



Energy Saving

BUILD IT RIGHT



BUILD IT RIGHT



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OUTLINE

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- 2-DATA AND FEATURES**
- 3-MODEL USED**

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Sustainability is central to Saudi Arabia's Vision 2030, aiming for Net Zero by 2060. The Kingdom is addressing energy and climate challenges with initiatives like the Circular Carbon Economy (CCE) and a diverse energy mix, targeting 50% renewable energy by 2030.





INTRODUCTION



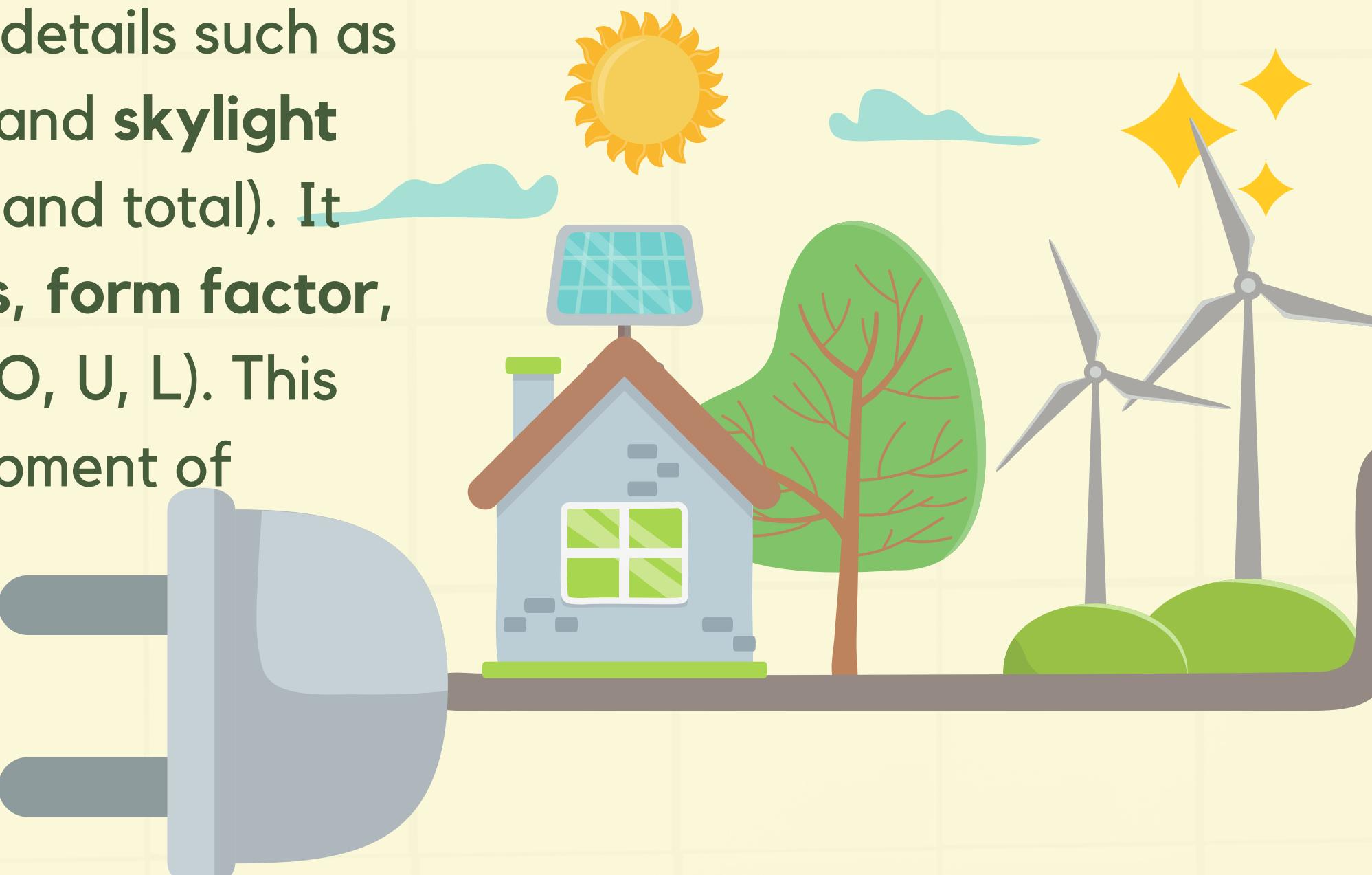
Build It Right (ابنيها صحيحاً) is a project focused on predicting optimal energy consumption and recommending materials for residential buildings. The goal is to enhance energy efficiency and sustainability in building design.





