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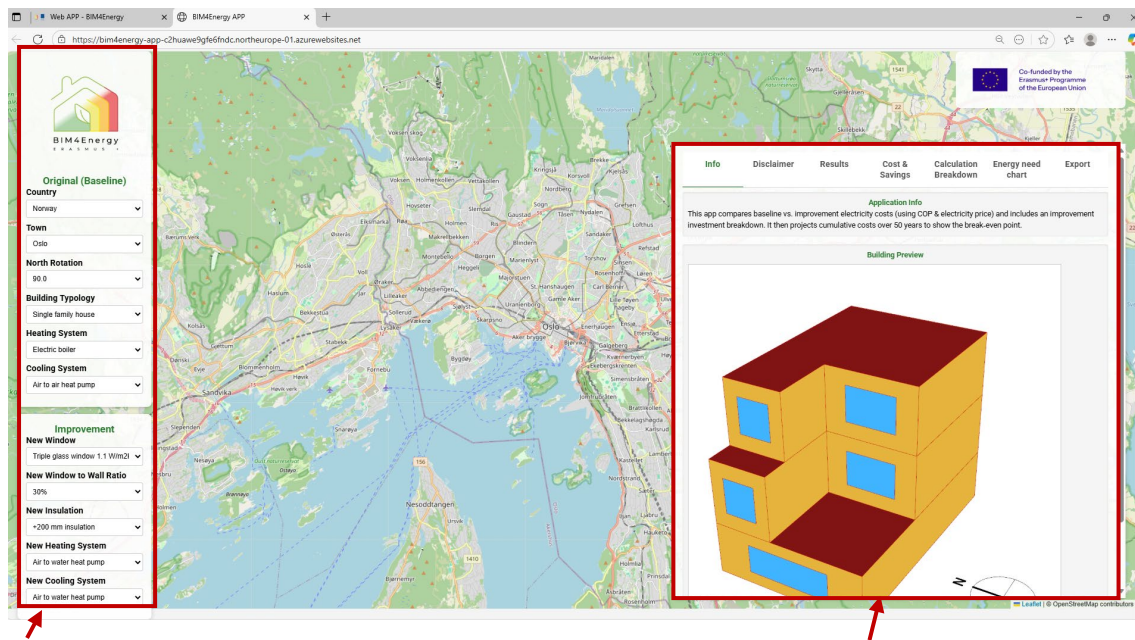
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BIM4Energy Project

BIM4Energy web app User Guide

Web APP - BIM4Energy

Interface:



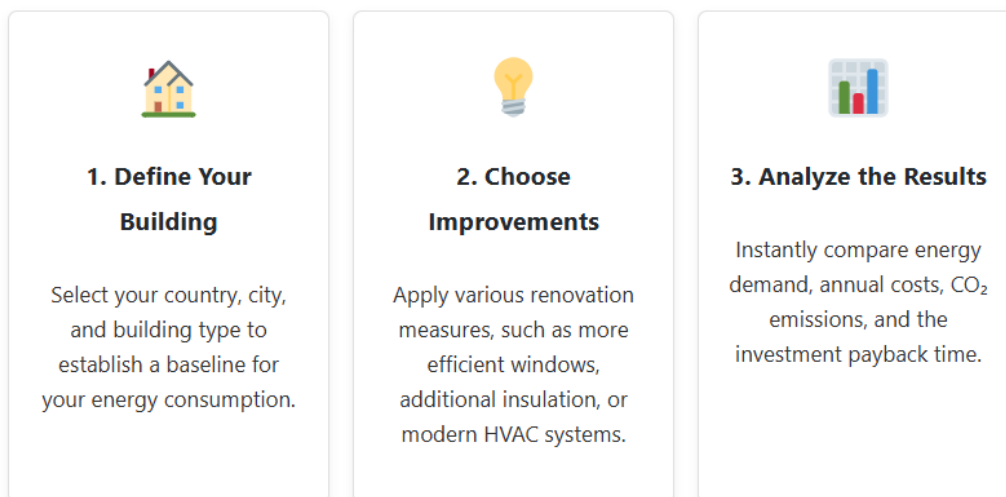
Inputs

Results

1- INTRODUCTION

Welcome to the BIM4Energy Calculator! This tool helps simulate the impact of energy efficiency improvements. Compare baseline vs. improved scenarios for energy, cost, and CO₂ savings.

