TOOL FOR PARAMETRIC ENERGY CALCULATION

Technical User Documentation

Ecococon Bungalow Passive House System

Author	Ing. Tomáš Hakszer
Organisation	STU Bratislava
Version	1.0
Platform	Web Browser (React SPA)

Computational Design & Building Physics

1. Overview

The Tool for Parametric Energy Calculation is an interactive, browser-based building energy simulation application. It performs an 8,760-hour (whole-year, hourly) energy balance simulation to compute a building's annual Energy Use Intensity (EUI) and breakdown by end-use category. It is designed primarily around the Ecococon Family Bungalow passive house straw-bale construction system, but supports any rectangular building geometry.

The tool is intended for architects, engineers, and students performing early-stage parametric design studies. It allows rapid exploration of how design decisions — orientation, glazing ratios, insulation levels, HVAC system type, occupancy patterns — affect a building's annual energy demand, without requiring specialist simulation software.

1.1 What the Tool Calculates

At its core, the tool solves a steady-state energy balance at each hour of the year. For every hour, it computes a 'drift temperature' — the indoor temperature the building would reach without mechanical conditioning. If the drift temperature falls below the heating setpoint, heating energy is required; if it rises above the cooling setpoint and free cooling is not available, mechanical cooling is required. All other end-uses (lighting, equipment, domestic hot water, fans) are computed separately and summed to produce a total hourly energy figure.

End-Use Category	Method of Calculation
Space Heating	Heat pump energy = thermal demand / Heating COP
Space Cooling	Chiller energy = thermal demand / Cooling COP; free cooling via window opening when outdoor temp $<$ setpoint minus 2°C
Domestic Hot Water (DHW)	$Q = m \cdot C_p \cdot \Delta T$ = litres/person/day × occupants × (hot temp − mains temp) × 4.184 / 3600 [kWh/day]
Lighting	Lighting W/m^2 × gross area × operational fraction (hours/day × days/week)
Equipment / Plug Loads	Equipment W/m^2 × gross area × operational fraction
Fans / Auxiliaries	Proportional to conditioning load × system type multiplier × VAV multiplier × area factor

Note

The simulation engine uses a simplified steady-state hourly method, not a full dynamic thermal model (such as EnergyPlus). It is suitable for comparative parametric studies and early-stage design, but not for regulatory compliance calculations or detailed comfort analysis.

2. User Interface Layout

The interface is divided into two main areas: the left panel (inputs) and the right panel (live results). Results update automatically whenever any input value is changed — there is no 'Run' button required.

2.1 Header Bar

The header displays the active weather location (either the built-in Bratislava synthetic data, or the location parsed from an uploaded EPW file) and its coordinates. Two controls are provided:

Control	Function
Dark / Light Mode toggle	Switches the interface theme between dark (default) and light mode.
Upload EPW	Loads an EnergyPlus Weather (.epw) file to replace the built-in Bratislava synthetic climate with measured or TMY data for any location. The tool extracts dry-bulb temperature (column 7) and global horizontal irradiance (column 14) from each hourly row.

Note

EPW files can be downloaded free of charge from the EnergyPlus weather data portal (energyplus.net/weather) or from Climate.OneBuilding.Org for thousands of worldwide locations.

2.2 Input Panels

Inputs are grouped into four panels on the left side of the screen. Each slider shows its current value in a green badge, with the minimum and maximum range printed below. Select dropdowns and toggle switches are also used for categorical settings. All inputs except the EPW upload are continuous sliders or selects — no text entry is required.

2.3 Results Panel

The right-side panel is sticky (it remains visible while scrolling through inputs on larger screens). It shows the annual EUI, total building energy, a breakdown of annual consumption by end-use category, a monthly stacked bar chart, and two climate context charts (average monthly temperature and average daily solar radiation).

3. Input Parameters — Reference

3.1 Building Geometry

Defines the physical footprint and massing of the building. All calculations are based on a simple rectangular box geometry. Complex floor plans, roof shapes, or external shading objects are not modelled.

