Guidehouse

BUILD_ME

LCEC
LEBANESE CENTER FOR ENERGY CONSERVATION
المركز اللبناني لحفظ الطاقة

National Workshop: LEBANON

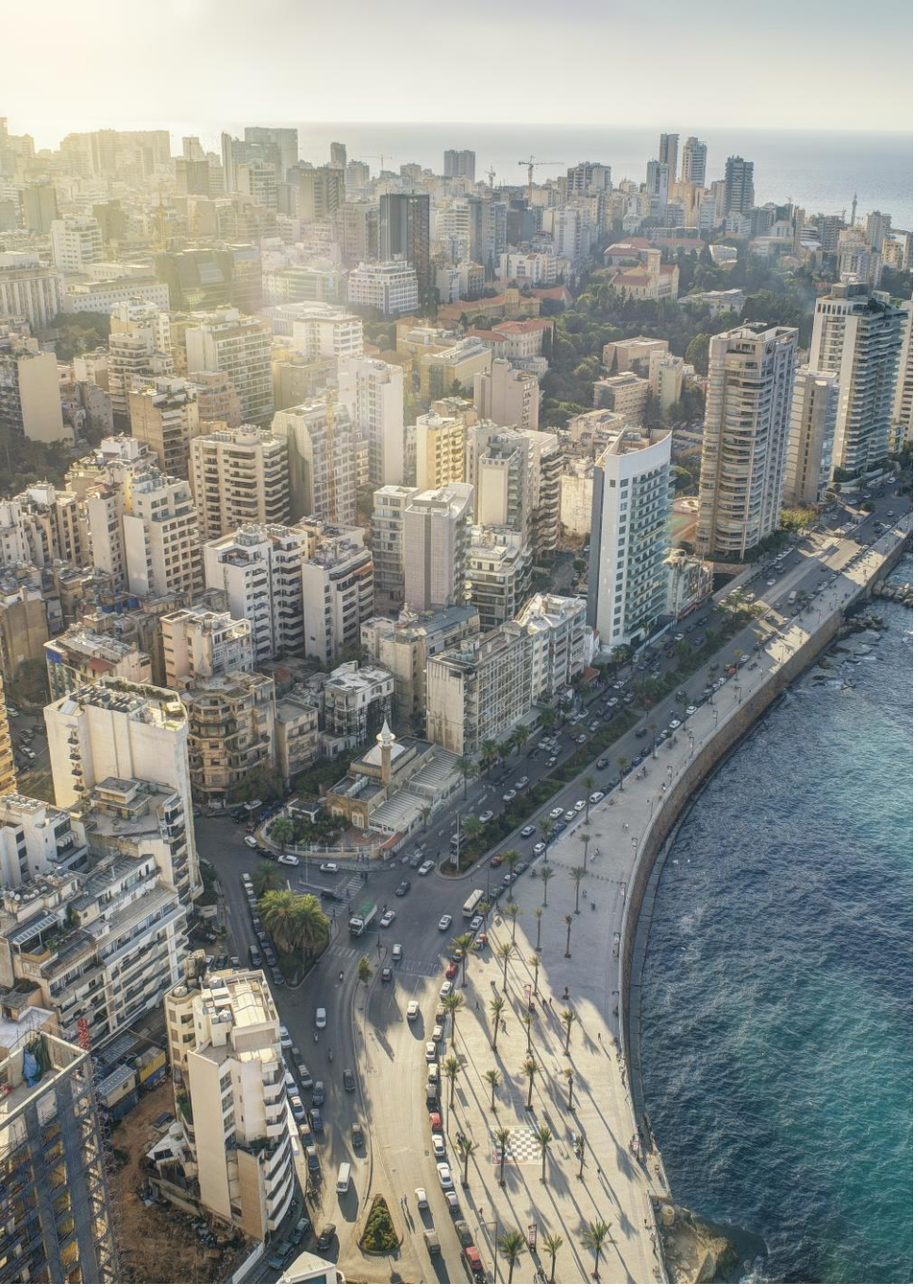
Climate-friendly buildings in the MENA region

18 March 2021

Supported by:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

based on a decision of the German Bundestag



Agenda

What to expect

01	Welcome	06	Assessment and Recommendations for the NEEAP 2021-2025
02	BUILD_ME Update: Where do we stand after 2020?	07	Roadmap of a voluntary classification scheme
03	BUILD_ME tools and the building sector in Lebanon	08	Demonstration Project Database
04	Q&A	09	Q&A
05	Break	10	Wrap up and Outlook

Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

Technical instructions

Working together effectively

- Presentation will be published on our project web page afterwards.
- The session will be recorded.
- Please stay muted but feel free to write your questions in the chat box or raise your hands in the Q&A sessions. Questions will be answered in the Q&A sessions.
- Please be punctual after the break.
- We look forward to active participation in the polls and Q&A session.
- For technical problems/questions, reach out to
  - Patil Mesrobian at patil.Mesrobian@lcec.org.lb or +961 (1) 565 108
  - OR Kristen Brand at kristen.brand@guidehouse.com or +31 6 29307813.

Photo by Chris Montgomery on Unsplash

Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

BUILD_ME Update: Where do we stand after 2020?

