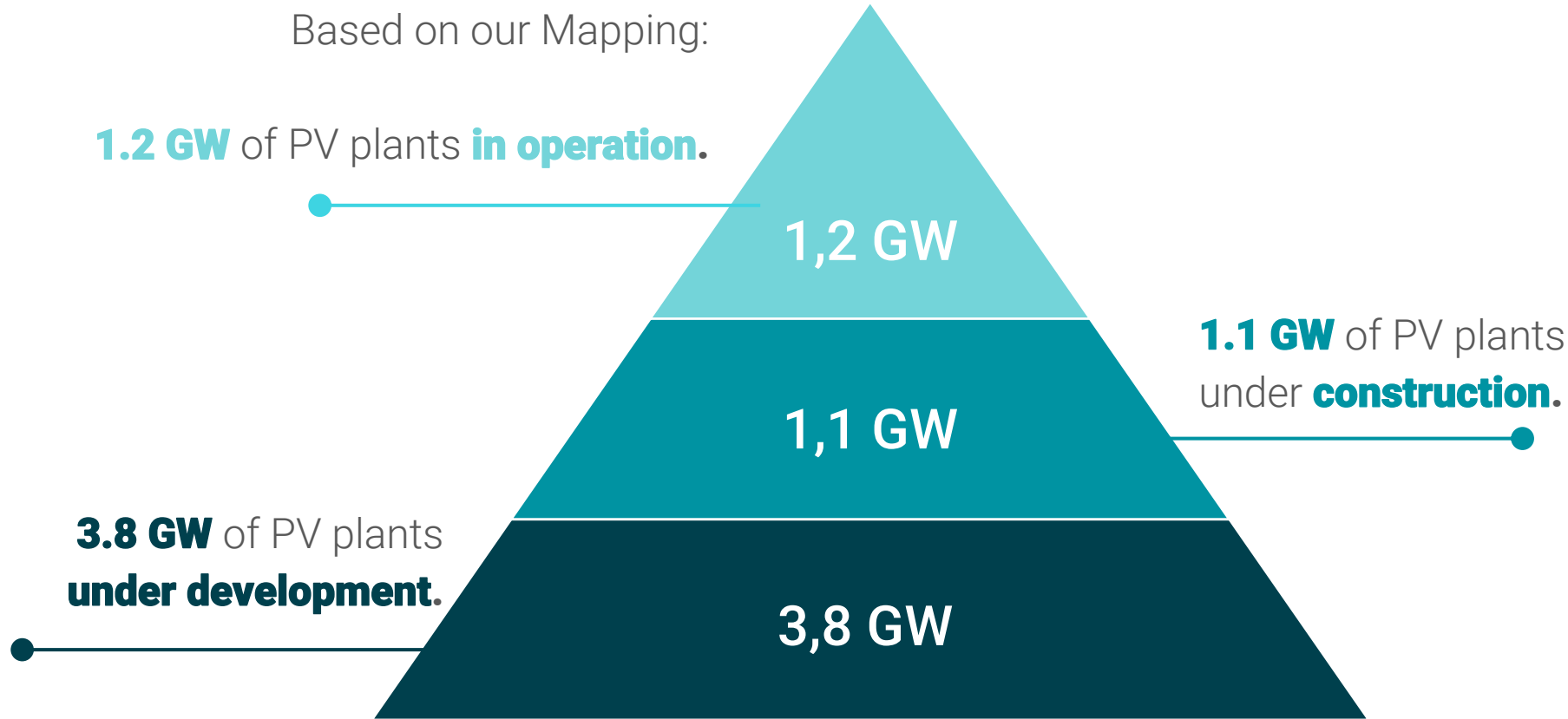


- **42% of companies** are open to offers for investment or full sale of the PV assets.
- **45%** are focused on building and structuring their own asset portfolios.

Status of PV Projects

What is the current status of large-scale solar DG projects?

Based on our Mapping:



Source: Greener, 2022

Data collected between February and July of 2022.

DG RADAR

*Conecting
Projects to
Investors*

Register your project
and find interested
investors

[Learn more >>](#)

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more than 2 GW registered...

