

# MEASURE ENERGY CONSUMPTION

## PHASE 2

Predicting energy consumption using machine learning involves using historical data on energy usage along with other relevant features to build a model that can make accurate predictions. The following steps outline the process:

### 1. Data Collection and Preparation:

- ⑩ Gather historical data on energy consumption. This can include information like date, time, weather conditions, building type, number of occupants, etc.
- ⑩ Clean the data to remove any outliers or missing values.
- ⑩ Preprocess the data, which may involve normalization, scaling, or encoding categorical variables.

### 2. Feature Selection:

- ⑩ Identify which features (independent variables) are most relevant for predicting energy consumption. This may involve using domain knowledge or employing feature selection techniques.

### 3. Splitting the Data:

- ⑩ Divide the dataset into training and testing sets. The training set will be used to train the model, while the testing set will be used to evaluate its performance.

### 4. Choosing a Model:

- ⑩ Select a suitable machine learning algorithm for regression tasks. Common choices include Linear Regression, Random Forest, Support Vector Machines, Neural Networks, etc.

### 5. Model Training:

- ⑩ Train the chosen model on the training data. During training, the model learns the relationships between the features and the target variable (energy consumption).

### 6. Model Evaluation:

- ⑩ Use the testing set to evaluate the model's performance. Common metrics for regression tasks include Mean Absolute Error (MAE), Mean Squared Error (MSE), and R-squared ( $R^2$ ) score.

### 7. Hyperparameter Tuning (Optional):

- ⑩ Fine-tune the model's hyperparameters to improve performance. Techniques like grid search or random search can be used.

### 8. Model Deployment:

- ⑩ Once the model performs satisfactorily, deploy it in a real-world setting. This could be as part of an application or integrated into an existing system.

9. **Monitoring and Maintenance:**

- ⑩ Continuously monitor the model's performance in the production environment. If the model's performance degrades over time, it may need retraining or adjustment.

10. **Predicting Energy Consumption:**

- ⑩ To predict future energy consumption, feed new data (e.g., current weather conditions, occupancy, etc.) into the trained model.