Riadh Bhar, Guidehouse

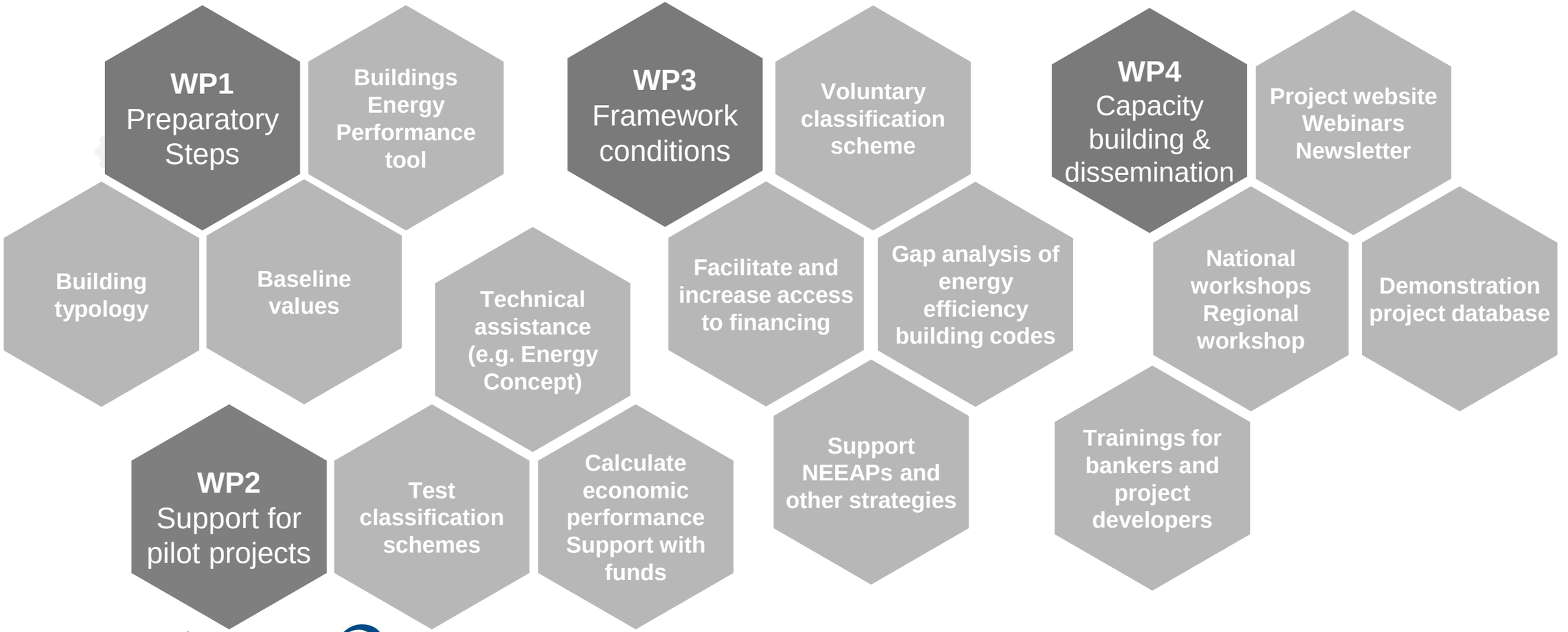
Guidehouse

BUILD_ME

LCEC
LEBANESE CENTER FOR ENERGY CONSERVATION
المركز اللبناني لحفظ الطاقة

BUILD_ME Update

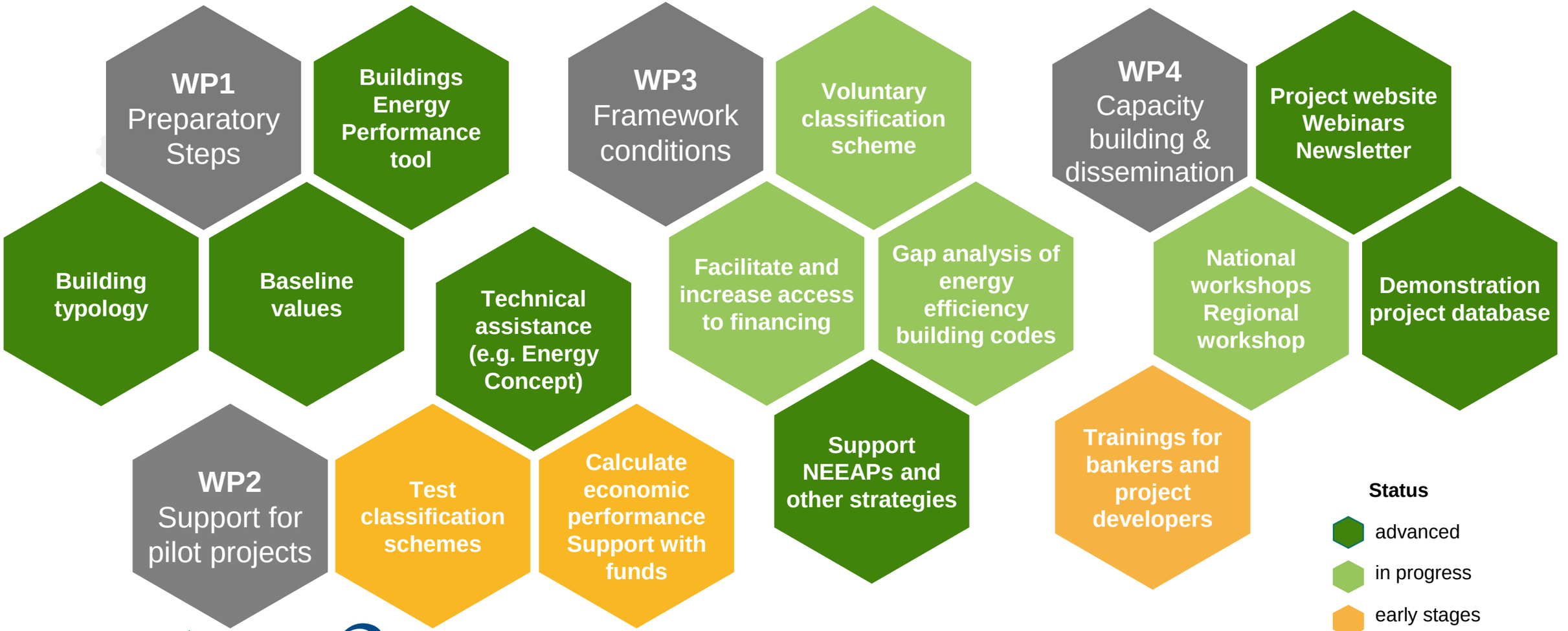
What are we working on?



Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

BUILD_ME Update

Where do we stand after 2020?



Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

BUILD_ME tools and the building sector in Lebanon

Guidehouse

BUILD_ME

LCEC
LEBANESE CENTER FOR ENERGY CONSERVATION
المركز اللبناني لحفظ الطاقة

Building Energy Performance (BEP) tool

Marco Reiser, Guidehouse

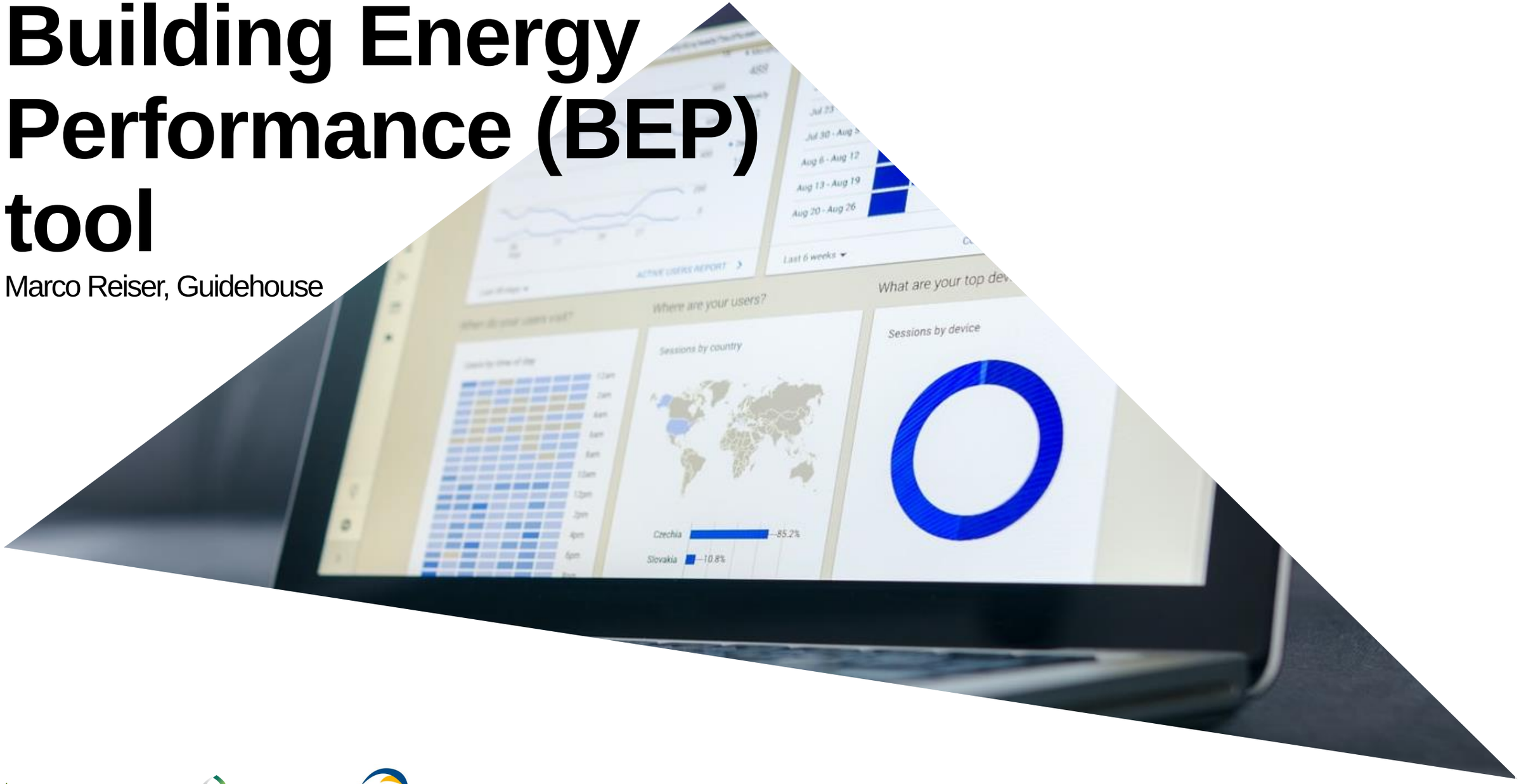


Photo by Lukas Blazek on Unsplash

Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

Building Energy Performance (BEP) Tool

Overview

Performance of energy efficiency measures & RE

- **Energy demand** of building
- Compare to **country's baseline**
- **Energy savings** of efficiency measures
- Use of **renewable energies**