DG Radar

Connecting Projects to Investors

- Considering the limited window of opportunities before Law 14.300 fully enters into effect, **we have created a database** to centralize the essential information about **supply and demand for PV projects**.

Register >>

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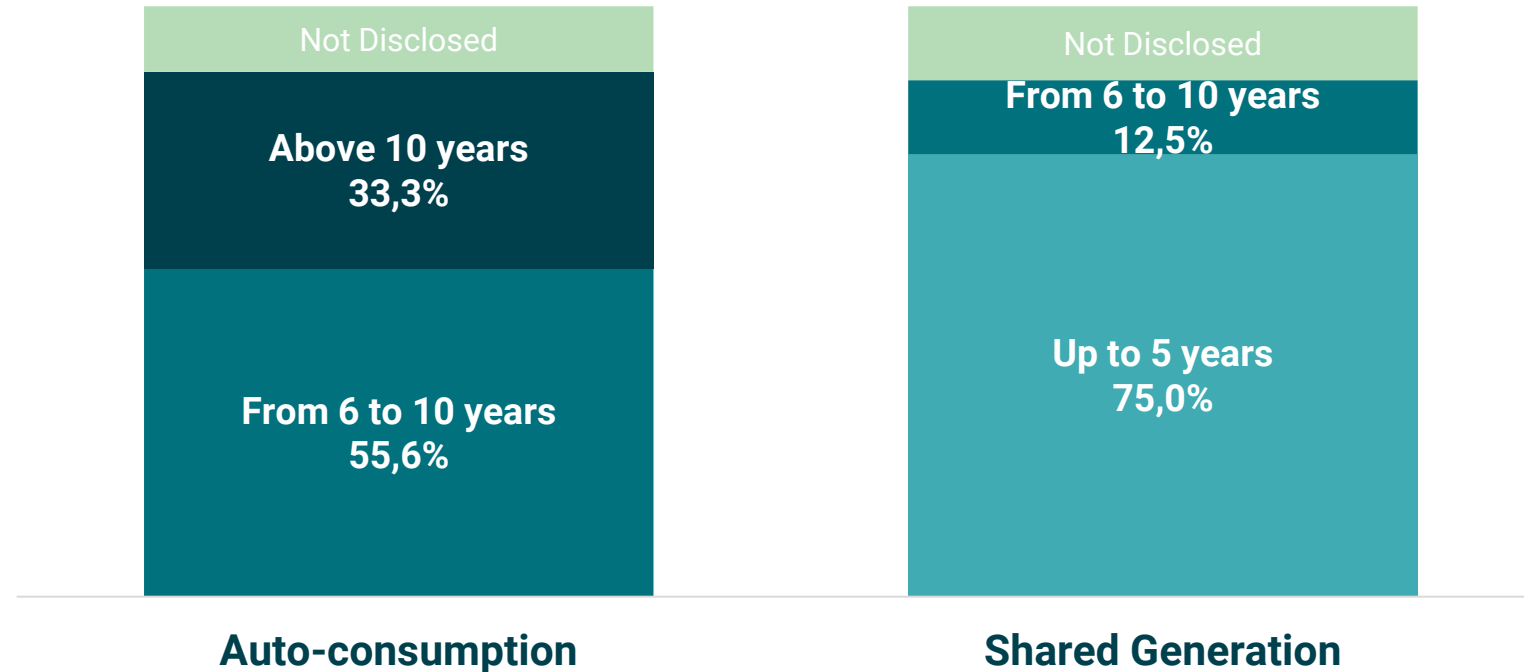
Attract investors to your solar PV projects.

Once compatible interests are identified, Greener will get in touch with both parties and will help conduct the transaction.

Imagem ilustrativa

Average Term of Contracts

What is the average lease term agreed with your clients?

