



# Blockchain WebApp for Ecohotel Pomelia

Welcome to our presentation of the Blockchain WebApp for Ecohotel Pomelia. Our solution allows for the accurate tracking of energy produced and consumed by solar panels, utilizing Django, Redis and the Ethereum Goerli Testnet Blockchain.

by Emanuele Bashuri

# Overview

## 1 Goal

To create a WebApp that tracks the energy produced and consumed by solar panels of Ecohotel Pomelia.

## 2 Why

To increase the transparency and accuracy of energy data and reduce human error or fraud.

## 3 How

Utilizing blockchain technology and an intuitive WebApp interface for Ecohotel Pomelia employees and management.

## 4 Benefits

Improved data security, lower costs, and more informed business decision making.



# Introduction to Blockchain Technology

## Explanation

Blockchain is a decentralized digital ledger that records transactions across a network of computers. It is secure, transparent, and tamper-proof due to the use of cryptographic algorithms.

## Features

Decentralization, immutability, transparency, security, and speed.

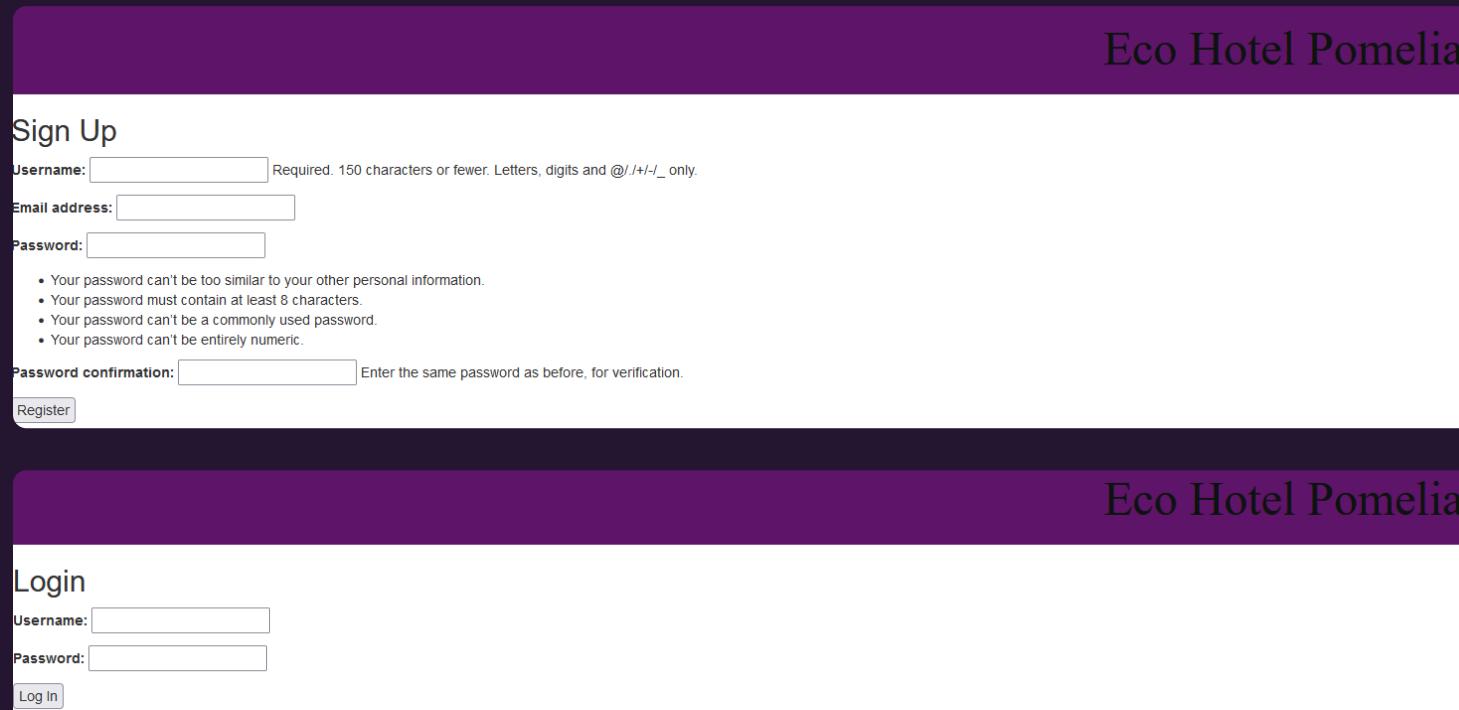
## Use cases

From banking and finance to healthcare and supply chain management, blockchain technology is transforming industries and processes.