How It Works



Our Purpose

The BIM4Energy Calculator is an initiative to democratize access to information about energy efficiency. Using data generated from advanced simulations with BIM (Building Information Modeling) methodology, our goal is to:

- **Empower** homeowners, managers, and students to make informed decisions about energy renovations.
- **Promote** sustainable construction and retrofitting by clearly showing the economic and environmental benefits.
- **Demonstrate** the power of BIM simulation to predict and optimize building performance.

Important Disclaimer




Please Note:

- This application is intended solely for **simulation and informational purposes**.
- All calculations are based on standard assumptions and AI-generated data. You can review the [technical assumptions](#) for details.
- The information provided **is not a substitute for advice from a qualified energy or construction professional**.
- BIM4Energy is not liable for any decisions made based on the results of this simulation.

Launch the Calculator

2- STEP-BY-STEP GUIDE

Inputs:



BIM4Energy
ERASMUS+

Original (Baseline)

Country
Norway ▼

Town
Oslo ▼

North Rotation
90.0 ▼

Building Typology
Single family house ▼

Heating System
Electric boiler ▼

Cooling System
Air to air heat pump ▼

Improvement

New Window
Triple glass window 1.1 W/m2l ▼

New Window to Wall Ratio
30% ▼

New Insulation
+200 mm insulation ▼

New Heating System
Air to water heat pump ▼

New Cooling System
Air to water heat pump ▼

Step 1: Select Location

- **Country:** Choose to load regional data.
- **Town/City:** Choose to set local climate and costs. Map updates automatically.

Step 2: Define Baseline Building

- **Typology:** Select building type (e.g., Single-family house). Preview image appears.
- **North Rotation:** Choose building orientation.

Baseline Results (heating/cooling demand) will appear.

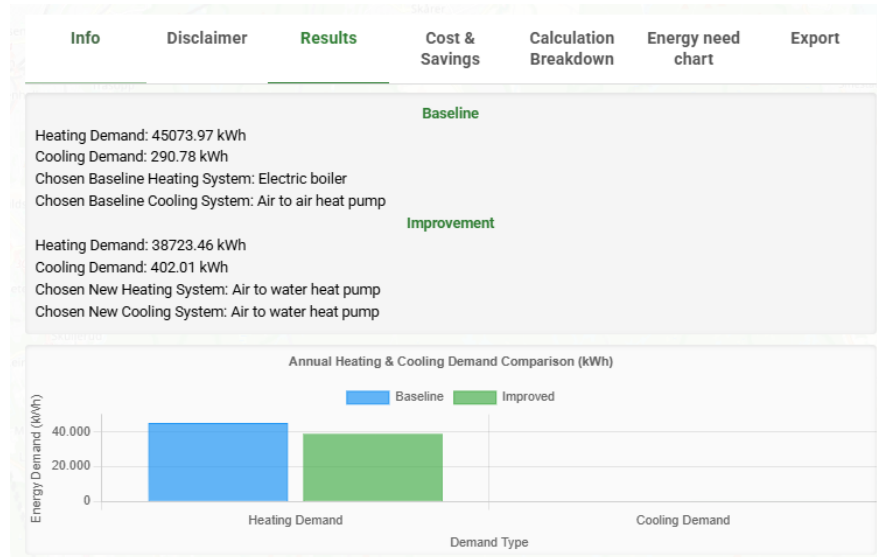
Step 3: Apply Improvements

- **New Windows:** Select efficient window type.
- **Window to Wall Ratio:** Adjust window area percentage.
- **New Insulation:** Choose insulation thickness.
- **New Heating/Cooling System:** Select efficient HVAC systems.