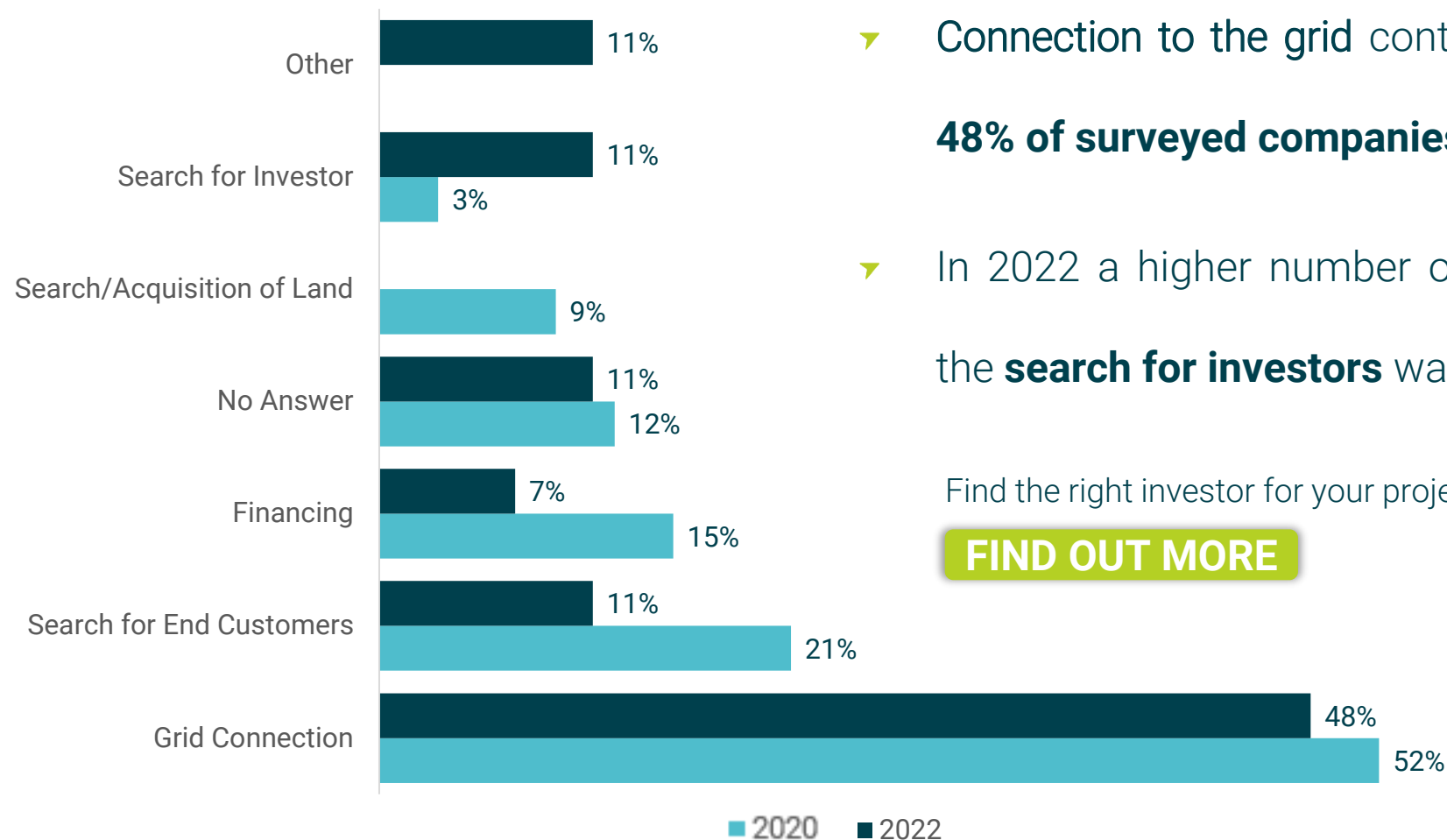


Source: Greener, 2022

- **Remote Autoconsumption:** the majority of companies closes contracts with **an average term of 6 - 10 years.**
- **Shared Generation:** **75%** of companies have contracts with an **average term of up to 5 years.**

Challenges

Main challenges encountered while developing Remote DG leasing projects?



➤ Connection to the grid continues to be a problem for **48% of surveyed companies**.