Parameter	Default	Range / Options	Description
Face N & S Length (m)	15	5 – 100 m	The dimension of the North and South facade walls, i.e. the length of the building measured in the North–South direction. This drives the area of the N and S facades available for glazing.
Face E & W Width (m)	10	5 – 100 m	The dimension of the East and West facade walls (building width in the E–W direction). Drives the area of E and W facades.
Number of Floors	1	1 – 10	Total number of above-ground storeys. Gross floor area = Length × Width × Floors. All floors are assumed to be identical in geometry.
Floor Height (m)	3.0	2.5 – 5.0 m	Clear floor-to-ceiling height per storey. Affects total building volume (and therefore infiltration and ventilation heat loss) and total facade area.
Building Orientation (°)	0°	-45° to +45°	Rotation of the building from the default axis where 0° means the long facade faces South directly. Positive values rotate clockwise (East). Limited to ±45° to keep the simulation physically meaningful for cardinal solar gains.

Note

Gross Floor Area (GFA) is computed as: GFA = Length × Width × Floors. This is the total conditioned area and the denominator used for the EUI calculation. For the default 15 m × 10 m single-storey bungalow, GFA = 150 m².

3.2 Directional Glazing and Shell

Controls the thermal performance of the building envelope — walls, roof, and windows — as well as the proportion of each facade that is glazed. These parameters have the largest influence on heating demand in the Bratislava climate.

Parameter	Default	Range / Options	Description
North Glazing %	10%	0 – 90%	Window-to-Wall Ratio (WWR) for the North facade. North-facing windows receive minimal solar gain year-round and should typically be minimised in cold climates. Passive house guidelines recommend keeping North WWR below 15%.
South Glazing %	30%	0 – 90%	WWR for the South facade. South-facing glazing is beneficial in heating-dominated climates as it admits solar gains in winter when the sun is low. The default of 30% is typical for passive house residential design.
East Glazing %	15%	0 – 90%	WWR for the East facade. Admits morning solar gain; less effective for winter heating than South, and can increase cooling loads in summer.
West Glazing %	15%	0 – 90%	WWR for the West facade. Admits afternoon solar gain; in summer this can cause significant overheating during peak afternoon temperatures. Shading control is especially important on West facades.
Roof Skylight %	0%	0 – 50%	Skylight-to-Roof Area ratio. Skylights receive high direct solar irradiance (especially in summer) and can contribute substantially to cooling loads if not controlled. The simulation applies a solar factor of 1.0 (direct vertical incidence) to roof glazing.
Wall U-Value (W/m²K)	0.13	0.10 – 3.00	Thermal transmittance of the opaque wall assembly. The default of 0.13 W/m²K corresponds to the certified Ecococon 492mm straw bale cassette assembly, which meets Passive House requirements. Lower values mean better insulation.
Roof U-Value (W/m²K)	0.12	0.10 – 2.00	Thermal transmittance of the roof assembly. The default 0.12 W/m²K represents a well-insulated passive house roof. This is typically the easiest element to over-insulate cost-effectively.
Glass U-Value (W/m²K)	0.85	0.50 – 5.00	Thermal transmittance of the complete window unit (frame + glass, Uw). The Passive House Institut standard requires Uw ≤ 0.85 W/m²K. Triple-glazed argon-filled units with thermally broken frames typically achieve 0.6–0.8 W/m²K.

3.2.1 Dynamic Shading (Total Shading Coefficient)

The shading coefficient (SC) represents the fraction of incident solar radiation that passes through the window system. Unlike a fixed SC, the tool models operable shading (e.g., external blinds or internal roller blinds) that responds to solar conditions.

Parameter	Default	Range / Options	Description
Total SC (Sunny)	0.20	0.10 – 1.00	SC applied when direct solar irradiance exceeds 250 W/m². This represents the shading device in its closed position (blinds down). A value of 0.20 means only 20% of incident solar radiation enters the space, which is typical for external venetian blinds.
Total SC (Overcast)	0.60	0.10 – 1.00	SC applied when solar irradiance is below 250 W/m² (diffuse/cloudy conditions). Shading is assumed retracted to maximise useful daylight and solar heating gains. A value of 0.60 is typical for clear triple glazing without shading.

Note

The SC in this tool is equivalent to the product of the glass Solar Heat Gain Coefficient (SHGC or g-value) and any shading device factor. A clear triple-glazed passive house window has g ≈ 0.5–0.6. With external blinds closed, the combined SC may drop to 0.10–0.15.

3.3 Loads and Occupancy

Defines internal heat gains from people, lighting, and electrical equipment. These gains reduce heating demand in winter but increase cooling demand in summer. The operational fraction (hours/day × days/week / 168) scales all internal gains proportionally.

