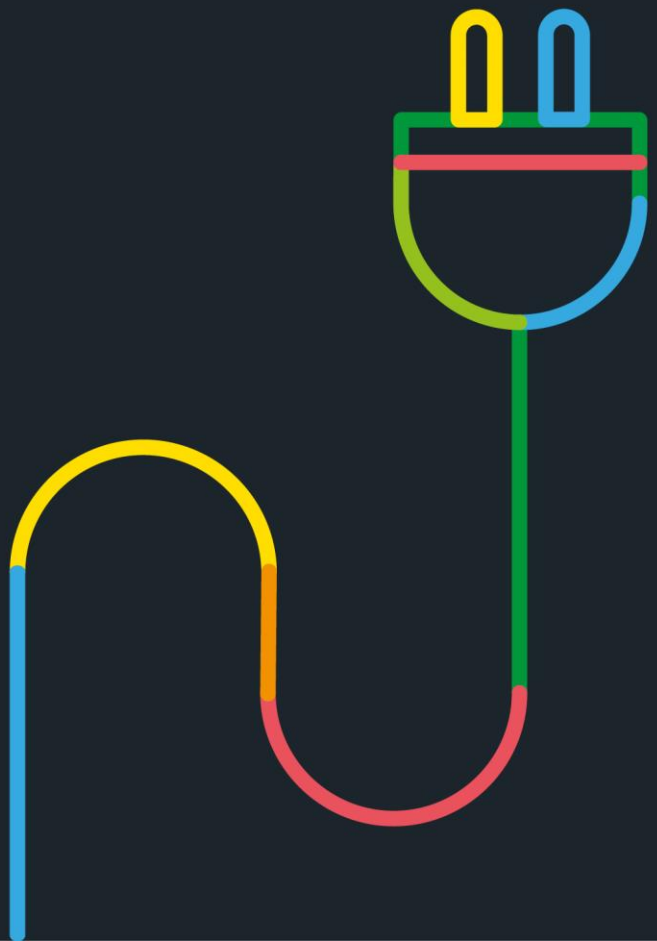
Joint hybridGEOTABS and ALDREN Workshop and Webinar



How to express hybridGEOTABS in the ALDREN Evaluation Scheme?

The ALDREN procedure

European Voluntary Certification Scheme ratings (EVC)

ALDREN ALliance for Deep RENovation in buildings

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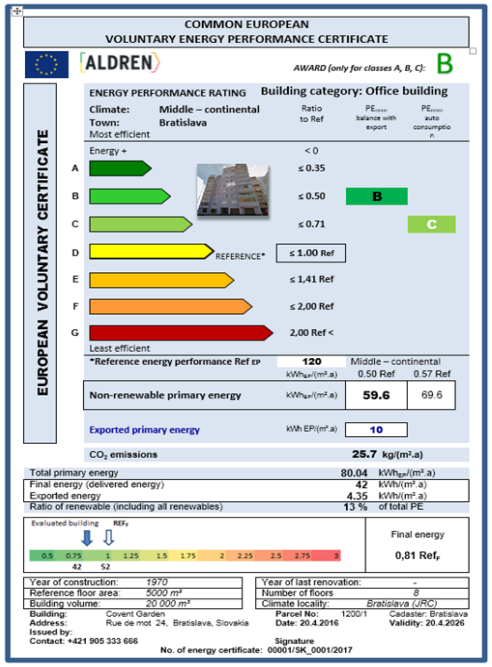
VOLUNTARY COMMON EU CERTIFICATE (EVC)



The main features are

- **Harmonized calculation methodology** based on new CEN standards developed under Commission Mandate M/480,
- Provides direct comparability of EP and transparency across the EU for **EU buildings stocks management**
- **Harmonized consideration of the innovative solutions** - all technical systems in the same way (**hybridGEOTABS**).
- **EVC** = **advisory tool** for building owner, tenant, managers, financial institutions, policy makers.
  EP before → after renovation
- **EVC** - can stand alone or can be included as energy module in other existing scheme (adaptation to existing voluntary schemes)

