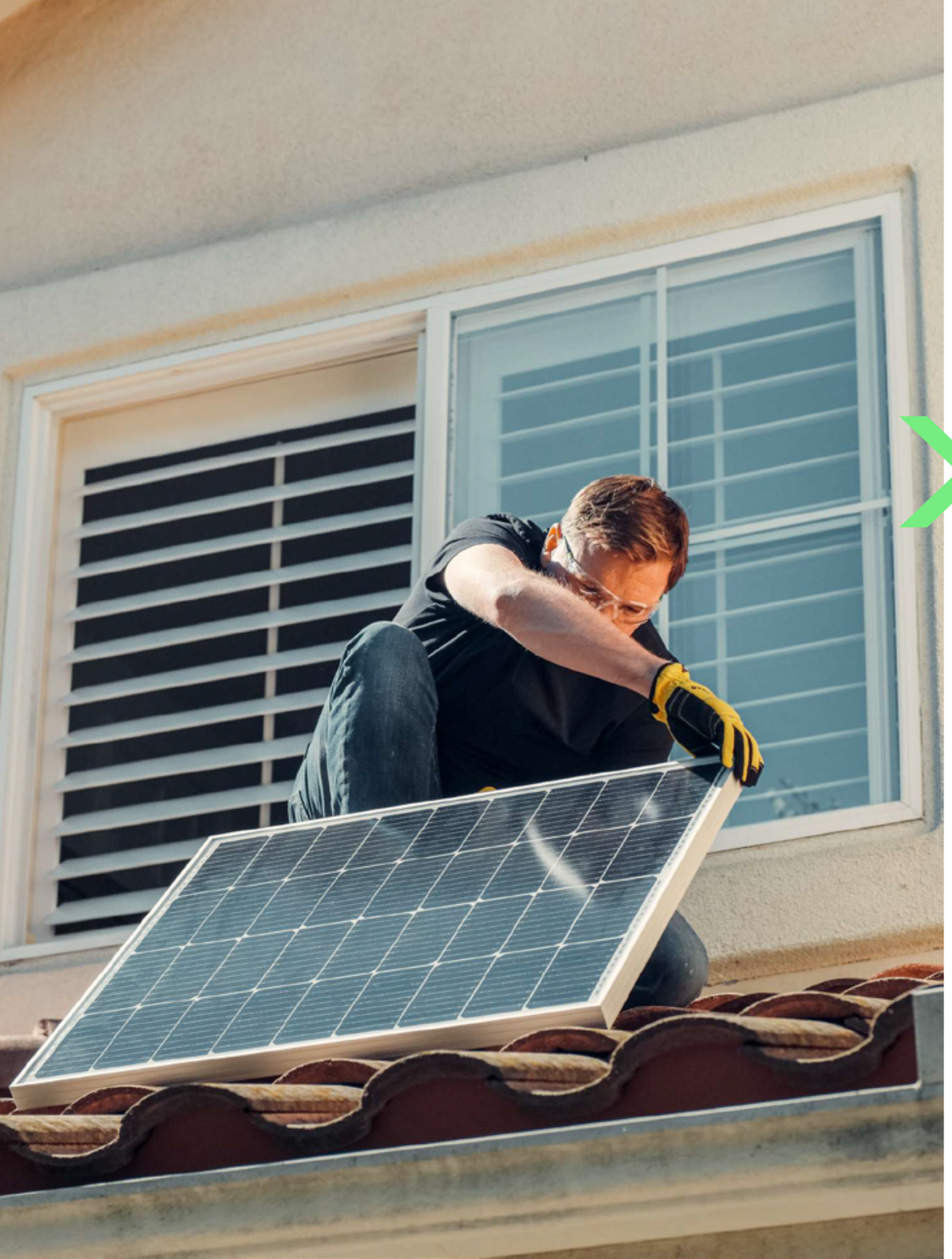

Ceiba Case Study

Ceiba Builds Custom Green Energy Tracking Platform Using **Blockchain**

epm®

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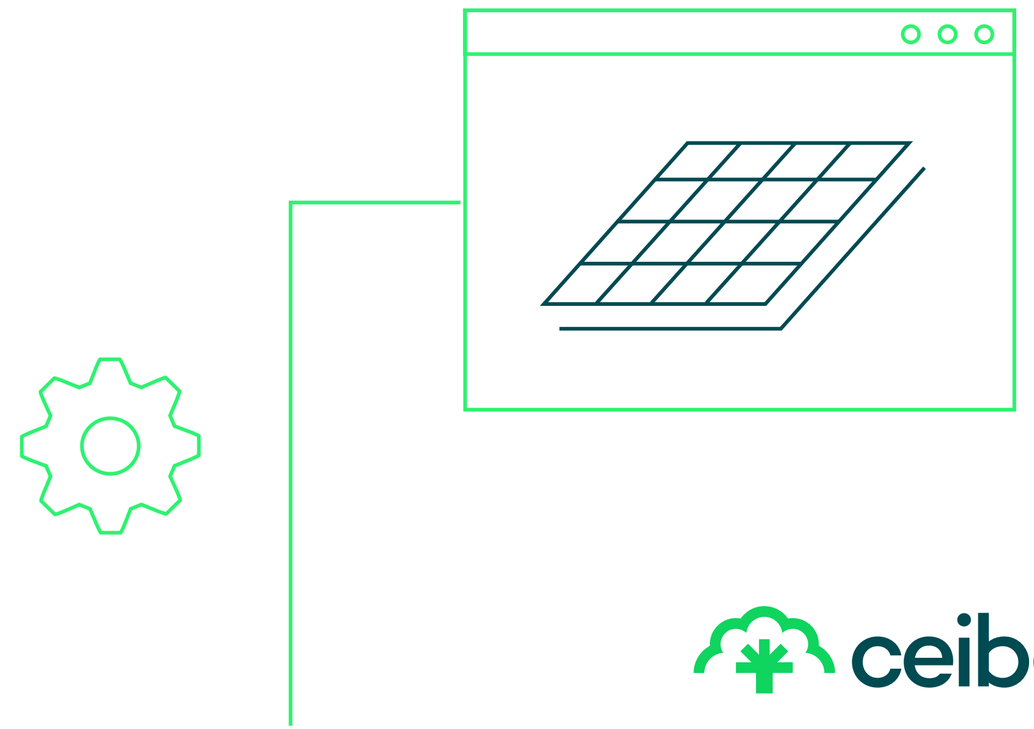
Introduction

In 2018, the Energy and Gas Regulatory Commission (CREG) of Colombia issued a regulation allowing for the small-scale purchase and sale of energy. The new energy rules represent a green energy milestone in Colombia. However, it also presents a significant challenge for energy service providers as users begin to participate in energy production, necessitating new business processes.

Initially, the management was purely manual, meter readings consisted of field visits using a third party, however, this caused delays and reprocesses in the collection of information, thus hindering the subsequent compensation for payment settlement.



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Colombia’s Largest Energy Company Contracts Ceiba to Build Intelligent Platform for Energy Generators