Calculation of monetary savings

- Identify **cost savings**
- Get **cost-optimal** solutions
- **Local market data** for Egypt, Jordan and Lebanon

Free web application

- **Free to use as browser application**
- Optimized for **mobile devices**
- Provides **default input values**
- **Advanced mode** for experienced user

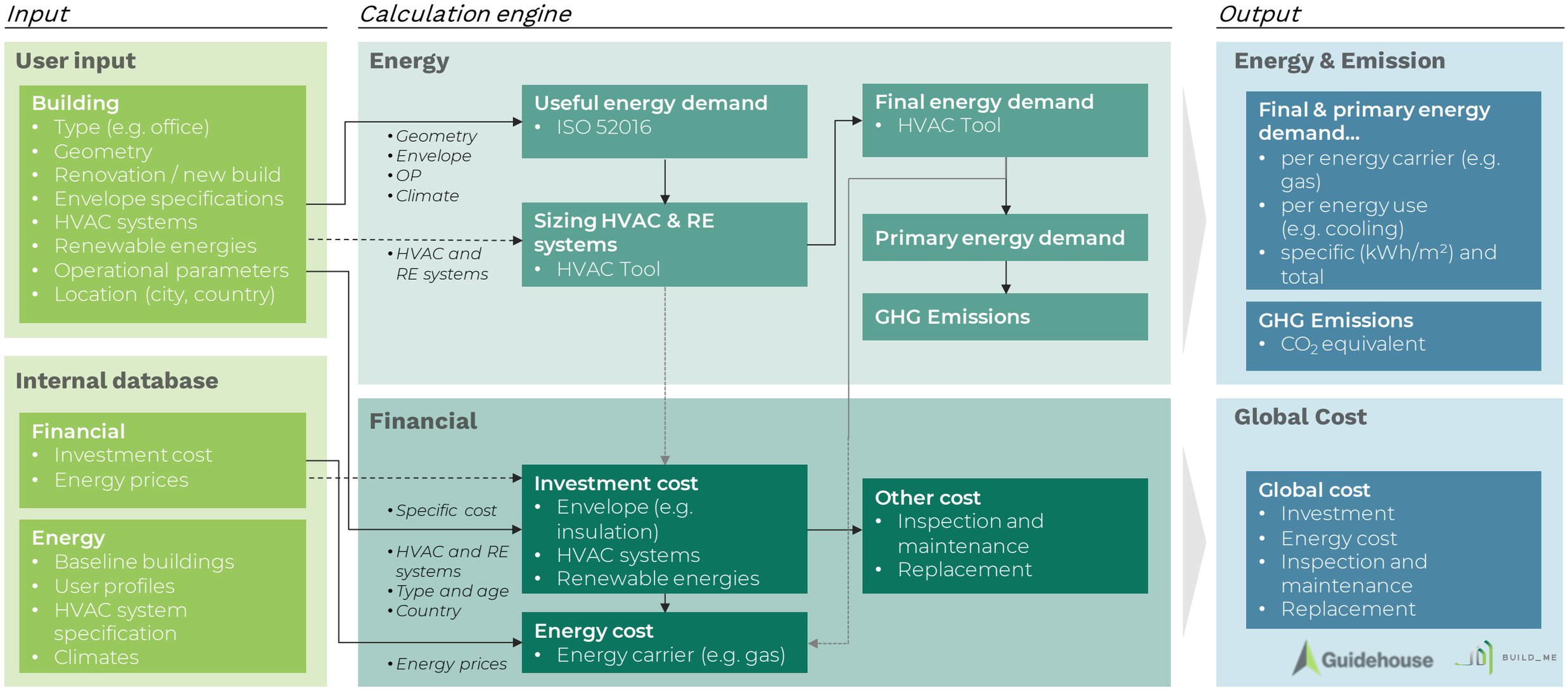
Proven methodology

- **International norm** (EN ISO 52016)
- Already **successfully applied** in various projects
- **Full transparency**

Icons by Eucalyp from www.flaticon.com

Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

BEP calculation methodology



BEP - Developed for the MENA region

Database from **local partners** & **international** calculation methodology

Baseline buildings

Local investment cost & energy prices

Tool was successfully applied in **building projects in the MENA region**

International calculation methodology: ISO 52016

Geographic focus on: **Egypt, Jordan and Lebanon**

Baseline reflects the **country-specific building** standard

BUILD_ME

Methodology is applicable worldwide

Climate data of all countries in the MENA region

Local PEF and CO_2 emission factors

All data input is collected and verified by **local partners** and project developers

The calculation standard is internationally acknowledged.

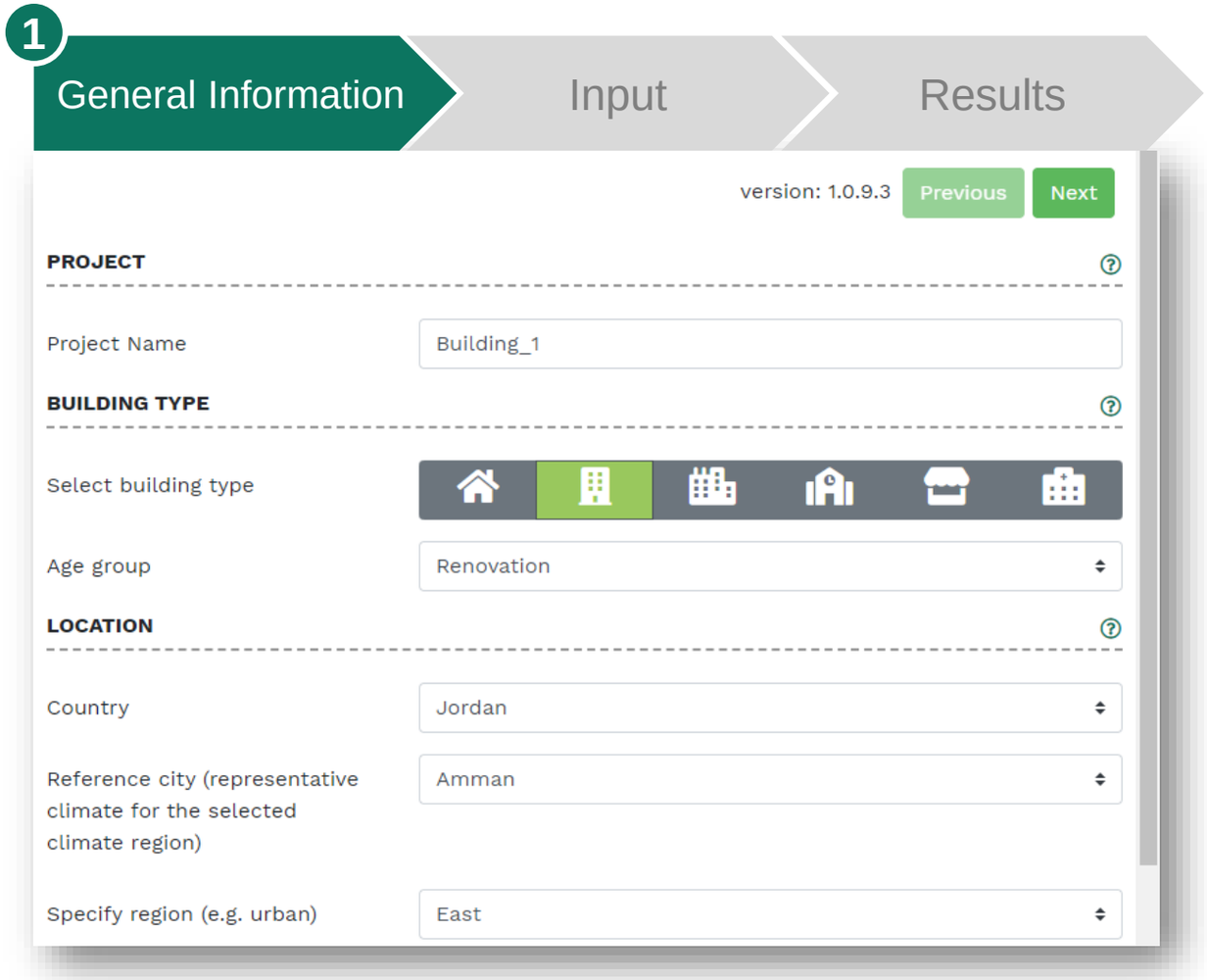
Internal market data **collected from local partners** for Egypt, Jordan and Lebanon