The main technical pillars for harmonized comparability European wide

- **Calculation methodology**
- **Indicators**
- **Performance scale and reference**
- **Content and template of European Voluntary Certificate**

CALCULATION METHODOLOGY

- ✓ **CEN standards 2017** (M/480) = the reference methodology (EPBD, Annex I)
- ✓ **Software** (methodology) **close to the CEN standards,** based on the **hourly calculation step**
- ✓ **typical use** (national - shows intrinsic potential of building)
- ✓ **climate of the specific location** instead of national standard climate (JRC hourly climate data) - closer to real consumption
- ✓ PEF – CEN standard (EN ISO 52000-1)

Advantage:

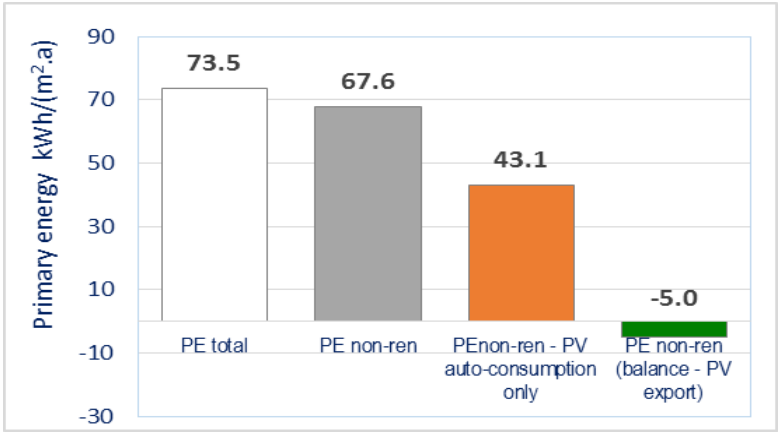
- ✓ all products taken into account in the same way, comparability - level playing field for **products**
- ✓ **Common EU market for**
  - **software**
  - **training, experts** (CEN standards)

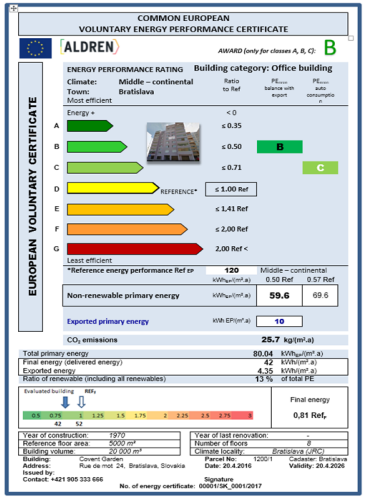
hybridGEOTABS – to be included in calculation - CEN standards

INDICATORS

THE MAIN INDICATOR

non-renewable primary energy balance
with compensation by exported energy





*Alternatives of numeric indicator of primary energy use for the same building (*no comparability)

EPBD: The energy performance of a building shall be expressed by a **numeric indicator of primary energy use in kWh/(m².y)** for the purpose of both energy performance certification and compliance with minimum energy performance requirements .....

ALDREN → **All indicators included** (needed for existing schemes, DGNB, IVE, HQE)