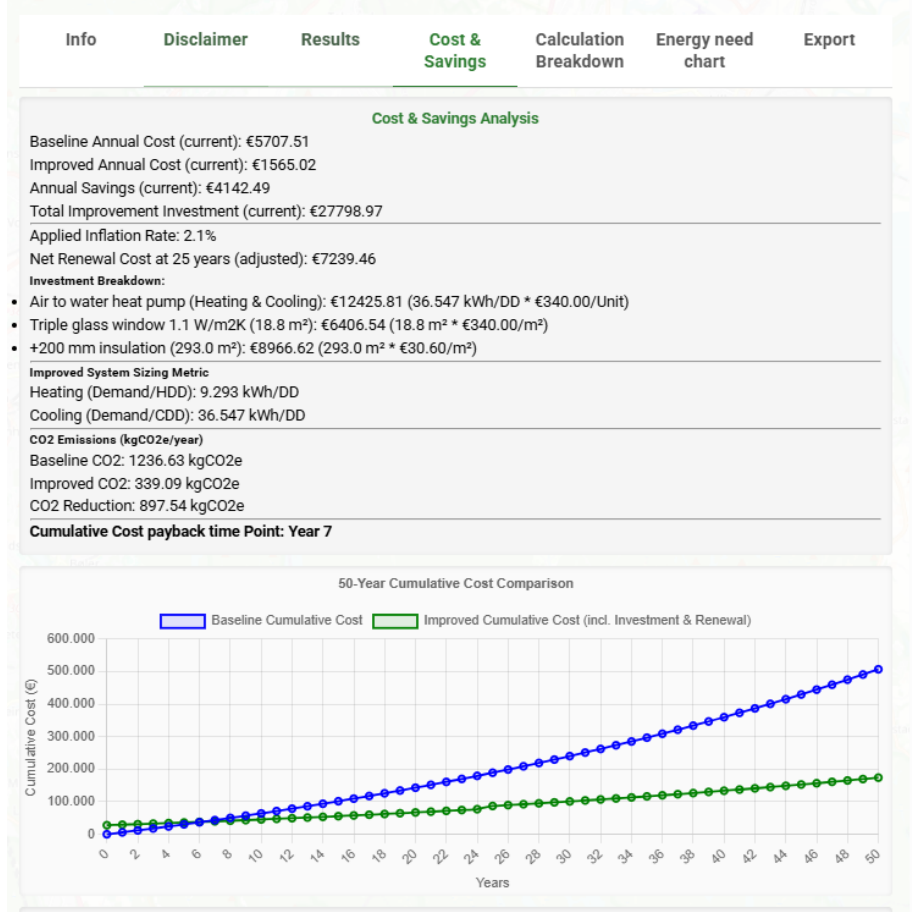
Step 4: Analyze Results

Results update automatically:

- **Demand Comparison:** See kWh reduction.



- **Cost & Savings Analysis:** Shows annual costs, investment, and payback period.