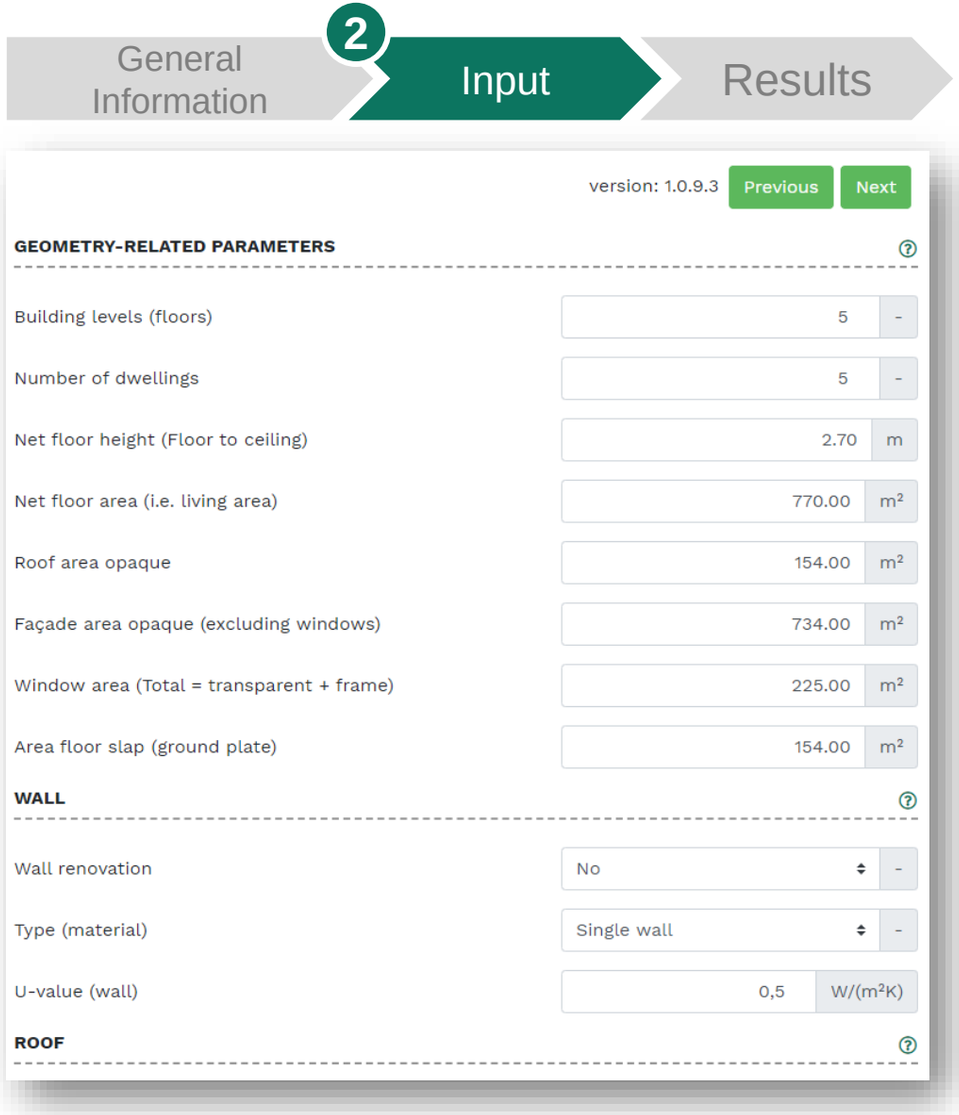
International energy calculation methodology

Country-specific climate data, incl. multiple climate zones within each country

Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

Online Tool - Input





Online Tool – Results

General Information | Input | 3 Results

Home | Tools | Knowledge base | News | About

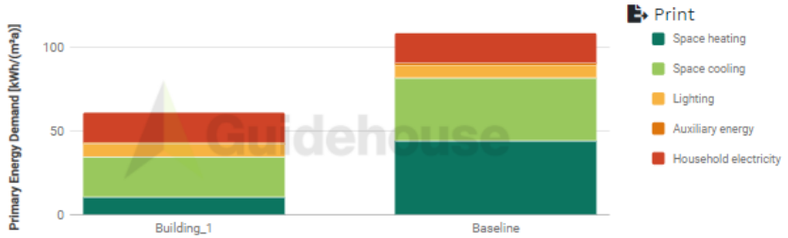
version: 1.0.9.3 Previous Next

Heating: 10.56 kWh/(m²a) | Cooling: 13.37 kWh/(m²a) | Other: 14.91 kWh/(m²a) | Total: 38.84 kWh/(m²a) | Performance: A+

ENERGY & ENVIRONMENT

Primary energy by *energy use* | *Final energy* by *energy use* | *Final energy* by *energy carrier* | *Emissions*

Primary energy demand split in energy use



	kWh/(m²a)		
	Building_1	Baseline	Delta
Space heating	10.56	44.09	-76%
Space cooling	23.98	37.50	-36%
Lighting	7.86	7.86	0%
Auxiliary energy	0.70	1.00	-30%
Household electricity	18.19	18.19	0%
Total	61.29	108.64	-44%
Total incl. PV	61.29	108.64	-44%

FINANCIAL

Specific cost | Total cost | Specific investment cost

Specific cost

	in €/m²		
	Building_1	Baseline	Delta
Investment	26	34	-23%
Replacement	8	12	-35%
Residual	-5	-8	-42%
Energy	163	196	-17%
Inspection & maintenance	3		
Global cost (total)	194	236	-18%