# How Our WebApp Works

## 1 Registration & Login

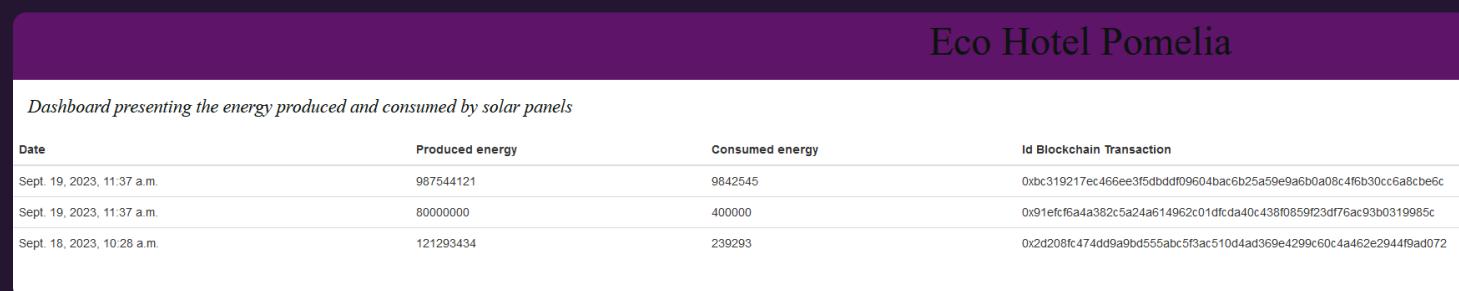
Ecohotel Pomelia employees can easily create a secure account and access the WebApp to view energy production and consumption data.



The image contains two screenshots of the 'Eco Hotel Pomelia' web application. The top screenshot is titled 'Sign Up' and shows fields for 'Username', 'Email address', 'Password', and 'Password confirmation'. It includes a note about password complexity: 'Your password can't be too similar to your other personal information.', 'Your password must contain at least 8 characters.', 'Your password can't be a commonly used password.', and 'Your password can't be entirely numeric.' The bottom screenshot is titled 'Login' and shows fields for 'Username' and 'Password', followed by a 'Log In' button.

## 2 Homepage

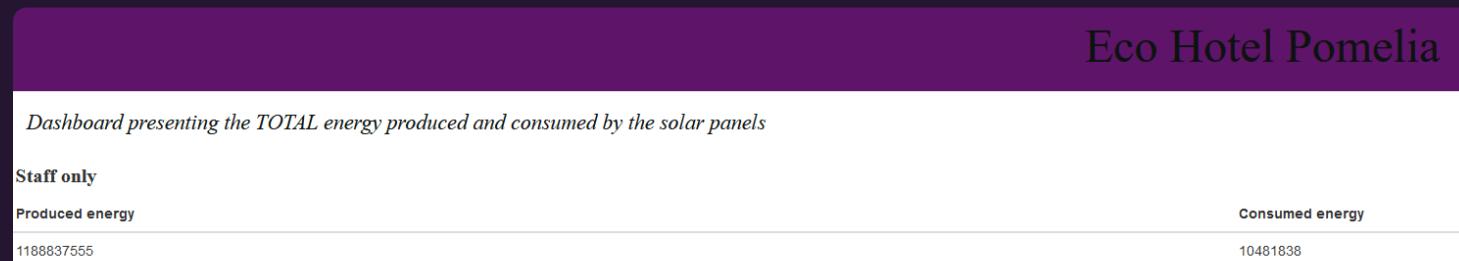
A user-friendly dashboard available only to logged-in users, displays important information such as energy produced, consumed, and the related id to the transaction on the Ethereum Goerli Testnet Blockchain.



Date	Produced energy	Consumed energy	Id Blockchain Transaction
Sept 19, 2023, 11:37 a.m.	987544121	9842545	0xbc319217ec466ee3f5d0dddf09604bac6b25a59e9a6b0a08c4f6b30cc6a8cbe6c
Sept 19, 2023, 11:37 a.m.	8000000	400000	0x91efcf6a4a382c5a24a614962c01dfcd40c438f0859f23d76ac93b0319985c
Sept 18, 2023, 10:28 a.m.	121293434	239293	0x2d208fc474dd9a9bd555abc5f3ac510d4ad369e4299c60c4a462e2944f9ad072

## 3 Admin Area

A separate area for administrators displays the total energy produced and consumed.