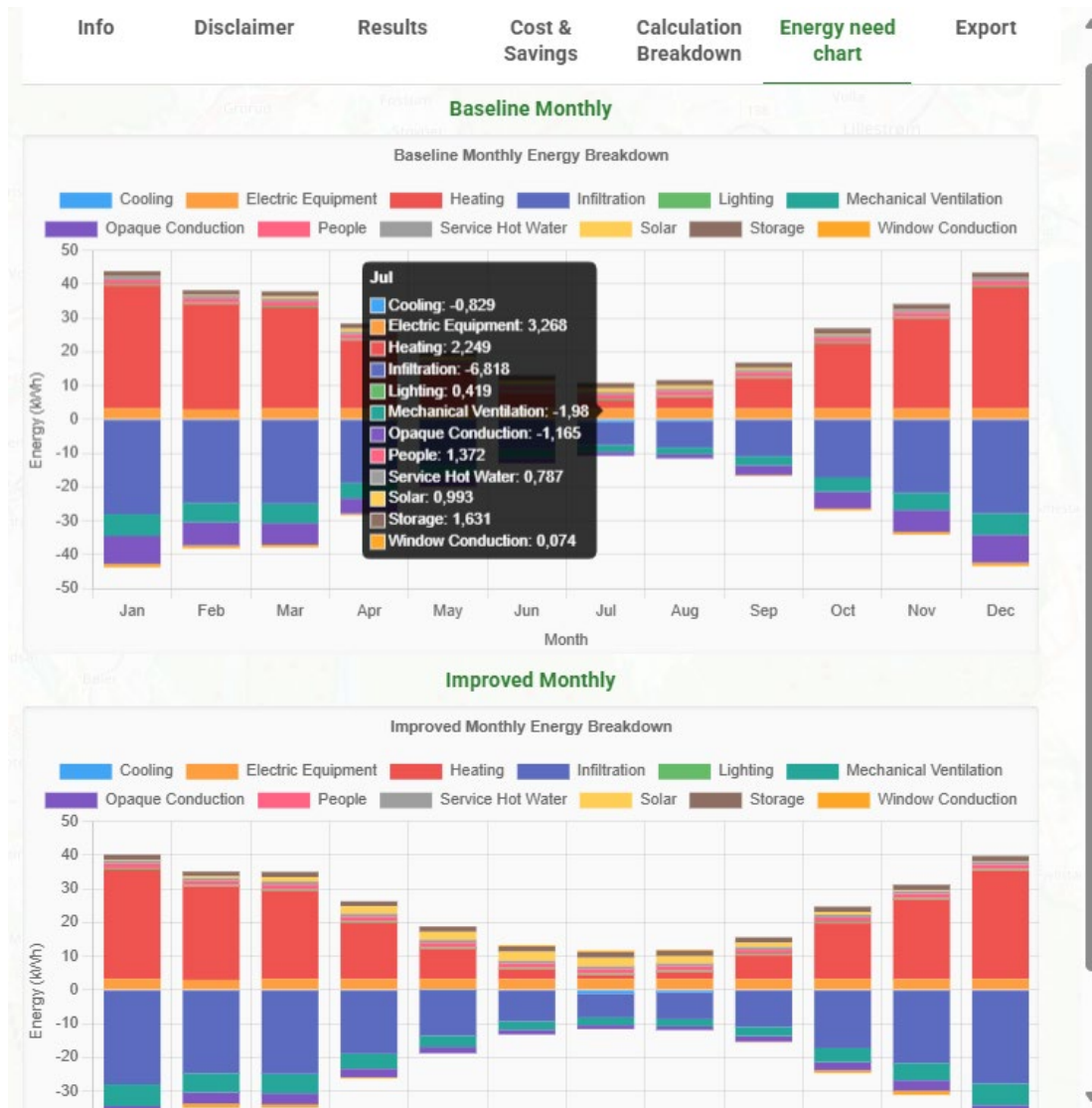


- **CO₂ Emissions:** View annual kgCO₂e reduction.
- **Charts:** Demand Comparison (bar), Cumulative Cost (line, 50yr), Monthly Breakdown (bar).