Guidehouse

Online Tool – Results detail

1| Quick overview

The main facts

2| Output selection

4 tabs to select the energy performance indicator

3| Overview chart

Comparison to the baseline building

4| Results table

Detailed results in numbers

5| Baseline building

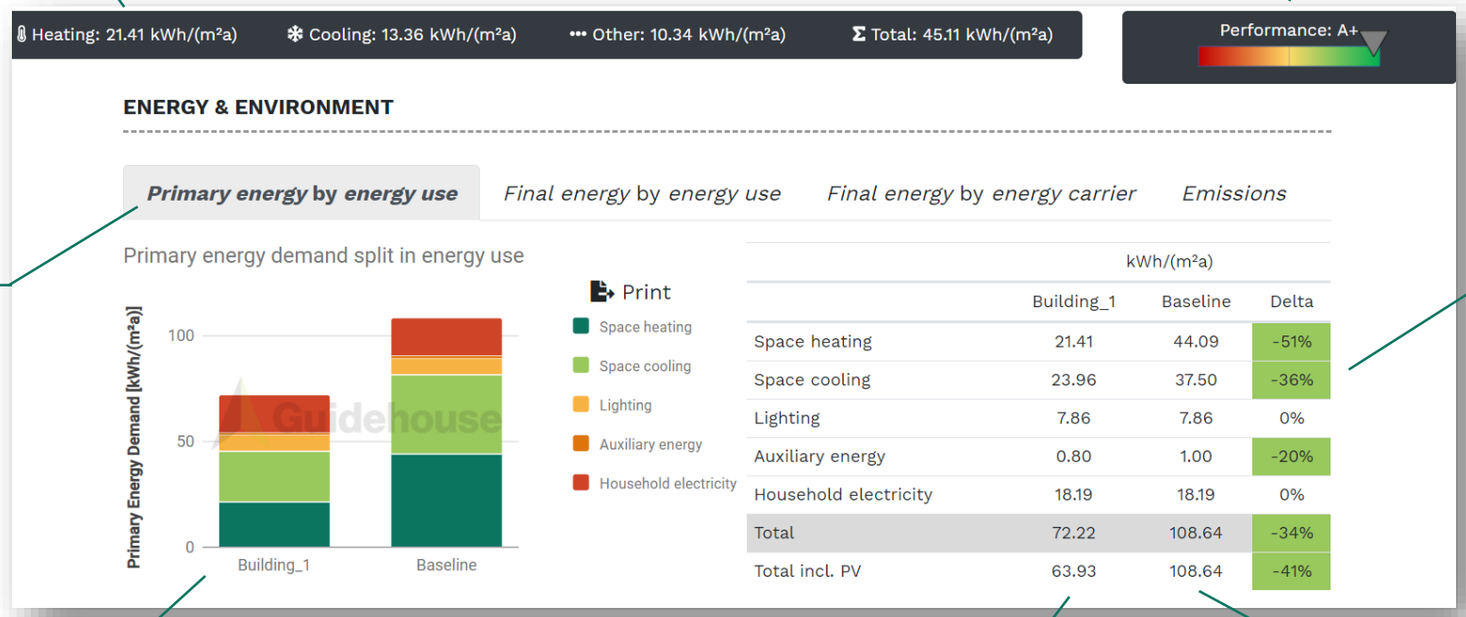
Detailed results of the baseline building

6| Comparison

Difference to the baseline buildings

7| Performance rating

C = equal to baseline



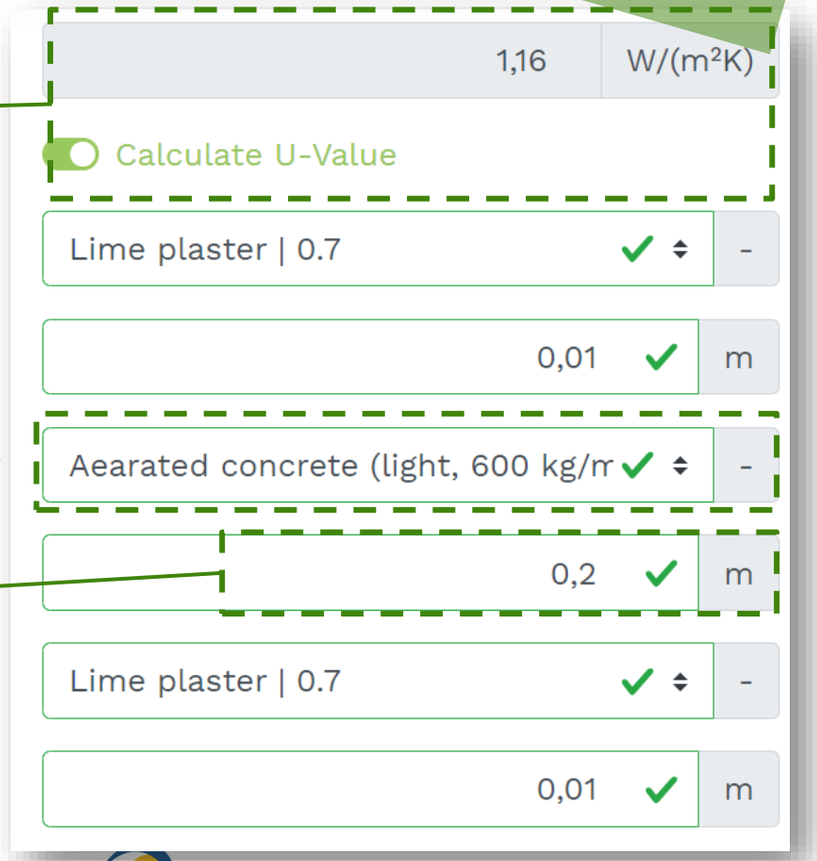
Online Tool – Two new features

Built-in U-Value calculator

3 **Get U-Value**

1 **Select building materials**

2 **Enter thickness of each material**



User-friendly CAPEX / OPEX overview

FINANCIAL - CAPEX / OPEX - OPERATIONAL in €

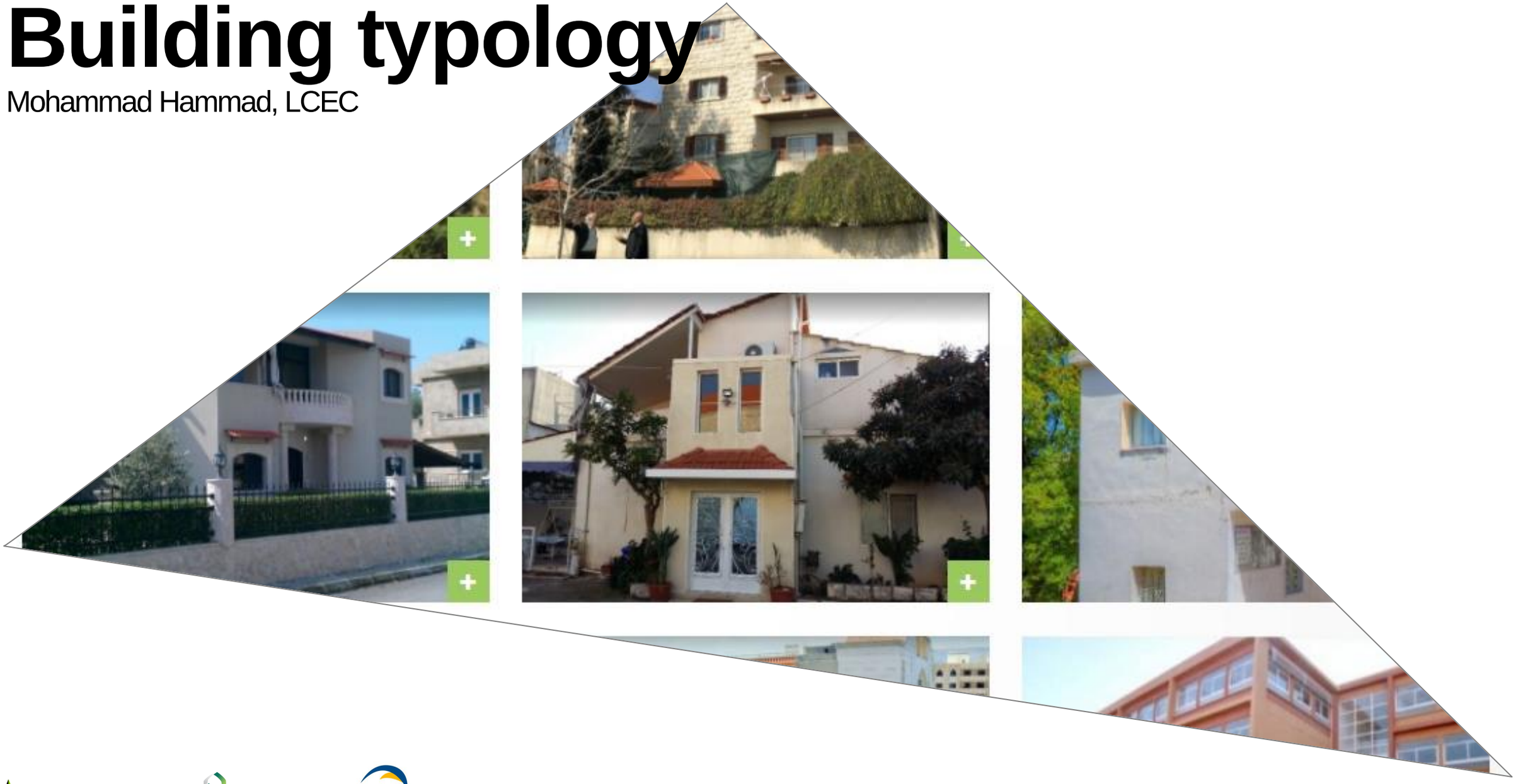
	Current	Baseline	Delta
Heating system	10.761	9.384	-1.377
DHW system	128	128	0
Cooling system	326	326	0
Lighting	2.700	2.700	0
PV system	-	-	-
Ventilation system	-	-	-
Shading system	12.070	12.070	0
Envelope	14.904	20.389	5.485
Energy cost	18.884	16.810	-2.074