EPM reached out to Ceiba to help build an integrated, intelligent platform that would meet regulatory requirements and incorporate the first group of 850 small-scale energy generators in the country.

The platform needed to measure and collect energy production and usage data, integrate with existing client applications, and allow for billing and payment settlement.

The platform that Ceiba built did that and more.

Platform features:

- 850+ self-generators registered.
- Hourly measurement of energy consumption and generation through smart meters.
- Billing and compensation.
- Integrates with EPMs existing applications.
- Provides energy predictions based on historical demand and smart meter data to drive decision making.

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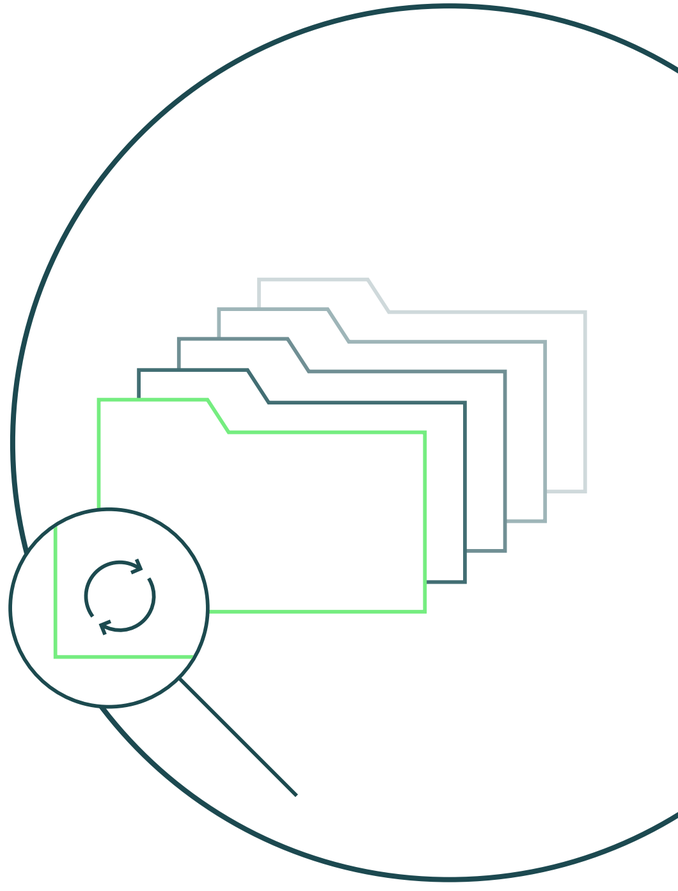
The Technology Making the Auto-Generators Platform Possible