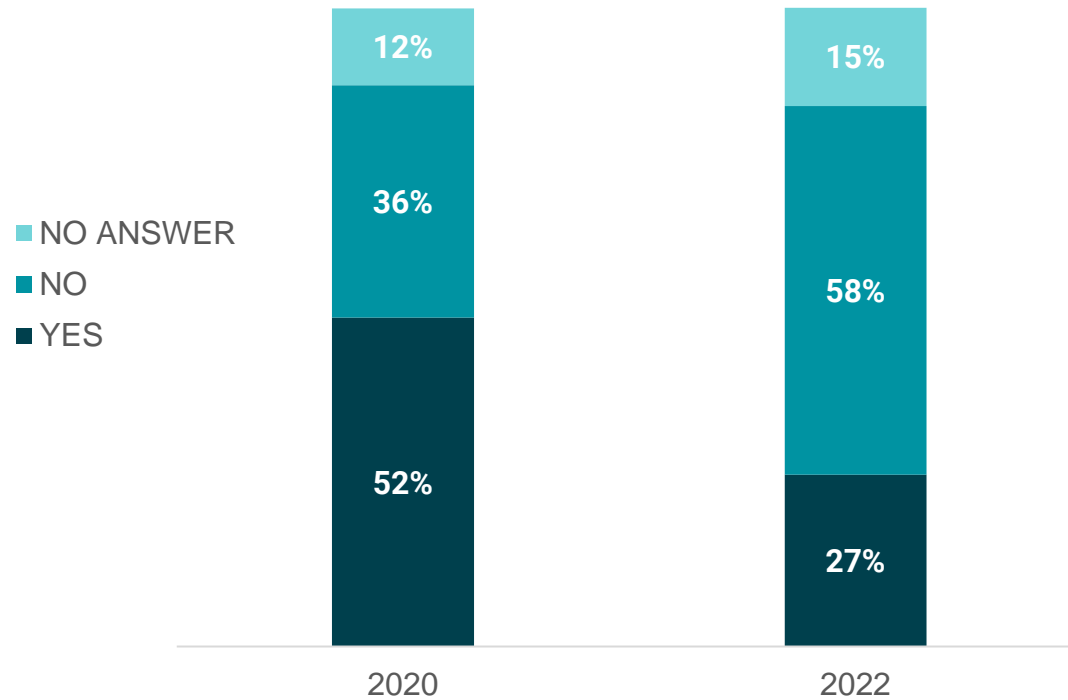
➤ In 2022 a higher number of companies thought that the **search for investors** was a major challenge.

Find the right investor for your project through the DG Radar.

[FIND OUT MORE](#)

Development of Centralized Generation (CG) Projects

Aside from DG Remote Generation Projects, does your company also develop CG solar plants ?



- ▶ **27 %** of surveyed companies confirmed that they **also develop Centralized Generation PV projects.**

Access the Strategic Report on Centralized Generation.

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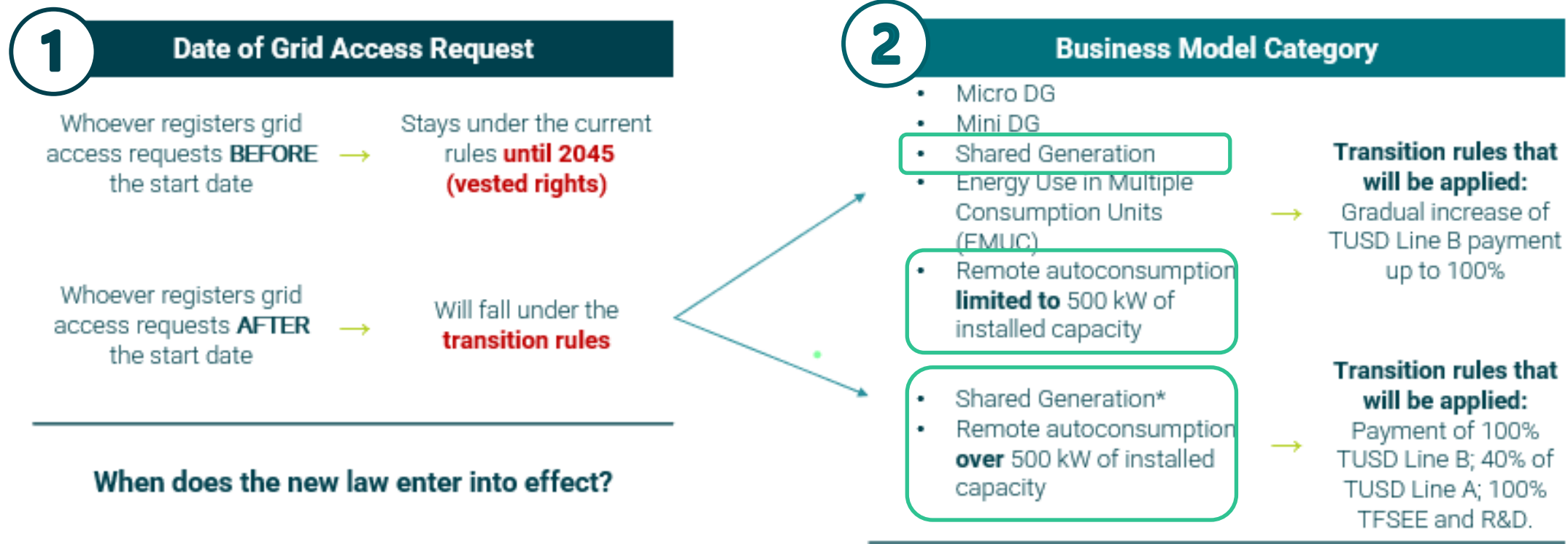
CHAPTER 3