Get cost delta of all systems and elements separately

Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

Building typology

Mohammad Hammad, LCEC



Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

Development approach of the building typology

Four main working steps

Template formulation
Prepared by Guidehouse

Data collection
National partners collect data from site visits, stakeholder interviews, literature and databases

Data validation
By Guidehouse and national partners

Reporting > upload on the website

Results and main sections of the template

A : General information

Country	Project Name	Building type	Region (specify)	Construction Period	ID	Reference ID

B: Geometries

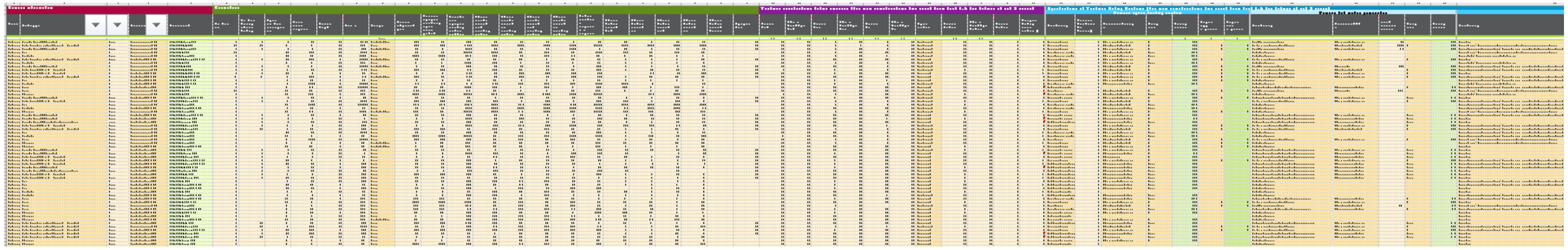
Number of stories	Number of dwellings	Typical number of occupants / users	Net floor area	Clear room height	Volume	Roof type	Area floor slab (ground plate)	Roof area opaque	Façade area opaque	Share of facade oriented north	Share of facade oriented east	Share of facade oriented south	Share of facade oriented west	Window area	Share of windows oriented north	Share of windows oriented east	Share of windows oriented south	Share of windows oriented west	Share of windows oriented horizontal	Opaque doors	Ratio Floor / Ground	Ratio Floor / Roof	Ratio Floor / Facade (excluding windows)	Ratio Floor / Facade (including windows)	A/V

C: Technical specifications building envelope

Thermal heat bridge - Slab	U-value - Roof	Thermal heat bridge - Roof	U-value - Wall	Thermal heat bridge - Wall	Type of window	U-value - Window	Thermal heat bridge - Window	G-value Windows	Avergae shading factor of windows (0-1)

D: Specifications of technical building systems

Primary space heating system	Secondary space heating system	Primary hot water generator	Secondary hot water generator	Primary space cooling system	Secondary space cooling system	Ventilation	Photovoltaics	Lighting	Temperature set-points