Parameter	Default	Range / Options	Description
Occupants	4	1 – 15	Number of people assumed to be present during occupied hours. Affects sensible and latent heat gains, ventilation requirement (outside air), and domestic hot water demand.
Sensible Gain (W/person)	100	50 – 150 W/p	The sensible body heat released per person. This represents heat that directly raises air temperature. At sedentary activity (office, domestic), typical values are 70–90 W; at moderate activity 100–120 W.
Latent Gain (W/person)	25	10 – 100 W/p	Moisture (water vapour) released per person through respiration and perspiration. Latent gains do not raise air temperature directly, but increase humidity and therefore the dehumidification load on the cooling system. Typical domestic values: 25–40 W/person.
Lighting (W/m²)	5	1 – 25 W/m²	Installed lighting power density, averaged across the gross floor area. LED residential lighting: 3–6 W/m². LED office lighting: 8–12 W/m². All lighting power is assumed to be dissipated as heat in the space.
Equipment (W/m²)	8	1 – 30 W/m²	Plug load and equipment power density. Typical low-energy residential: 5–10 W/m².

Parameter	Default	Range / Options	Description
			Office: 10–20 W/m². Server rooms or laboratories can exceed 100 W/m².

Note

Operational Fraction is calculated from Hours/Day and Days/Week settings in the HVAC panel: opFrac = (hoursPerDay/24) × (daysPerWeek/7). The defaults of 24 hours/day and 7 days/week give opFrac = 1.0, representing a continuously occupied residential building. Reduce these values to model offices or intermittently-used buildings.

3.4 Thermostat and HVAC Systems

Controls the building's mechanical conditioning strategy, thermostat setpoints, and ventilation parameters. These settings affect both the quantity of energy needed (setpoints, ventilation rates) and the efficiency with which that energy is delivered (COP values, heat recovery).

3.4.1 Thermostat Setpoints

Parameter	Default	Range / Options	Description
Heating Setpoint (°C)	21°C	16 – 26°C	The minimum indoor air temperature maintained by the heating system. When the calculated drift temperature falls below this value, the heating system activates. Standard European residential: 20–22°C.
Cooling Setpoint (°C)	24°C	20 – 30°C	The maximum indoor air temperature above which the cooling system activates. Free cooling (natural ventilation) is assumed when the outdoor temperature is more than 2°C below this setpoint. Standard comfortable cooling setpoint: 24–26°C.
Target Humidity (%)	50%	30 – 70%	Target relative humidity. This drives the latent (dehumidification) load calculation. At higher humidity settings, less dehumidification energy is required. Does not affect sensible heat balance directly.

3.4.2 System Configuration

Parameter	Default	Range / Options	Description
System Type	Air/Water	All-Air / Air/Water	The type of HVAC distribution system. 'All-Air' systems deliver all conditioning via air ducts (higher fan energy). 'Air/Water' systems use radiant panels or fan-coil units for most conditioning with a smaller ventilation air stream (lower fan energy; 0.4× multiplier applied to fan loads in this model).
Air Volume	VAV	Const Vol / VAV	Variable Air Volume (VAV) systems modulate airflow to match demand, significantly reducing fan energy at part load (0.6× fan energy multiplier). Constant Volume (CV) systems always deliver full design airflow regardless of load.
Sensible Recovery	On	On / Off	If enabled, the Heat Recovery Ventilation (HRV) unit recovers sensible heat from

Parameter	Default	Range / Options	Description
			exhaust air, reducing the ventilation heating/cooling load. The model applies a 75% effective reduction to the ventilation sensible load when enabled.
Latent Recovery	Off	On / Off	If enabled, an Energy Recovery Ventilator (ERV) is assumed that also recovers latent heat (moisture) from exhaust air. Reduces the ventilation latent load by 60% when enabled.
Heating COP	3.5	0.5 – 5.0	Coefficient of Performance of the heating system. For a heat pump, COP = useful heat output / electrical input. COP 3.5 is typical for a modern air-source heat pump at Bratislava conditions. Gas boiler: COP ≈ 0.85–0.95.
Cooling COP	4.0	2.0 – 7.0	COP of the cooling system. Modern inverter-driven split systems achieve COP 3.5–5.0 at design conditions. Chillers for larger systems: 3.0–4.5.
Outside Air (L/s/person)	10	5 – 20 L/s/p	Fresh air supply rate per person required for indoor air quality. EN 16798-1 Category II residential: 10 L/s/person. Higher rates improve air quality but increase ventilation heat loss.
Infiltration (ACH)	0.3	0.1 – 2.0 ACH	Uncontrolled air leakage rate through the building envelope, expressed as Air Changes per Hour. Passive House airtightness standard: n50 ≤ 0.6 ACH at 50 Pa, corresponding to natural infiltration of approximately 0.03–0.05 ACH. The default 0.3 represents a well-sealed but not Passive House-certified construction.