Regulatory Context

Law 14.300

Transition Rule: Compensation for Credits under Remote DG

➤ The transition to the new rule will depend on two principal factors:



When does the new law enter into effect?



*Shared Generation in which one single owner/beneficiary possesses more than a 25% participation in the surplus production of electricity.

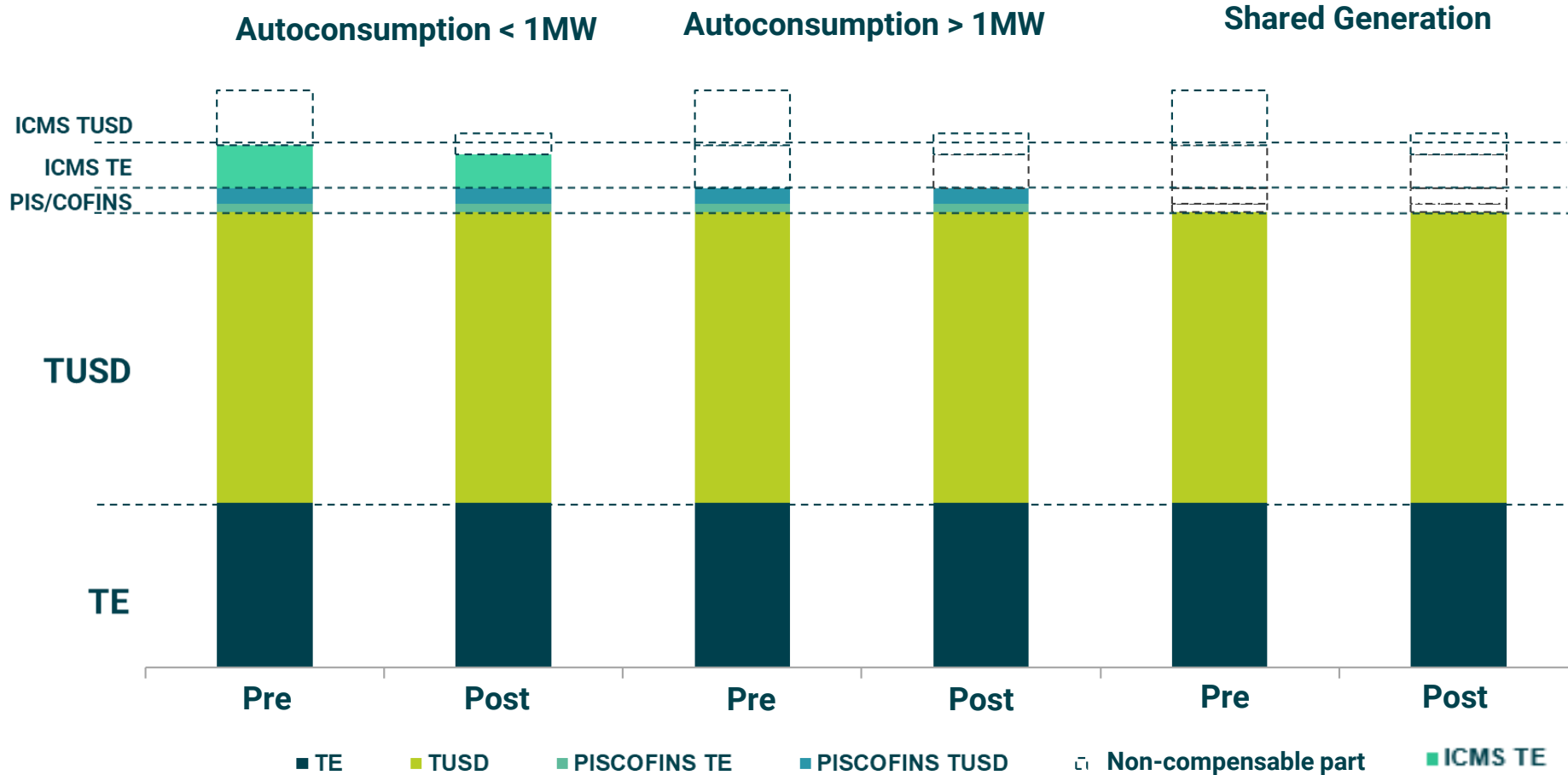
Complementary Law LC 194 (ICMS/VAT)