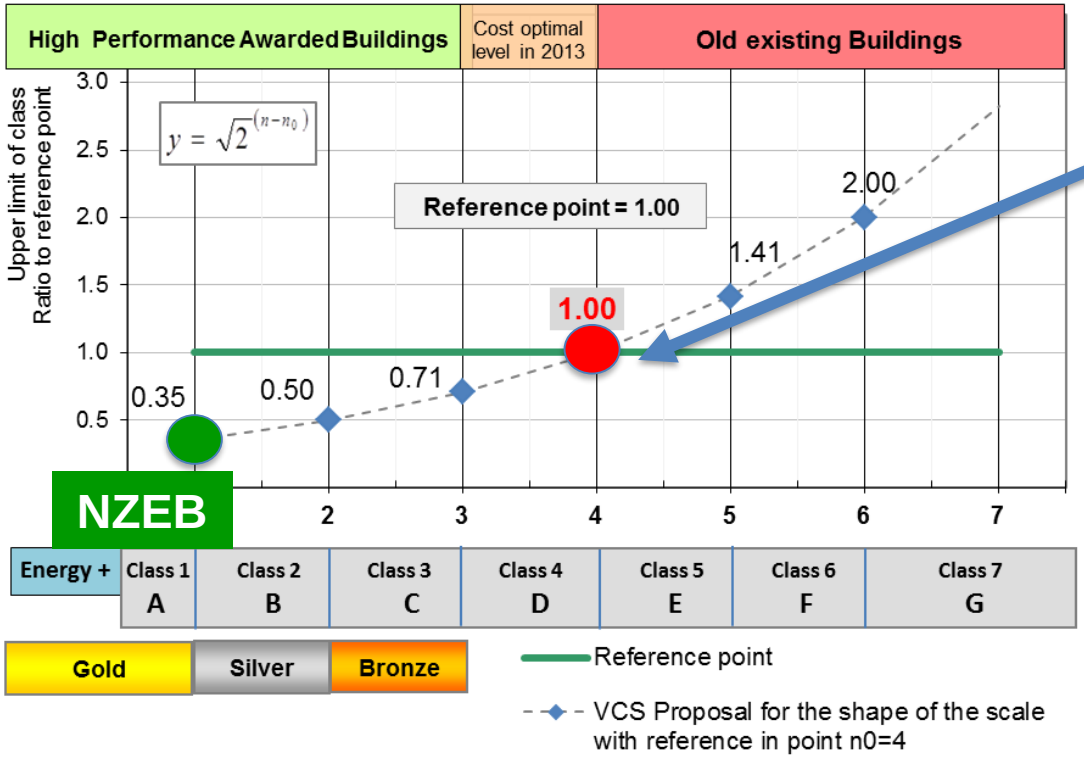
VOLUNTARY COMMON EU CERTIFICATE (EVC)

- ✓ Common EP indicators and classe
  - **non-renewable primary energy balance**
  - **non-renewable primary energy (no export)**

Additional indicators

- ✓ The entire building's overall energy use (EPBD)
- ✓ Total PE, delivered energy, CO_2, energy production, share of renewable energy
- ✓ Measured energy (optional)
- ✓ Wellbeing indicators (optional)
- ✓ Energy class after recommended improvements,
- ✓ Potential energy savings
- ✓ **Recommendations for improvement** → link with the **Building renovation passport**

THE ENERGY PERFORMANCE SCALE



One reference point
≈ CO level (2013)
upper limit of **class „D“.**

Current MR ≈ class B-C

Class „A“ - approximation to the NZEB definition

Relative scale - the ratio to the **„reference point“**

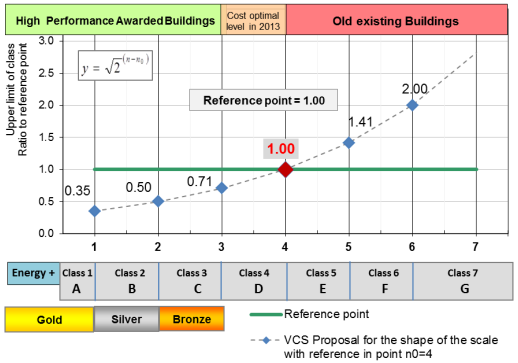
Reference point - expressed in kWh/(m^2.a)

Different options for the scale and reference are tested.

SCALE

REFERENCE POINT

Class	Energy classes
Energy +	EP < 0
A	0 Ref ≤ EP ≤ 0,35 Ref
B	0.35 Ref < EP ≤ 0.50 Ref
C	0.50 Ref < EP ≤ 0.71 Ref
D	0.71 Ref < EP ≤ **1.00** Ref
E	1.00 Ref < EP ≤ 1.41 Ref
F	1.41 Ref < EP ≤ 2.00 Ref
G	2.00 Ref < EP



Different options for Ref are tested.