3.4.3 Domestic Hot Water (DHW)

Parameter	Default	Range / Options	Description
Hot Water (L/person/day)	40 L	5 – 100 L	Daily hot water consumption per person. European residential average: 40–60 litres/person/day. Low-consumption household with efficient fixtures: 25–35 L/p/day.
Mains Temperature (°C)	10°C	5 – 20°C	Incoming cold water temperature (from the mains supply). This is the starting temperature before heating. In Bratislava, average mains temperature is approximately 8–12°C depending on the season (the model uses a fixed annual average).
Target Hot Water Temp (°C)	60°C	40 – 80°C	The delivery temperature of domestic hot water. 60°C is standard to prevent Legionella bacteria growth. Lower temperatures (e.g. 45–50°C) increase heat pump efficiency but require additional anti-Legionella treatment.

4. Weather and Climate Data

The accuracy of any building energy simulation depends critically on the quality of the weather data used. This tool supports two modes of weather input:

4.1 Built-in Synthetic Bratislava Data

When no EPW file is uploaded, the tool uses an 8,760-hour synthetic climate dataset internally generated for Bratislava, Slovakia (latitude 48.152°N, longitude 17.113°E). The data is constructed using empirical sinusoidal models:

Variable	Model Used
Dry-Bulb Temperature	Annual sinusoidal profile (mean 9.8°C, amplitude ±10.6°C, peak Jan 20) plus daily sinusoidal variation (amplitude ±4.2°C, peak at 03:00).
Global Horizontal Irradiance (GHI)	Computed from astronomical solar geometry (declination, hour angle, zenith angle for lat 48.152°N) and attenuated by a seasonally-varying cloud cover factor (mean 50%, range ±30%).

4.2 Uploading an EPW File

To use measured or TMY (Typical Meteorological Year) data, click 'Upload EPW' in the header and select a standard EnergyPlus Weather format file. The tool reads:

Row 1 (Location header): Site name, country, latitude, and longitude.

Rows 9 onwards (hourly data): Month (col 2), Dry-Bulb Temperature (col 7, °C), and Global Horizontal Irradiance (col 14, Wh/m²).

> **Note**
>
> EPW files must contain at least 8,000 valid hourly rows to be accepted. If the file is invalid or truncated, the tool will show an alert and revert to the built-in data. The EPW format specification is defined by EnergyPlus and is compatible with files from EnergyPlus Weather, Climate.OneBuilding.Org, Meteonorm, and most major BEM (Building Energy Modelling) software exporters.

5. Outputs and Results Panel

The results panel on the right side of the interface displays all key simulation outputs, updated live as inputs change. The following sections describe each output in detail.

5.1 Annual EUI (Energy Use Intensity)

The large numeric display at the top of the results panel shows the building's total annual Energy Use Intensity in kWh/m²/year. This is the most important single number produced by the simulation.

EUI Range	Performance Classification	Display Colour
≤ 60 kWh/m²/yr	Excellent — Passive House / Near-Zero Energy	**Green**
61 – 120 kWh/m²/yr	Moderate — meets or exceeds typical building code requirements	**Amber**
> 120 kWh/m²/yr	Poor — significant energy performance improvements required	**Red**

The EUI is calculated as: EUI = Total Annual Energy Consumption [kWh] / Gross Floor Area [m²]

The total building energy in MWh/year is displayed below the EUI for reference.

5.2 Annual Consumption Breakdown

Six tiles display the total yearly energy for each end-use category in absolute kWh. These values allow identification of which end-use dominates the building's energy budget.

Tile Colour	Category	Notes
Orange	Heating	Electrical energy input to heat pump. Includes envelope losses, ventilation, and infiltration. Dominant in Bratislava climate.
Blue	Cooling	Electrical energy input to cooling plant. Includes free cooling hours when outdoor conditions allow natural ventilation.
Rose	DHW	Domestic hot water heating energy. Constant throughout year (model uses fixed annual average mains temperature).
Yellow	Lighting	Electrical energy for artificial lighting. Assumes uniform operation (no daylight control or occupancy sensors).
Purple	Equipment	Plug loads and fixed equipment. Treated as a constant internal gain proportional to floor area.
Cyan	Fans	Supply and return fan energy. Reduced by VAV and Air/Water system type multipliers.