Alterations and Impacts on DG

	Alteration	Impact	Result
National Tributary Code	<ul style="list-style-type: none">• Energy and other essential and indispensable goods and services.• Prohibited to charge ICMS rates at a higher rate than that is charged to general operations.	<ul style="list-style-type: none">• Upper Limit to ICMS charged on energy at 17% or 18%, depending on the State.	Reduction of the energy price (incl taxes)
Kandir Law	<ul style="list-style-type: none">• Art. 3: The tax (ICMS) will not be levied on: X- Transmission and Distribution Services for electrical energy and sector surcharges related to those operations.	<ul style="list-style-type: none">• Reduction of the calculation basis of ICMS.• No levy of ICMS over contracted demand.	

Complementary Law 194 (ICMS / VAT)

Compensatable Portion of Energy (General Rule)



➤ Despite the reduction in energy prices caused by LC 194, the compensatable portion is reduced only in the case of remote auto-consumption < 1 MW, and remains constant in the other examples.

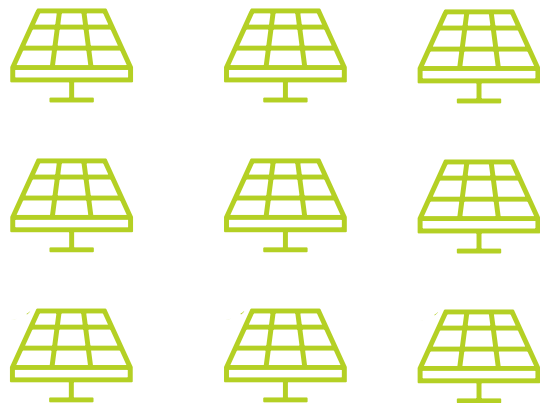
➤ The non-compensatable portion is reduced in all cases.

CHAPTER 4

Viability Analysis

Cases: Shared Generation and Remote Auto-consumption

This chapter contains modeling for three hypothetical cases of PV Plants operating under the shared generation and remote autoconsumption models. There will be an evaluation of **Internal Rates of Return (IRR) per State**, comparing the financial attractiveness of such PV investments **pre- and post- Complementary Law 194** (published on 23/6/2022), which established the use of minimum ICMS rates (17% or 18%) for essential products and services, such as is the case with electrical energy.



Simulations were carried out for PV plants in **each State of Brazil**, with a hypothetical location.