The Self-Generator Platform is composed of decoupled modules that interact with each other asynchronously, relying on Azure Cloud messaging services. The platform also incorporates the following methodologies and technologies:

- IoT – Coordinates data acquisition from meters.
- Blockchain – Ensures immutability of the data collected through the smart meters
- Analytics and AI – Includes anomaly detection analysis, measurement complement and machine learning models for supply and demand prediction clusters.
- Azure Kubernetes
- Azure SQL
- Service bus topic
- Cosmo dB
- Machine Learning
- Batch account
- IoT
- Log Analytics
- Azure monitor
- Event grid



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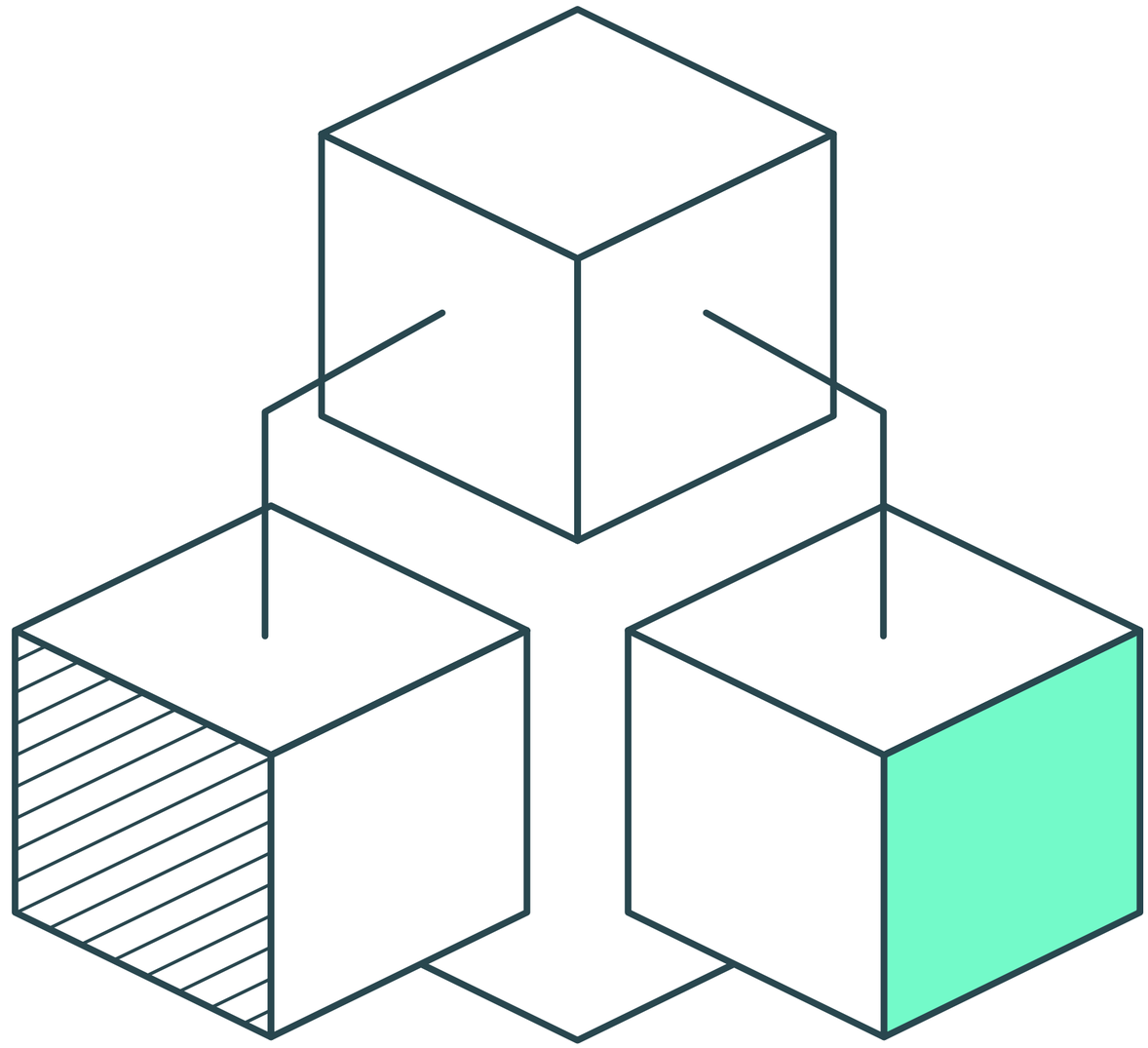
- Integration layers connect to EPM's core systems.
- Smart metering.
- Cloud-native architecture.
- Blockchain ledger that records the amount of energy generated.

- Analytics model that calculates the price per KW/hour paid to self-generator based on time of consumption.
- Easy-to-use, intuitive energy metering system.

It solves business problems by building a digital foundation, which will increase operational efficiency, improve resource optimization, and allow EPM to continue to be considered as a leading company in the sector in the country.



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