

Factsheet:

Policy and market landscape for consumer renewable energy

Colombia Market Maturity¹-

- Solar PV: **HIGH**
- EV: **MED/HIGH**
- Flexibility/integration : **LOW**
- Mechanisms to increase RE investment: **MED**
- Consumer Advice Availability : **HIGH**²
- Incentives: **HIGH**

Overview

- **Market:** Utilities market (100+ companies) operates on supply and demand, overseen by XM, the Manager of the Commercial Exchanges System and System Operator) for regulatory compliance. Leading companies (see list below) cater to high-demand. Colombia's massive motorcycle market (10.9 million) offers a significant opportunity for electric motorcycles, as only 0.3% are electric currently.
- **Policy:** NDC aims to cut emissions 51% by 2030, but falls short to limit warming to 1.5°C (below 3°C). Colombia has specific regulations for electromobility, including vehicles and charging infrastructure (Decree 948, 697 and PND 2022-2026 National Strategy of Electric Mobility). Incentives include Law 1964 of 2019 establishes incentives for zero-emission vehicles (0% import duty and 5% VAT).
- **Permitting Levels to Feed into the Grid:** Under regulation CREG 135 (2021), small-scale self-generators are allowed to net metre/balance electricity. If excess energy/credits are generated, marketers are obligated to purchase it at spot price, which is approx. 40% of the final energy rate. There is no Feed-in-Tariff (FIT).
- **Virtual Power Plants (VPPs):** Colombia is rapidly advancing in various options for energy purchase mechanisms, allowing users to choose their energy supplier instead of being tied to a specific marketer. This competition is helping innovation in utility business models.

Leading Companies in these Markets

1. **Solar Energy and Renewable Sector:** Celsia, Epm, Enel Colombia S.A. E.S.P, Grupo Solari Se Sas, Edpr, Solarpack, Latam Fotovoltaica, Sahagún Sas, Aes Colombia & Cía. S.C.A. E.S.P, Latamsolar Colombia Sas.
2. **Electric Vehicle (EV) Charging Market:** ChargePoint, Enel X, Wallbox (Electric mobility), SIEMENS (Energy management and charging infrastructure), Dielco (Electrical materials distributor), EVECTRA (Charger manufacturer), Evsy (Charger manufacturer), Plugshare (App-based mobility service provider).
3. **Smart Grid and Demand Response:** Schneider Electric, Siemens Smart Infrastructure.
4. **Utilities (with potential renewable energy interest):** Empresas Públicas de Medellín (EPM), Grupo Energía Bogotá (GEB), Isagen and Ecopetrol.
5. **Other Companies to consider:** Vanti, Afinia, Air-e, Compañía Energética de Occidente (CEO), Oasis Group, Empresa de Energía de Pereira EEP (MEEP), AES COLOMBIA, , Grupo ISA, Urrá, Prime Energía, Vatia and EDPR.

Electricity Market and Contract Prices (2022)

Average Price: Regulated contracts - 279.07 COP/kWh, Unregulated contracts - 259.48 COP/kWh. These tariffs correspond to the generation component which represents approx. 40% of the total tariff. In December 2022, the electricity tariff increased 30% due to La Niña phenomenon.

1. Comparison based on the LATAM region

2. Ministry of Environment center, UPME, ANDI, CAM, CAR, CECODES, Local governments etc.

Electricity Prices (October 2023):

- Generation Cost: 375 COP/kWh (48% of total unit cost).
- Total Unit Cost: 785 COP/kWh (0.198 USD/kWh)

Fuel Costs (January 2024):

- Diesel: 0.61 USD/Litre
- Gasoline: 1.03 USD/Litre



Demand Side response/Flexibility:

The adoption of a smart grid system could save up to \$730 million annually by 2040 and reduce CO₂ emissions by 4.5 Mton by 2030. Plans are in place to install 11 million smart metres by 2030, covering 75% of electricity users (subject to congressional approval).

Smart Metre Rollout:

In Colombia, the expansion of electric metres, particularly smart metres, is ongoing. As of March 2024, there are approximately 450,000 smart metres installed across the country. The goal for 2030 is to have at least 75% of users connected to the National Interconnected System, roughly 14.5 million users, equipped with smart metres in their homes. This initiative is part of a national plan to enhance efficiency in the electricity sector. Barriers include the cost of the metres, to be borne by the final consumers as well as unclear laws and use of the data generated by these systems.

Assembly and Manufacturing

Colombia's solar panel market primarily focuses on assembly of imported components, with limited domestic manufacturing (e.g. THERMOWIRE Ltd). This approach leverages existing industrial capabilities while capitalising on competitive pricing from China. International brands are also present, offering broader solar energy solutions beyond just solar panels.

Factors Affecting Electricity Prices and Energy Generation

Rainfall and Renewables: Increased rainfall is associated with a greater use of renewable energy, which can positively impact electricity costs. However, drought conditions pose risks to how clean the electricity system is.

Annual Growth: Electricity tariffs have experienced an average annual increase of 10% (ranging from 2% to 17%).

Cost Drivers: Depreciation of the peso, high fuel costs, and environmental factors are the main drivers of price increases.

Hydroelectric Power: Approximately 80% of Colombia's energy comes from hydroelectric plants.

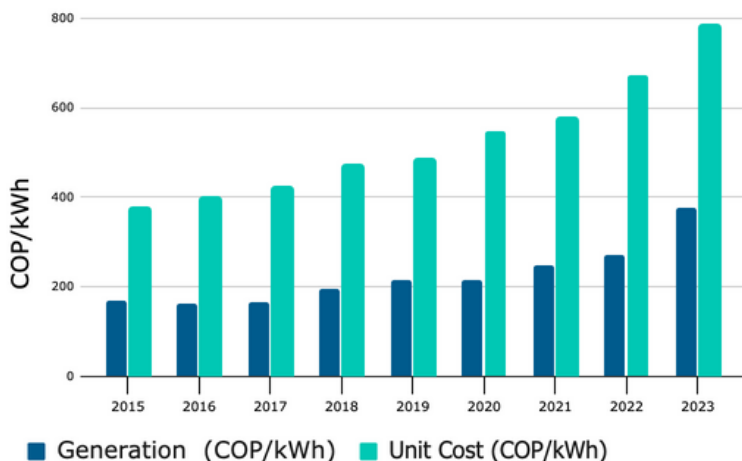


Figure 1. Increasing cost and generation: Significantly rising since 2015, from 168.3 COP/kWh to 272.3 COP/kWh in 2022. Similarly, the unit cost rose from 376.66 COP/kWh in 2015 to 772.12 COP/kWh in 2023 (COP = Colombian Peso).