5.3 Monthly Energy Profile Chart

A stacked bar chart showing total energy consumption by month (January to December). Each bar is divided into the six colour-coded end-use categories. Hovering over a bar reveals a tooltip with heating, cooling, and total energy for that month in kWh. This chart is particularly useful for identifying seasonal patterns — for example, whether heating or cooling dominates, and which months drive the annual peak.

5.4 Climate Context Charts

Two small charts provide visual context for the active weather data:

Average Monthly Temperature (°C): Bar chart with positive temperatures shown in red/rose and negative temperatures in blue. Useful for quickly understanding heating and cooling season lengths.

Average Daily Solar Radiation (kWh/m²): Amber bar chart showing monthly-average daily global horizontal irradiance. Helps understand when solar gains are significant and when shading is most important.

Both charts support hover tooltips showing the precise value for each month.

6. Simulation Engine — Technical Notes

This section describes the physical assumptions and simplifications made in the simulation engine for users who need to understand the basis of the results or assess their suitability for a given study.

6.1 Thermal Balance Equation

For each of the 8,760 hours in the year, the simulation computes a drift temperature Tdrift using a steady-state heat balance:

```
Tdrift = Toutdoor + (Qgains / UA_total)
```

Where Qgains is the sum of all free heat gains (solar through windows + internal loads from people, lighting, and equipment) in kW, and UA_total is the total building heat loss coefficient in kW/K.

6.2 Heat Loss Coefficient (UA_total)

Three heat loss pathways are combined:

Pathway	Calculation
Envelope conduction	UA_envelope = Σ(A_wall × U_wall) + Σ(A_win × U_win) + Σ(A_roof × U_roof) [W/K]
Infiltration	UA_inf = Volume × ACH × 0.33 [W/K], where 0.33 = volumetric heat capacity of air (Wh/m³K)
Mechanical ventilation	UA_vent = Occupants × OA_rate × 1.2 × sensible_recovery_factor [W/K], where 1.2 = volumetric heat capacity of air in W/(m³/s·K)

6.3 Solar Gain Model

Solar gains are computed for each facade direction using a simplified orientation factor. The factor represents the fraction of incident horizontal irradiance that strikes a vertical surface facing a given cardinal direction, accounting for the building's orientation offset. Roof skylights receive the full horizontal irradiance (factor = 1.0). The shading coefficient (SC) from the dynamic shading model is then applied to the resulting gain.

Note

The solar gain model does not account for obstructions, overhangs, neighbouring buildings, or diffuse-to-direct irradiance splitting. It uses global horizontal irradiance as the single radiation variable. For detailed shading and daylighting analysis, dedicated tools such as Radiance, ClimateStudio, or DIVA are recommended.

6.4 Free Cooling Logic

The simulation implements a simple free cooling bypass: if the building needs cooling (Tdrift > Tcooling setpoint) but the outdoor temperature is more than 2°C below the cooling setpoint, mechanical cooling is not engaged. Instead, natural ventilation is assumed to provide adequate cooling. This reduces computed cooling energy and is a conservative representation of night-flush or cross-ventilation strategies.

6.5 Known Limitations

Users should be aware of the following simplifications relative to full dynamic simulation engines such as EnergyPlus or IDA ICE:

Thermal mass is not modelled. The simulation assumes steady-state conditions at each hour with no thermal storage in the building fabric. This tends to overestimate peak cooling loads and slightly underestimate heating loads for heavy-mass construction.

No inter-zone heat transfer. The building is modelled as a single thermal zone. Zoned buildings (e.g., heated vs. unheated spaces) cannot be represented directly.

Rectangular geometry only. L-shaped, courtyard, or other non-rectangular floor plans are not supported.

Fixed mains water temperature. DHW energy does not vary seasonally with ground temperature.

Simplified fan model. Fan energy is calculated as a fixed percentage of conditioning load rather than from duct system pressure calculations.

7. Quick-Start Tutorial

Follow these steps to run your first simulation and understand the key cause-and-effect relationships in the tool.

Step 1: Open the Tool

Open the tool in a modern web browser. No installation is required. The tool loads with default parameters representing the Ecococon Family Bungalow at 15 m × 10 m, single storey, with Bratislava climate data. Note the EUI displayed in the results panel on the right.

