Brazil solar energy for businesses

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The impact of global warming is becoming apparent across the globe, and the conflict in Ukraine has added a new layer to this emergency - global energy security. Despite this urgency, humankind"s ability to reduce greenhouse gas (GHG) emissions remains largely unproven.

To limit global warming by 2050 to about 1.5?C (McKinsey estimates the best feasible result is a 1.7?C increase), humanity needs to scale a major global effort to transition the global economy to sustainable energy and materials, and complement this activity with carbon capture, use and storage (CCUS) at scale.

This effort now has nations that account for over 95% of the global GDP committed to achieving net-zero emissions, and almost 3,000 organizations have signed on to the Science Based Target Initiative (SBTi), founded in 2015 to help companies set their emission reduction targets in compliance with climate science. McKinsey estimates this will require USD 3-5 trillion in investments per year until 2030 - the largest capital relocation in human history - and different parts of the world will play different roles.

Brazil can play a much larger role in this transition, given its natural resources and capabilities. McKinsey has mapped three avenues associated with the green economy in which Brazil can take a leading global role: renewable power, biobased energy and materials, and carbon markets. Together, these avenues represent a market of over USD 125 billion (Exhibit 1). They can also deliver numerous other direct and indirect benefits, such as socioeconomic development, improved water security and biodiversity protection.

Therefore, beyond being an agricultural powerhouse, with 27% of the country"s GDP in 2021 in this sector and a prominent role in feeding the global population, Brazil has a unique opportunity to accelerate sustainable inclusive growth while taking a leadership role in the decarbonization of the global economy.

Biomass use is another major opportunity and has three main applications. First, to expand the use of biofuels for aviation or as a replacement for diesel. Second, to develop the biomethane industry, and third, to use biomass for steel production and other high-temperature processes.

Brazil is well-positioned to become the world's largest sustainable fuel producer. Elements of this transformation include the use of "residues," such as sugarcane vinasse, as well as the use of soybean oil, and specialized crops, such as maca?ba (which can grow on degraded pastureland). By 2040, Brazil could capture a market of up to USD 40 billion without putting its agricultural production at risk.

Brazil's biomethane market value could reach USD 15 billion by 2040, taking advantage of waste and by-products from five main industries: sugarcane, cattle ranching, dairy farming, pork raising, as well as urban waste and sewage. Biomethane is produced via anaerobic digestion and can be used in four main applications: heating or electricity for self-consumption, electricity for sale to the grid, renewable natural gas for sale, and

renewable natural gas for transportation. The key factors for deciding which application makes the most sense are location and production volumes.

Brazil"s potential for commercial forestry is widely known and exploited by the pulp and paper industry. But the use of biomass as a substitute for coal has great potential in steel-making and other processes that require high-temperature heat, such as pelletizing and clinker production for the cement industry. In the steel value chain alone, the biomass market could reach its full potential of USD 3-4 billion as soon as 2030, staying at this level until 2040. The main restrictions are the growth cycle of the eucalyptus plant and the installation of the continuous carbonization furnaces needed for quality biomass.

Finally, besides extensive forests, Brazil has about 15% of the potential to abate or sequester carbon from the atmosphere using natural climate solutions. In fact, the country has the greatest potential worldwide. These solutions, for example, involve the preservation and restoration of biomes and the improved capture of carbon in the soil by agriculture; initiatives that can be structured via voluntary carbon credits. In addition to bringing important benefits like increased biodiversity and greater water security, this market could reach USD 15 billion in 2030 and USD 35 billion in 2040.

The green economy has the potential to attract significant investments to the country, fostering sustainable inclusive growth. At the same time, it will allow Brazil to collaborate significantly with the process of decarbonizing the global economy. It is probably the opportunity of the age.

The share of solar and wind in the installed power generation capacity of Brazil will likely grow to 47%, surpassing hydro, fossil, and biomass sources. This has a potential market of up to USD 11 billion in 2040. Three main factors will drive this growth. The first is economic attractiveness as the costs for energy generation and required capital continue to decrease as productivity, scale and technological development evolve. Our projections show that by 2040 there will be an up to 46% reduction in the levelized cost of energy (LCOE) for solar generation and a 27% reduction for wind generation (Exhibit 2).