DATA AND FEATURES

The dataset, sourced from Singapore, comprises 15,357 entries with 15 columns. Each entry includes details such as **building dimensions, orientation, window and skylight ratios, and energy loads** (cooling, heating, and total). It also covers **building area, court dimensions, form factor, surface-to-volume ratio, and shape** (Box, O, U, L). This comprehensive dataset supports the development of energy efficiency recommendations.





MODEL OVERVIEW:





METHOD USED

DATA PREPROCESSING

Handled missing values, applied one-hot encoding, and managed outliers for data consistency.

MODELING

Tested Linear Regression, Random Forest, Gradient Boosting, and LightGBM. Used AutoML for optimization.

EVALUATION

Used MSE, RMSE, MAE, and R-squared to assess model accuracy.

DEPLOYMENT

Integrated the model into a Streamlit app with a user-friendly interface for input and recommendations.

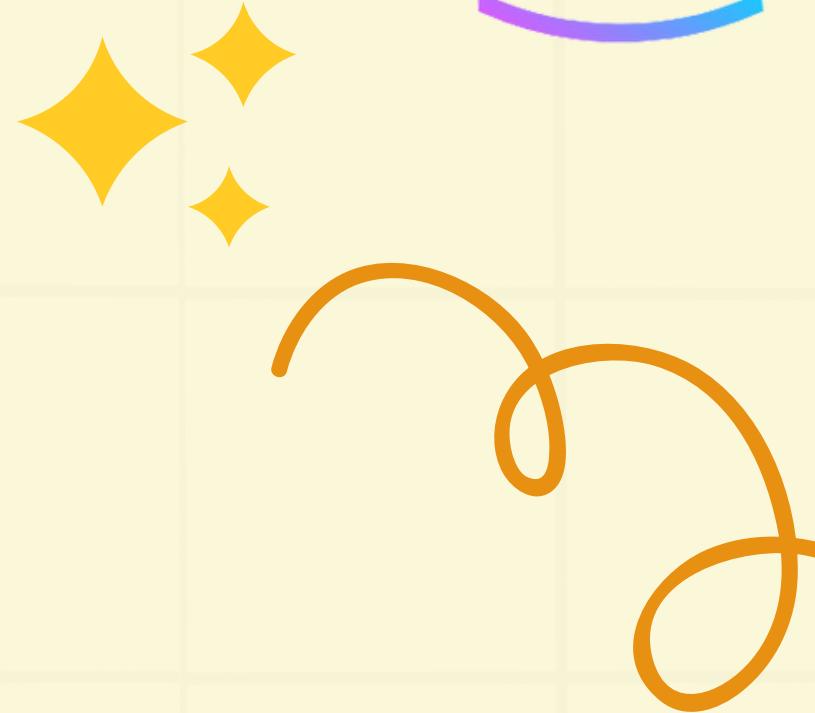




MATERIALS DATASET

Dataset used to implement this feature :

- 1. Effectiveness:** The ability of the material to insulate.
- 2. Installation Cost, time:** The cost involved in installing the material.
- 3. Maintenance Cost:** The cost required to maintain the material over time.
- 4. Lifespan:** The duration for which the material remains effective.
- 5. Application Areas:** The specific parts of the house where the material can be used (e.g., walls, roofs, ..)