Step 2: Change the Wall U-Value

In the 'Directional Glazing & Shell' panel, drag the 'Wall U-Value' slider from 0.13 to 0.50 W/m²K. Observe how the EUI increases significantly, and how the 'Heating' value in the annual totals increases most strongly. This demonstrates how well-insulated walls are the primary defence against heating losses in cold climates.

> **Note**
>
> Return the Wall U-Value to 0.13 before proceeding.

Step 3: Explore South Glazing

Increase 'South Glazing %' from 30% to 60%. You will see a modest reduction in heating energy (more solar gains in winter) but an increase in cooling energy (overheating risk in summer). This illustrates the trade-off that passive solar design must manage.

Now reduce the 'Total SC (Sunny)' shading coefficient to 0.10 (heavy external shading). The cooling energy will drop substantially while heating changes little, demonstrating the value of shading on South facades.

Step 4: Upload an EPW File

Download an EPW file for a different climate (e.g., Vienna, Munich, or Oslo) from energyplus.net/weather. Click 'Upload EPW' and select the file. Observe how the monthly energy profile and climate context charts change, and how the EUI shifts to reflect the different heating and cooling demands of that climate.

Step 5: Evaluate System Efficiency

In the 'Thermostat & Systems' panel, change the Heating COP from 3.5 to 1.0 (representing a direct electric resistance heater). Observe the large increase in heating energy consumption. This demonstrates how heat pump efficiency is critical for low-energy buildings — the same thermal demand is delivered far more efficiently when COP > 1.

Click the 'Reset' button in the results panel to return all parameters to default values at any time.

8. Input Parameter Quick Reference

A concise summary of all input parameters for quick reference during use.

Parameter	Default / Ecococon	Key Interaction
N–S Length	15 m	Drives N & S facade glazing area and solar gain potential
E–W Width	10 m	Drives E & W facade glazing area
Floors	1	Multiplies GFA and all area-dependent loads
Floor Height	3.0 m	Affects building volume → infiltration and ventilation losses
Orientation	0°	Rotates all solar gain factors; optimum typically near 0° for South-facing
North WWR	10%	Low values critical — North glazing is a net energy loser in cold climates
South WWR	30%	Key passive solar parameter; trade-off between heating gain and cooling load
East/West WWR	15%	Morning/afternoon solar gains; West most problematic for summer overheating
Roof Skylight	0%	Very high irradiance — small % can cause large cooling loads
Wall U-Value	0.13 W/m²K	Most sensitive parameter for heating demand in cold climate
Roof U-Value	0.12 W/m²K	Usually lower than walls due to more insulation headroom
Glass U-Value	0.85 W/m²K	Passive House limit; large windows make this critical
SC Sunny / Overcast	0.20 / 0.60	Dynamic shading — biggest lever for reducing summer cooling loads
Occupants	4	Drives internal gains, DHW, and outside air requirements
Sensible/Latent Gain	100 / 25 W/p	Higher activity → more cooling required in occupied hours
Lighting W/m²	5 W/m²	Switch to LED to reduce from typical 10–15 to 3–6 W/m²
Equipment W/m²	8 W/m²	Significant in offices; modest in low-energy residential
Heating Setpoint	21°C	Each +1°C increases heating demand ~5–10%
Cooling Setpoint	24°C	Each -1°C increases cooling demand substantially
System Type	Air/Water	Air/Water saves significant fan energy vs. All-Air
Air Volume	VAV	VAV vs CV: large fan energy saving at part-load
HRV Sensible	On	Essential for passive house; saves ~75% of ventilation heat loss
Heating COP	3.5	Heat pump vs electric resistance: 3.5× less electrical energy

Parameter	Default / Ecococon	Key Interaction
Cooling COP	4.0	High COP chillers and inverter splits reduce cooling electrical demand
Outside Air	10 L/s/p	Minimum for good IAQ; higher rates increase ventilation losses
Infiltration	0.3 ACH	Passive house target: <0.05 ACH (natural)
Hot Water (L/p/d)	40 L	DHW is often the second-largest energy end-use in passive houses
Mains Temp	10°C	Lower = more energy to heat DHW
Hot Water Temp	60°C	60°C required for Legionella control

End of Document

Ing. Tomáš Hakszer | Tool for Parametric Energy Calculation v1.0