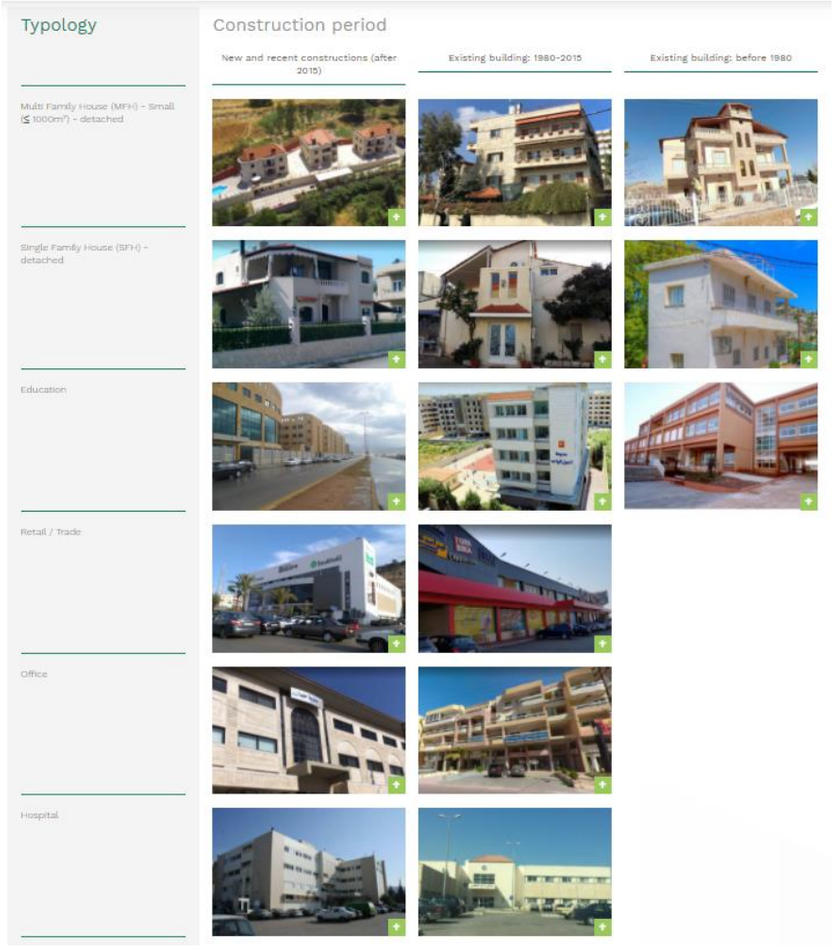


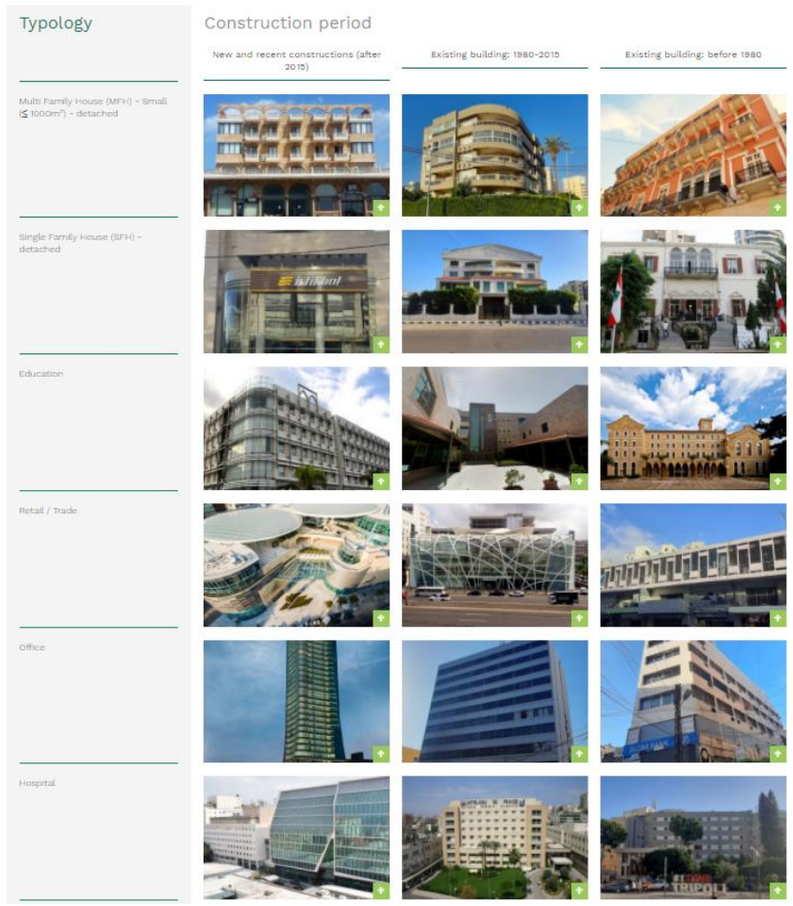
Building typology

Results

Visit: https://www.buildings-mena.com/typologies

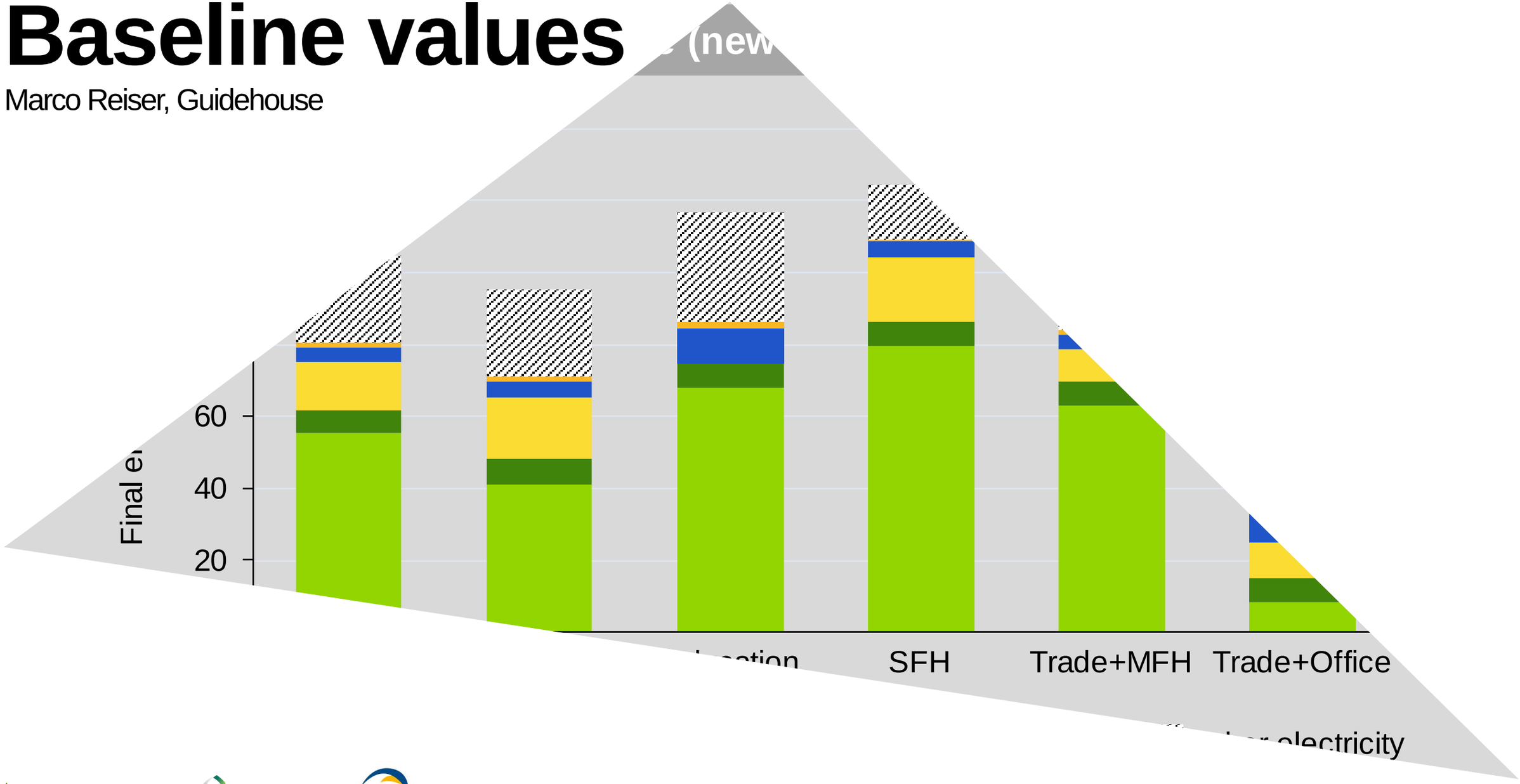
- **Main buildings types**
  - Single Family House (SFH) - detached
  - Single Family House (SFH) - attached
  - Multi Family House (MFH) - Small (≤ 1000m²) - detached
  - Multi Family House / Apartment block - Large (> 1000m²) - detached
  - Education
  - Retail / Trade
  - Office
  - Hospital
- **Construction period**
  - Before 1980
  - 1980 – 2015
  - After 2015
- **Regions**
  - City
  - Town
  - Village