Case 1: Remote Auto-consumption Mini DG 300kW

Assumptions

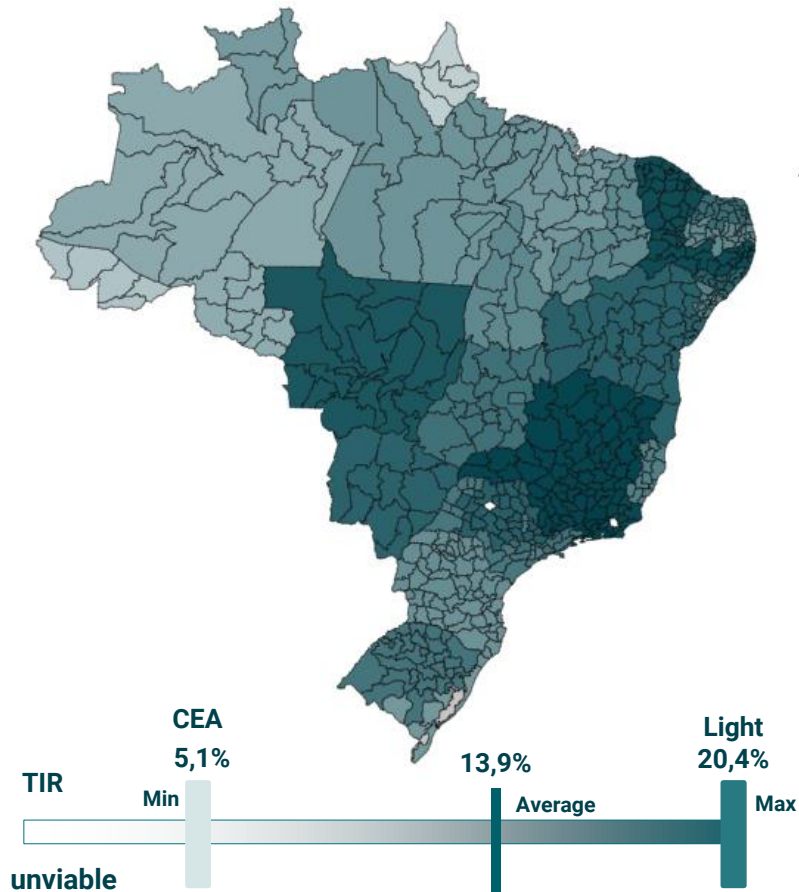
- The chosen business model is **leasing for remote auto-consumption** for a PV plant with installed capacity of **less than 1MW**.

Characteristics of the PV Plant	
Installed Capacity (AC)	300 kW
Installed Capacity (DC)	390 kWp
Structure	Fixed Ground-Based
Financial Characteristics	
CAPEX	4.14 R\$/Wp
OPEX	2.5% of CAPEX p.a.
Inflation Readjustment	4% p.a.
Annual Energy Price Adjustment	6% p.a.
Customer Receiving Energy Credits	Commercial (B3)
Discount Conceded	15% of Price without Surcharge
Connection Costs	R\$ 0
Chosen Location	City in the 90th percentile for solar productivity within the distributor's concession area

Viability Analysis

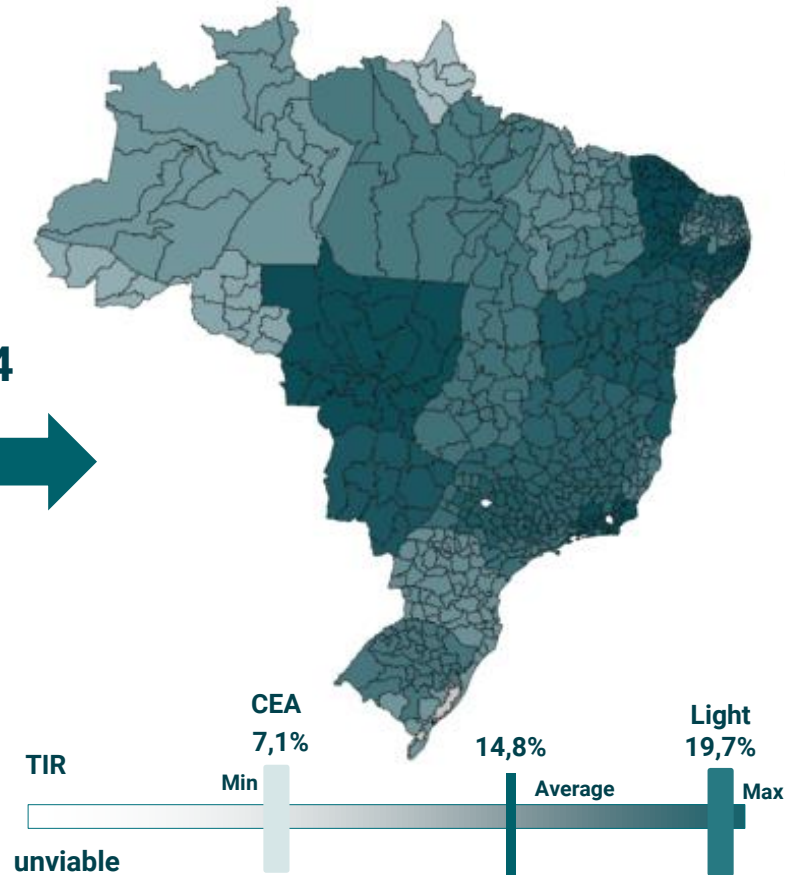
Before and After LC 194 – Vested Rights according to Law 14.300