MATERIAL RECOMMENDATIONS

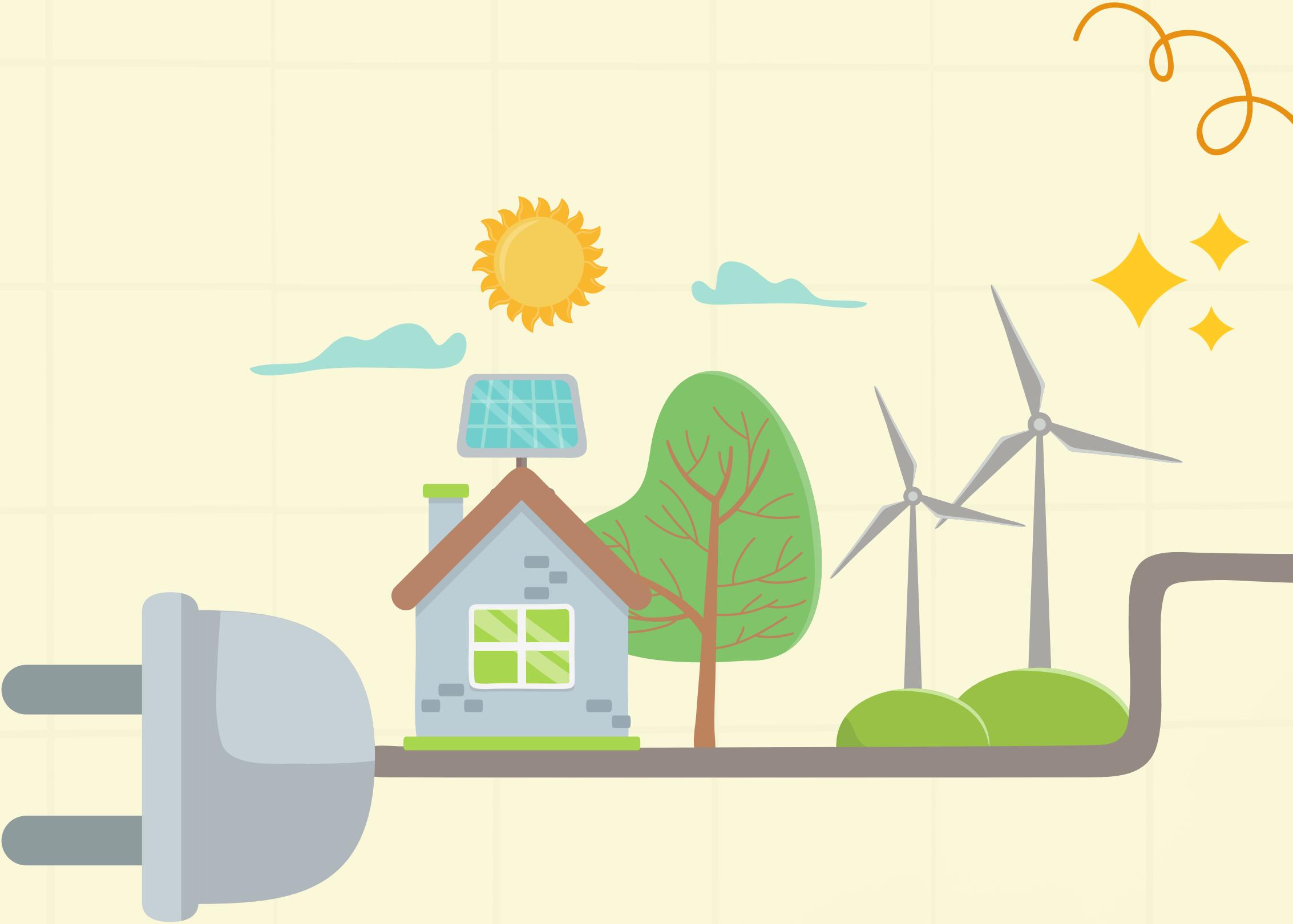


The system identifies the most effective materials that provide optimal energy efficiency and suggests the best materials that are cost-effective.





DEMO



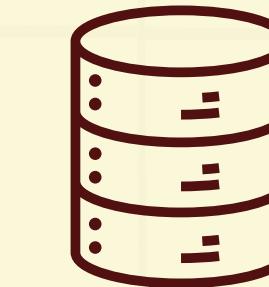


FUTURE ENHANCEMENTS



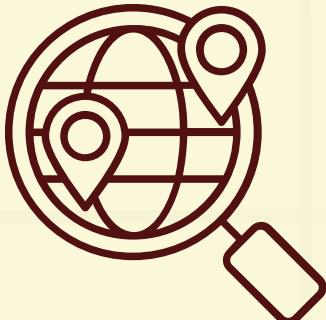
DATA EXPANSION

ADVANCED MATERIAL RECOMMENDATIONS INCORPORATE ENVIRONMENTAL IMPACT DATA TO RECOMMEND THE MOST SUSTAINABLE MATERIALS.



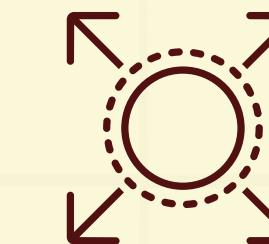
DATA DIVERSITY

CURRENT DATA LACKS DIVERSITY, LEADING TO HIGHER COOLING. THE AIM IS TO GATHER MORE DIVERSE DATA, INCLUDING DIFFERENT SEASONS AND ENVIRONMENTAL FACTORS.



LOCATION-BASED PREDICTIONS

ALLOW LOCATION INPUT FOR TAILORED RECOMMENDATIONS ON HOUSE SHAPE, ORIENTATION, AND MATERIALS.



PROJECT EXPANSION

THE CURRENT PROJECT FOCUSES ON BUILT HOUSES AND WILL EXPAND TO INCLUDE FUTURE CONSTRUCTIONS.