Dashboard presenting the TOTAL energy produced and consumed by the solar panels	
Staff only	
Produced energy	1188837555
Consumed energy	10481838

## 4 IP-CHECK

A logging system was implemented with REDIS, a NoSQL database, to record the most recent IP address that accessed the platform for a specific admin user. It then displays a message with the current IP and the previous one.

```
[18/Sep/2023 10:24:05] "GET / HTTP/1.1" 200 968
[18/Sep/2023 10:24:07] "GET /accounts/login/ HTTP/1.1" 200 1139
ip_check: is different?: False
current: 127.0.0.1, last: None
[18/Sep/2023 10:24:15] "POST /accounts/login/ HTTP/1.1" 302 0
[18/Sep/2023 10:24:15] "GET / HTTP/1.1" 200 1298
[18/Sep/2023 10:28:45] "POST /record_data/ HTTP/1.1" 200 43
```

# POSTMAN App

## 1 What is POSTMAN

POSTMAN is an API development tool that simplifies the creation, testing, and documentation of APIs. We used POSTMAN to streamline the integration of our WebApp with the blockchain network.

## 2 Features

Easy-to-use interface and automatic error detection.

## 3 Benefits

Reduced development time and improved API quality.

## 4 How it works

Every 24 hours, data will be sent to the database via a POST request in JSON format to the /record\_data endpoint. This data will then be transmitted to the Ethereum Goerli Testnet blockchain through a transaction.

# Transaction Details + Benefits of Our Blockchain Solution

## Transaction Details

- One type of transaction that includes energy produced and energy consumed.
- Transactions are recorded to the blockchain network immediately and cannot be altered once recorded.

## Benefits

- Improved data accuracy and transparency.
- Decreased energy-related costs through increased efficiency and smarter energy management.
- Increased customer trust through the use of secure, tamper-proof technology.

## How it works

- Every piece of data is documented on the Ethereum blockchain goerli testnet, with the transaction ID visible on the web app's homepage. Using that ID on goerli.etherscan.io provides all transaction details.

The screenshot shows the Etherscan interface for a Goerli Testnet transaction. The transaction hash is 0xd2d208fc474dd9a9bd555abc5f3ac510d4ad369e4299c60c4a462e2944f9ad072. It was successful, occurring in block 9715722, which has 14 block confirmations. The transaction was made 3 minutes ago at Sep-18-2023 08:28:48 AM UTC. The method used was 0x66663363. The transaction originated from address 0x7717a3a6a4737Ea5DdE6cD6409C6f6B302222dDf and went to address 0x000. The value was 0 ETH (\$0.00), and the transaction fee was 0.00000000001805968 ETH (\$0.00). The gas price was 0.000000082 Gwei (82 wei).

Field	Value
Transaction Hash:	0xd2d208fc474dd9a9bd555abc5f3ac510d4ad369e4299c60c4a462e2944f9ad072
Status:	Success
Block:	9715722 (14 Block Confirmations)
Timestamp:	3 mins ago (Sep-18-2023 08:28:48 AM UTC)
Method:	0x66663363
From:	0x7717a3a6a4737Ea5DdE6cD6409C6f6B302222dDf
To:	0x000
Value:	0 ETH (\$0.00)
Transaction Fee:	0.00000000001805968 ETH (\$0.00)
Gas Price:	0.000000082 Gwei (82 wei)

# Potential Future Applications & Growth Opportunities

## Fitness Tracking

Track and monitor the health and wellbeing of guests through wearable technology and smart devices.

## Smart Room Control

Utilize IoT devices to create a more eco-friendly and efficient room environment.

## Energy Trading

Trade and sell excess solar energy to other businesses or even individuals via blockchain technology.

## Growth Opportunities

Expand the use of our WebApp to other sustainable businesses and potentially partner with larger energy companies or utilities.

# Thank You for Your Time Viewing Our Project!



## The Team(just me)

Thank you for learning more about our exciting project.

## Continued Innovation

We are committed to staying on the cutting edge of technology and finding new ways to create sustainable solutions.

## Join the Movement

We believe that the future is bright for sustainable energy. Contact us to learn more about how we can partner to make a difference.

Here is a link to see the repository of our project on GitHub:

[https://github.com/Kagutaku/Start2Impact-Ecohotel-Project\\_Django-Redis-Blokchain](https://github.com/Kagutaku/Start2Impact-Ecohotel-Project_Django-Redis-Blokchain)

and the online demo in PythonAnywhere:

<https://kagutaku.pythonanywhere.com/>

Those are the credentials to log in, in the website:

Admin User - Username: Admin | Password: 87654321Z

Normal User - Username: normal | Password 12a34b56c