Info	Disclaimer	Results	Cost & Savings	Calculation Breakdown	Energy need chart	Export
Calculation Breakdown Using: Inflation: 2.1%, Elec Price: €0.1200/kWh, DH Price: €0.1100/kWh, Carbon Factor: 26.00 gCO ₂ e/kWh						
Baseline Raw Demand: Heat 45073.97 kWh, Cool 290.78 kWh Systems: Heat 'Electric boiler' (COP 0.95), Cool 'Air to air heat pump' (COP 2.50) Final Energy: Heat 47446.29 kWh, Cool 116.31 kWh Annual Cost (Heat): 47446.29 kWh * €0.1200/kWh = €5693.55 Annual Cost (Cool): 116.31 kWh * €0.1200/kWh = €13.96 Total Annual Cost = €5707.51 Baseline CO ₂ Emissions Total Final Energy: 47562.60 kWh CO ₂ Emissions: 47562.60 kWh * 26.00 gCO ₂ e/kWh / 1000 = 1236.63 kgCO₂e						
Improvement Raw Demand: Heat 38723.46 kWh, Cool 402.01 kWh Systems: Heat 'Air to water heat pump' (COP 3.00), Cool 'Air to water heat pump' (COP 3.00) Final Energy: Heat 12907.82 kWh, Cool 134.00 kWh Annual Cost (Heat): 12907.82 kWh * €0.1200/kWh = €1548.94 Annual Cost (Cool): 134.00 kWh * €0.1200/kWh = €16.08 Total Annual Cost = €1565.02 Sizing Metric (Demand / Degree Days) Heating: 38723.46 kWh / 4167 HDD = 9.293 kWh/DD Cooling: 402.01 kWh / 11 CDD = 36.547 kWh/DD Improved CO ₂ Emissions Total Final Energy: 13041.82 kWh CO ₂ Emissions: 13041.82 kWh * 26.00 gCO ₂ e/kWh / 1000 = 339.09 kgCO₂e CO₂ Reduction: 897.54 kgCO₂e						
Investment Breakdown & Total Total Investment = €27798.97 <ul style="list-style-type: none"> Air to water heat pump (Heating & Cooling): €12425.81 = 36.547 kWh/DD * €340.00/Unit Triple glass window 1.1 W/m²K (18.8 m²): €6406.54 = 18.8 m² * €340.00/m² +200 mm insulation (293.0 m²): €8966.62 = 293.0 m² * €30.60/m² Net Renewal Cost (at Year 25) Net Cost (Current Value): €4305.89 Adj. Net Cost (at Year 25): €7239.46 Summary Annual Savings (Current Value): €4142.49 Simple Payback: 6.7 yrs Cumulative Break-even (Chart): Year N/A						



Energy need chart:



3. Advanced Features

- **Cost Overrides:** Enter custom energy or measure costs (€/kWh, €).

Info	Disclaimer	Results	Cost & Savings	Calculation Breakdown	Energy need chart	Export
▼ Cost Overrides						
Electricity price (€/kWh) [€/kWh]:				<input type="text" value="0.1200"/>		
District heating price (€/kWh) [€/kWh]:				<input type="text" value="0.1100"/>		
Inflation Projection (%) [%]:				<input type="text" value="2.1%"/>		
Carbon factor [gCO ₂ e/kWh]:				<input type="text" value="26.00"/>		
Ground to water heat pump [€/(kWh/DD)]:				<input type="text" value="552.50"/>		
Air to water heat pump [€/(kWh/DD)]:				<input type="text" value="340.00"/>		
Air to air heat pump [€/(kWh/DD)]:				<input type="text" value="255.00"/>		
Electric boiler [€/(kWh/DD)]:				<input type="text" value="127.50"/>		
District heating [€ (Connection)]:				<input type="text" value="8500.00"/>		
Double glass window 1.75 W/m ² K [€/m ²]:				<input type="text" value="255.00"/>		
Triple glass window 1.1 W/m ² K [€/m ²]:				<input type="text" value="340.00"/>		
+100 mm insulation [€/m ²]:				<input type="text" value="15.30"/>		
+150 mm insulation [€/m ²]:				<input type="text" value="22.95"/>		
+200 mm insulation [€/m ²]:				<input type="text" value="30.60"/>		
<input type="button" value="Apply Cost Changes"/>						

Note: Click “Apply Changes” after entering custom values.

- **COP Overrides:** Adjust system Coefficient of Performance.

Info	Disclaimer	Results	Cost & Savings	Calculation Breakdown	Energy need chart	Export
▼ COP Overrides						
<i>Enter new COP values (must be > 0). Leave blank to use default.</i>						
No change heating:				<input type="text" value="0.80"/>		
Electric boiler:				<input type="text" value="0.95"/>		
District heating:				<input type="text" value="1.00"/>		
Air to air heat pump:				<input type="text" value="2.50"/>		
Air to water heat pump:				<input type="text" value="3.00"/>		
Ground to water heat pump:				<input type="text" value="3.50"/>		
No change cooling:				<input type="text" value="2.00"/>		
<input type="button" value="Apply COP Changes"/>						

Note: Click “Apply Changes” after entering custom values.

4. Exporting Report

Click “Export to PDF” to download a full report.