Alt. 1 - Different for 4 climates in Legal document

COMMISSION RECOMMENDATION (EU) 2016/1318

on guidelines for the promotion of nearly zero-energy buildings and best practices to ensure that, by 2020, all new buildings are nearly zero-energy buildings

Climate	Net non-renewable primary energy use kWh/(m².y)	On-site renewable sources kWh/(m².y)	Total primary energy use kWh/(m².y)
Offices			
Mediterranean	20-30	60	80-90
Oceanic	40-55	45	85-100
Continental	40-55	45	85-100
Nordic	55-70	30	85-100

Extrapolation to Ref

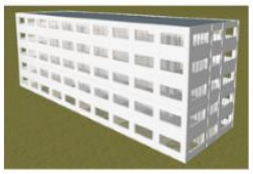
Alt. 2 - Fixed value for all climates

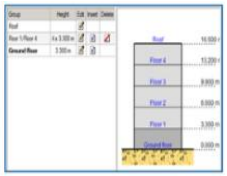
Proposal (EC 2016)

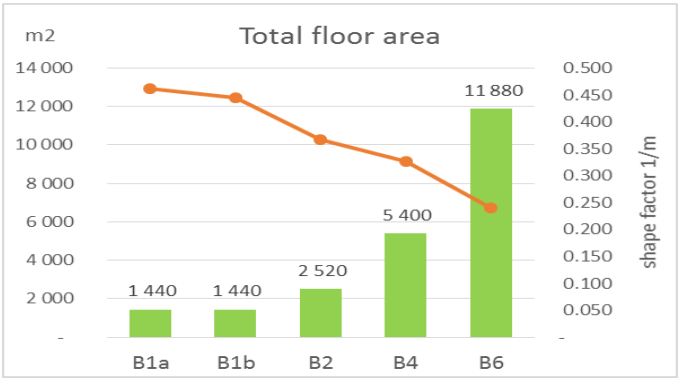
- Offices: Ref = 120 kWh/(m².a);
- Educational buildings: Ref = 120 kWh/(m².a);
- Retail trade buildings: Ref = 240 kWh/(m².a);
- Wholesale buildings: Ref = 150 kWh/(m².a);
- Hotels and restaurants: Ref = 160 kWh/(m².a);
- Assembling halls: Ref = 140 kWh/(m².a);
- Hospitals: Ref = 240 kWh/(m².a);

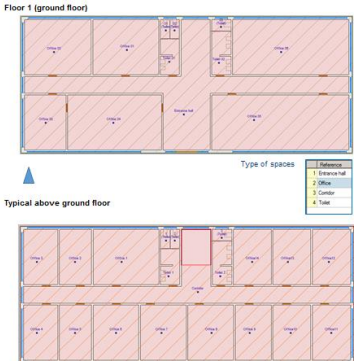
Scale Testing

Offices
Hotels









5 model buildings (different size)