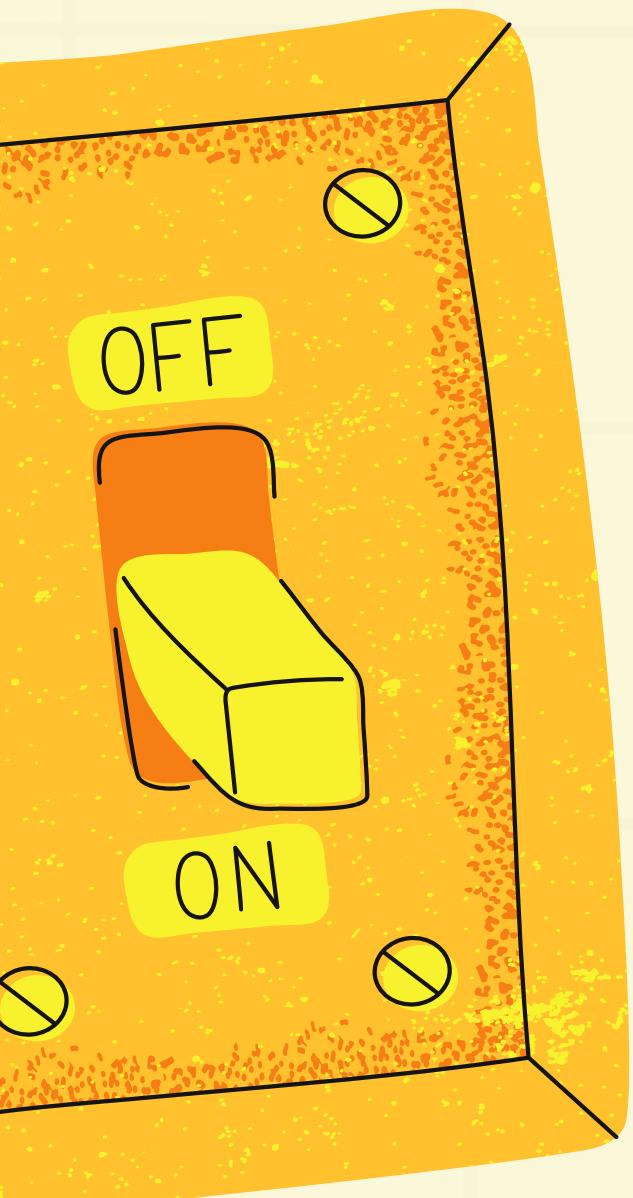


CONCLUSION

Build It Right (ابنيها صحيحاً) aims to enhance energy efficiency in residential buildings by predicting cooling and heating loads and recommending optimal materials. Our model helps users make informed decisions to reduce energy consumption and improve sustainability.



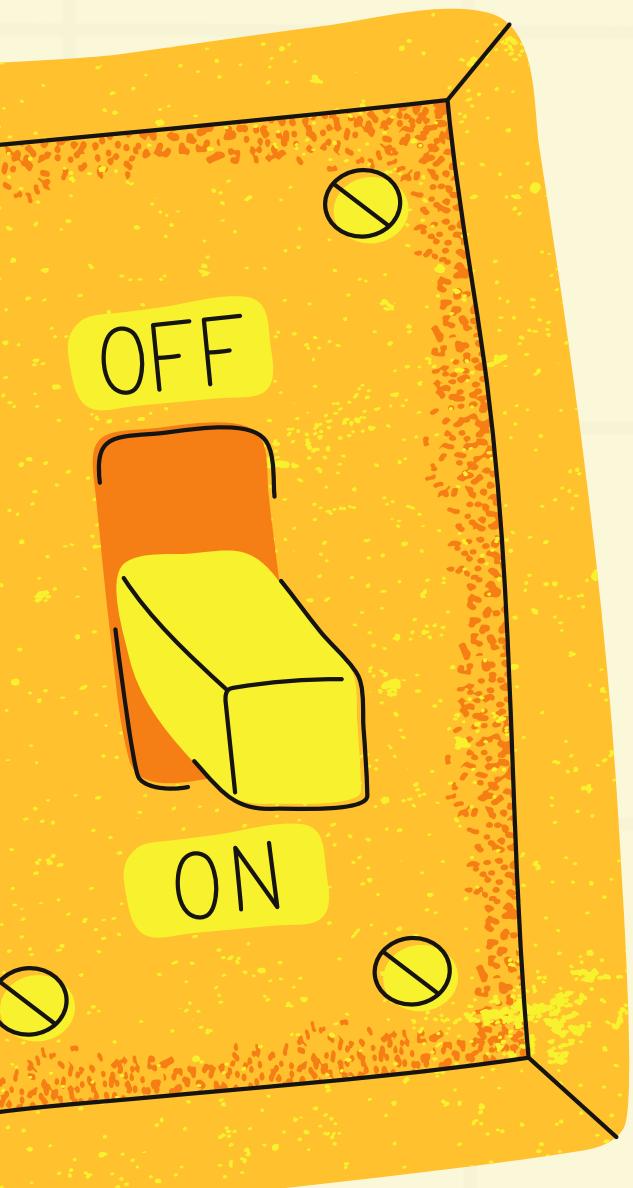
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**THANK YOU FOR
YOUR ATTENTION**

**and let's save energy together and
protect our earth!**





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