Vested Rights – Pre LC194



Vested Rights – Post LC194

LC 194
➔



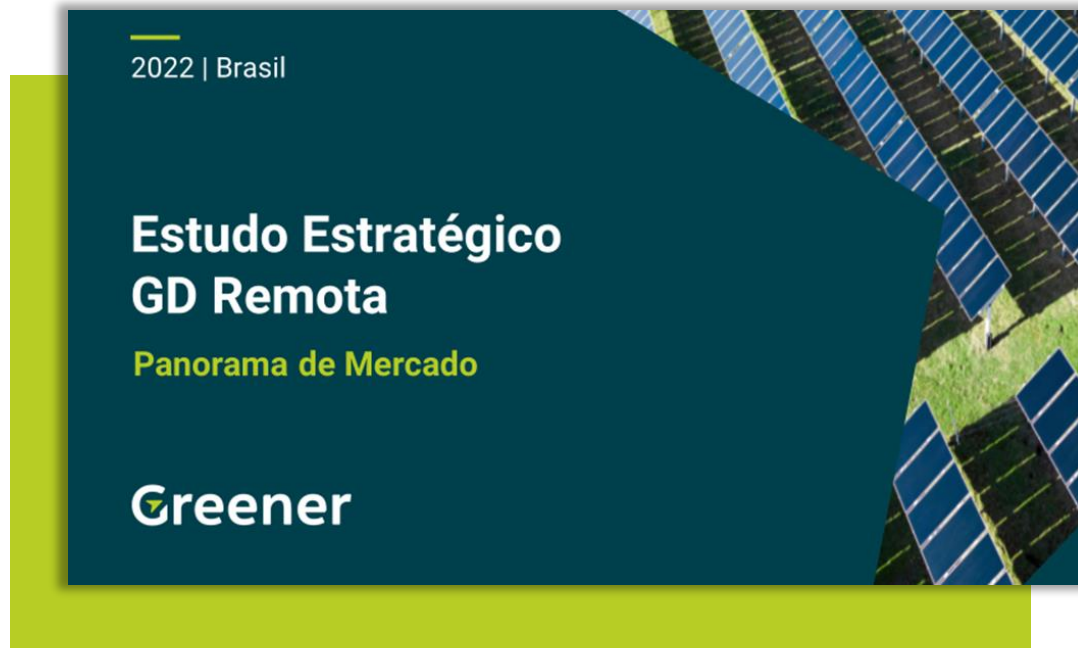
- Despite the reduction of the compensatable portion of the energy price, in general there is an increase in profitability of the PV projects.
- This is true except for in a few cases (notably RJ), where the reduction in the ICMS rate to be charged results in a big decrease in the compensatable rate and therefore a drop in project revenues.

CHAPTER 5

Conclusions and Insights

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We would like to establish a pathway to 2050 with one clear objective: reach Net Zero emissions globally. We want to give the gift of a sustainable future to the coming generations, leaving behind the ecological debt that we have created. For this reason we emphasize our commitment to the #EnergyTransition, adapting all our activities in line with the core requirements for a successful switch: decarbonization, electrification, energy efficiency and digitalization.

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Valmont Solar has more than 75 years as a global infrastructure manufacturer and 15 years of technical experience in renewable energy generation. The Single-Axis Solar Trackers feature a streamlined design that minimizes installation time and labor costs, while increasing generation by up to 25% compared to fixed-tilt systems.

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