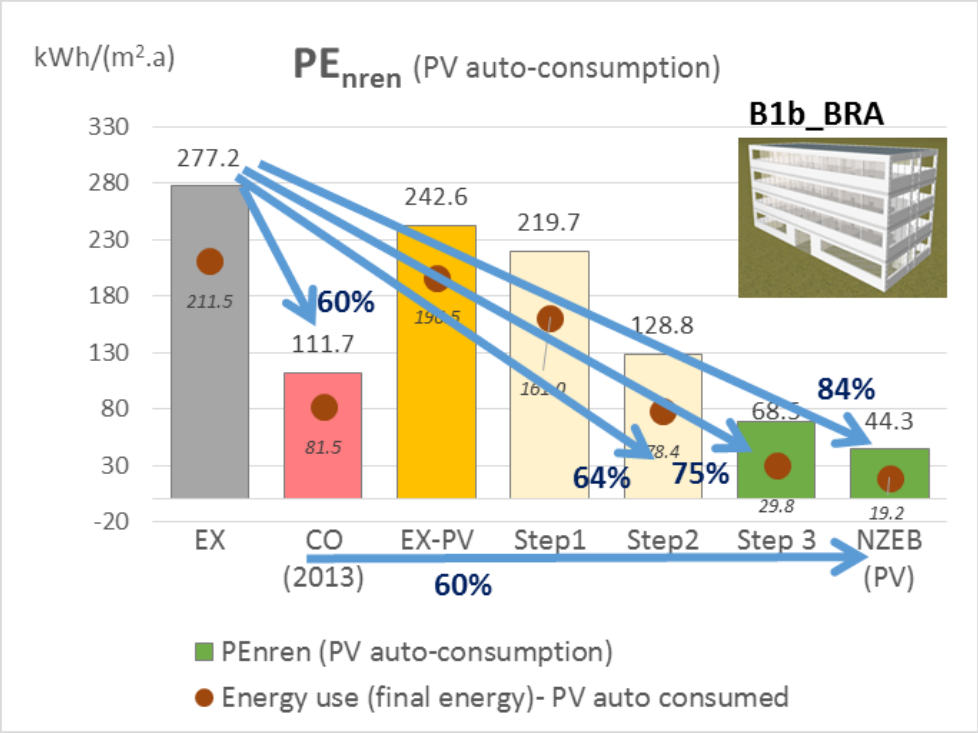
3 climates - Helsinki, Bratislava, Palermo

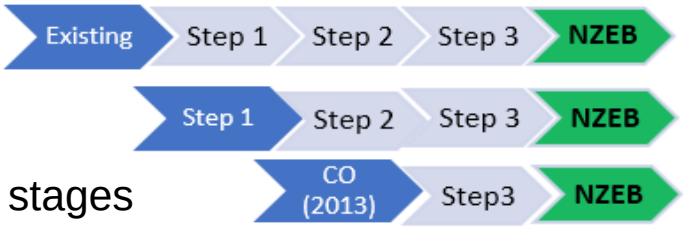
3 levels of building quality
(old existing - CO reports 2013, CO level 2013, NZEB)

- ✓ Model buildings
- ✓ Real pilot buildings

Software
hourly calculation step
(close to the CEN EPB standards)

RENOVATION STEPS – TARGETS FOR DIFFERENT PRE-RENOVATION STAGES





3 pre-renovation stages

Link:

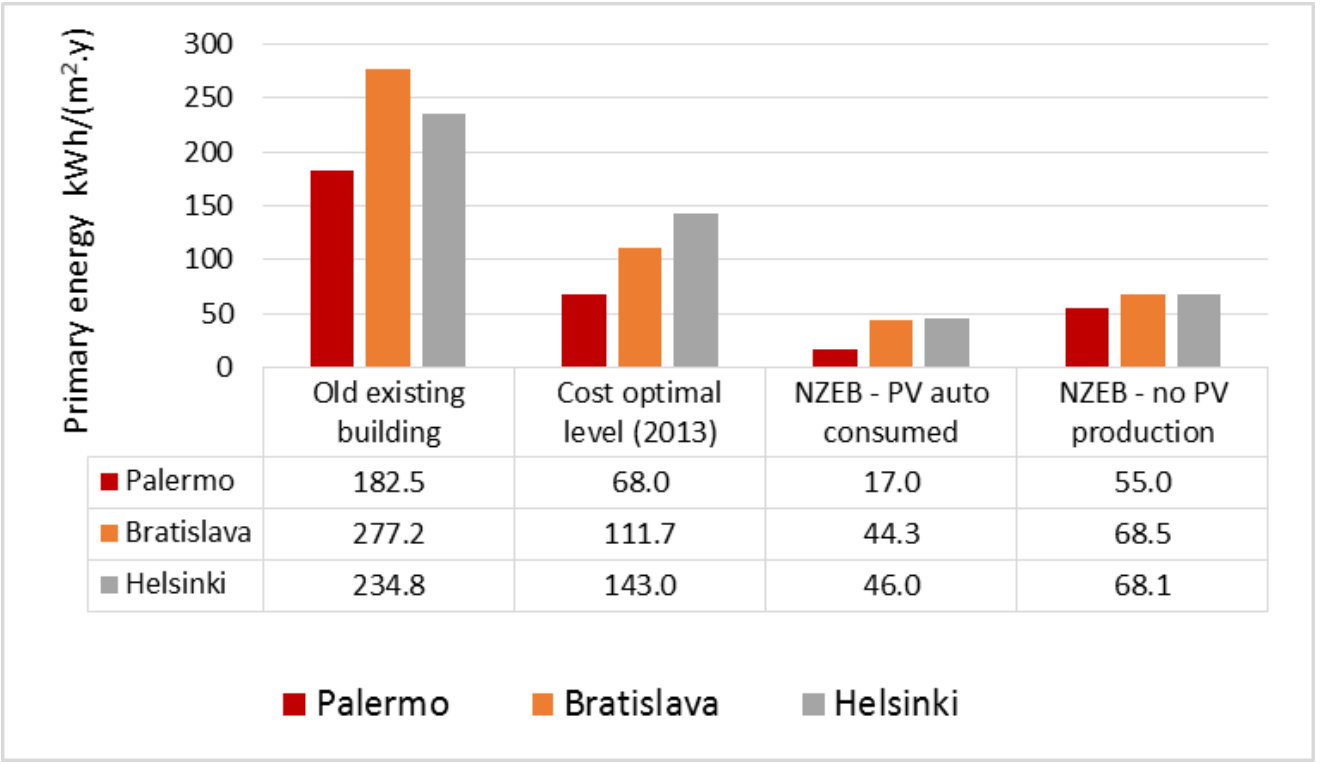
- ✓ **<u>Strategies, recommendations</u> ← Building renovation passport**
- ✓ **<u>Savings</u> → cost, financial valuation**

Testing energy class transition

PE_{nren}	EX	G
	CO (2013)	D
	NZEB	C
PE_{nren} (PV auto-consumption only)	EX	G
	CO (2013)	C
	NZEB	B
PE_{nren} (balance - PV export))	EX	F
	CO (2013)	A
	NZEB	A+

ENERGY PERFORMANCE

in different climates



	Old existing building	Cost optimal level (2013)	NZEB - PV auto consumed	NZEB - no PV production
Palermo	182.5	68.0	17.0	55.0
Bratislava	277.2	111.7	44.3	68.5
Helsinki	234.8	143.0	46.0	68.1

Scale adaptation

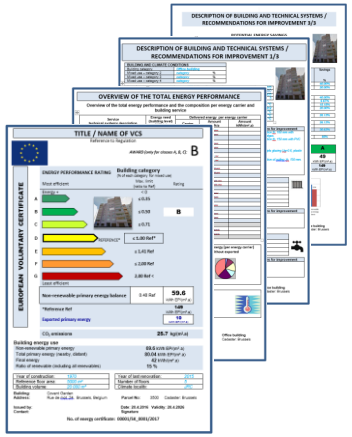
Building properties adapted to 3 climates and national conditions
(typical buildings from reports from CO calculation, requirements for NZEB).

NZEB – climate neutral (moderate-cold)
difference due to solar energy (PV potential).

Connection of EVC with ALDREN common language

Energy rating & targets

Outcomes from EP calculation are inputs in other tasks



Measured performance verification

Health and well-being

Linking EVCS to the financial valuation

Building Renovation Passport

Comparison of EP under standard and real conditions

Hourly IEQ data air/operative temperature, humidity, mold risk, light

Direct cost savings due to renovation (energy cost, maintenance, replacement cost)

Data collection in BRP, renovation towards NZEB level

ALDREN ALliance for Deep RENovation in buildings

ENBEE Environment & Building Energy Efficiency

www.aldren.eu

Thank you

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