Baseline values

Marco Reiser, Guidehouse



Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

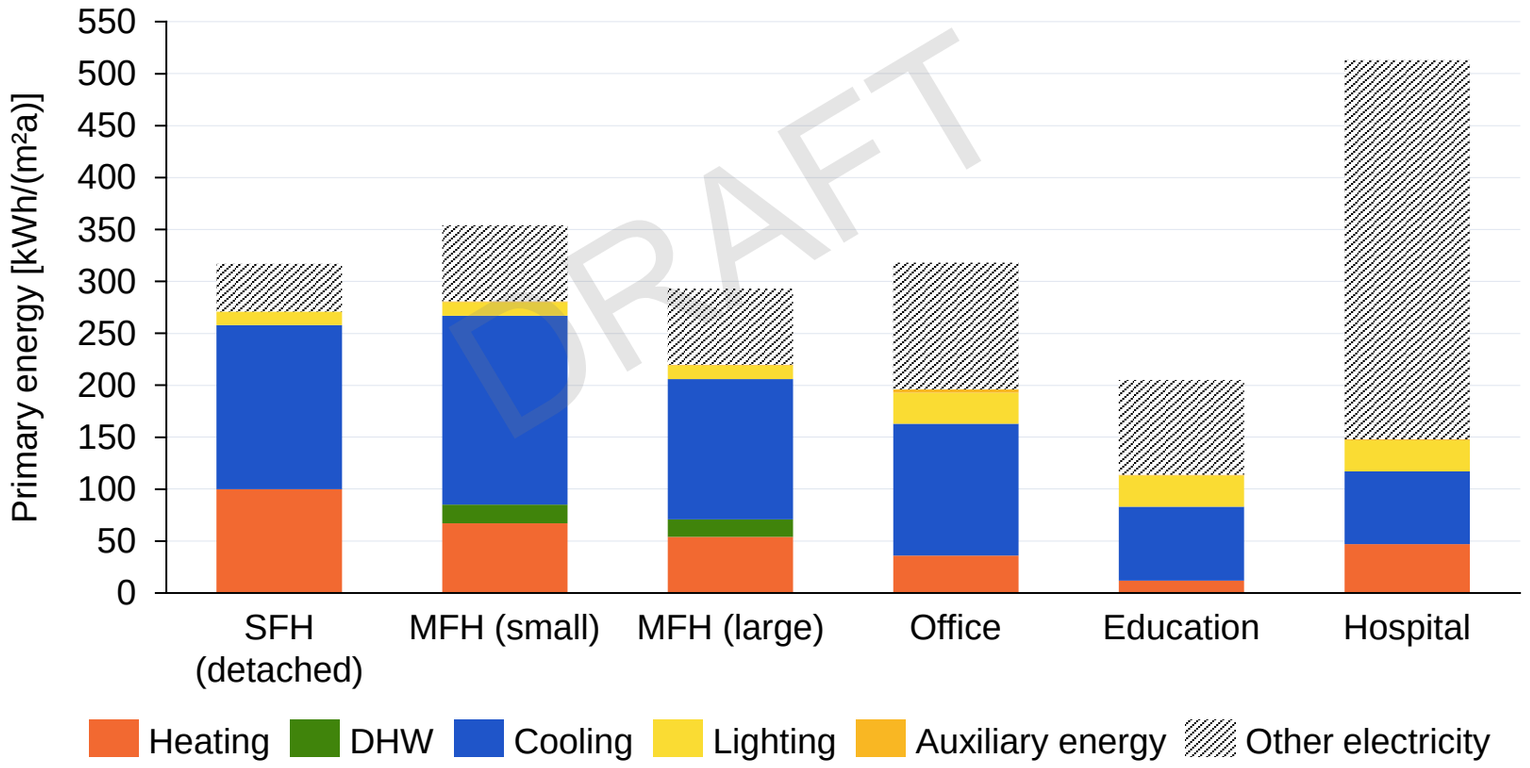
Baseline

Illustrating energy intensity of select Lebanese building types

Key takeaways

- Specific **primary energy** demand ranges between **200 – 500 kWh/(m²a)** for buildings constructed over the past years
- **Space cooling** accounts for largest primary energy demand (due to electricity as energy carrier)
- Note: Other electricity stands for plug-loads (e.g. fridge, TV, etc.) and is informational

“City” baseline (new buildings, after 2015)



Baseline

Illustrating energy intensity: Multi-family house (large)

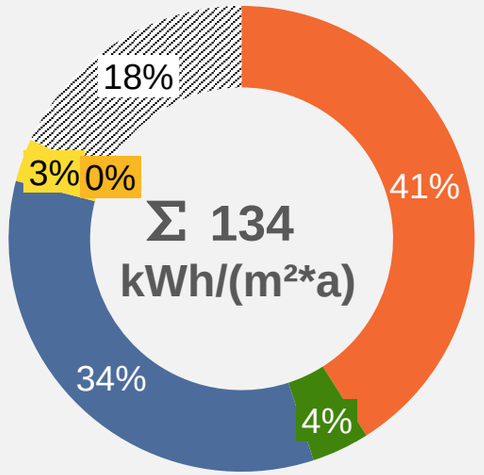
Building standard

- New building in city (constructed after 2015)
- Thermal insulation is used in roof and wall

Final energy demand

- 134 kWh/m²/a (110 kWh/m²a for HVAC and Lighting)
- Energy consumption for heating largest share

Parameters	Baseline
Roof insulation (U-Value)	0.4 W/m²K
Wall insulation (U-Value)	0.6 W/m²K
Floor insulation (U-Value)	2.2 W/m²K
Windows (U-Value; G-Value)	5.7 W/m²K; 0.85
Window fraction	Ø 45%
Shading	Fixed shading
Air tightness	0.25 1/h
Heat supply	Oil (non-condensing)
Cold supply	Single split (EER: 2.9)
Hot water	Direct electric
Ventilation systems	Free ventilation
Lighting systems	LED
Renewable energy	No
Set temperature cooling/heating	22°C / 21°C



Energy cost
7.7 EUR / (m²*a)

CO2 - emission
3.4 kg / (m²*a)

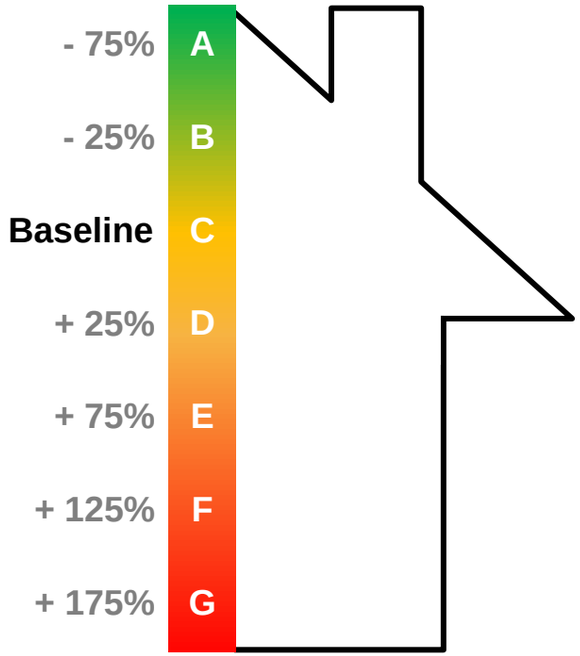
Baseline

Next steps, development of classification scheme

Classification scores for BUILD_ME building types

Class	Term	Score
A	Nearly zero energy building	<0.25
B	High performance building	0.25 - 0.75
C	Average new construction	0.76 - 1.25
D	Stock, better quality	1.26 - 1.75
E	Stock, medium quality	1.76 - 2.25
F	Stock, poor quality	2.26 - 2.75
G	Stock, urgent renovation demand	>2.75

Application of the classification score to baseline level



Methodology behind the BUILD_ME classification

- Classification logic is based on the European energy performance certificates of buildings norm [EN 15217]
- Adapted with feedback from financial institutes active in the markets and findings of the building typology
- Baseline (new buildings energy consumption) is equal to Class C (score of 1.0)

BUILD_ME Assessment and Recommendations for the NEEAP 2021-2025

Ms. Patil Mesrobian, LCEC

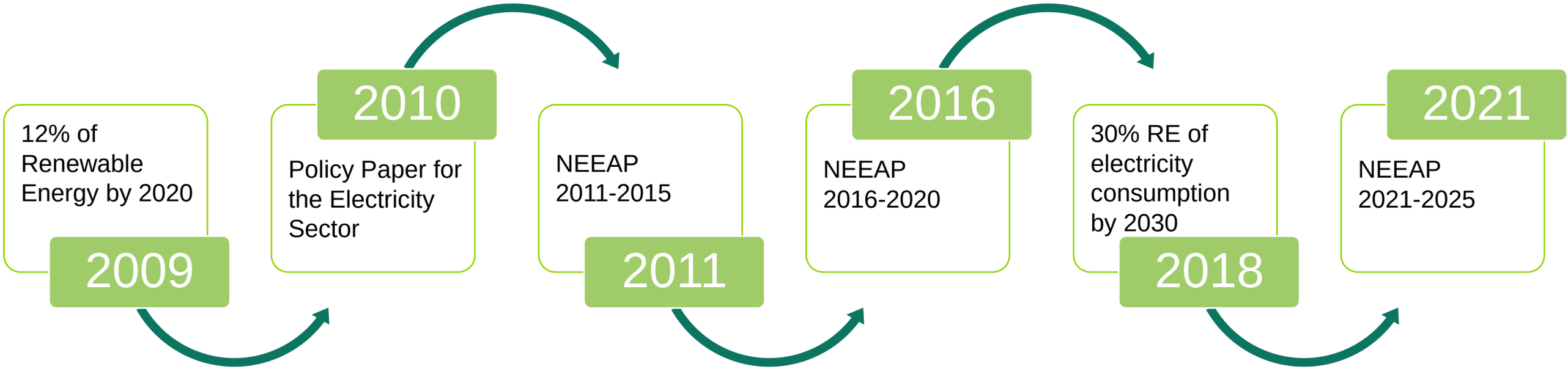
Guidehouse

BUILD_ME

LCEC
LEBANESE CENTER FOR ENERGY CONSERVATION
المركز اللبناني لحفظ الطاقة

Introduction

Status quo: background and targets



Introduction

NEEAP Evaluation

Evaluate the building specific measures of NEEAP 2016-2020

Develop recommendations for the next Lebanese NEEAP (2021-2025)

Status Quo

National and local efficiency strategies in Lebanon

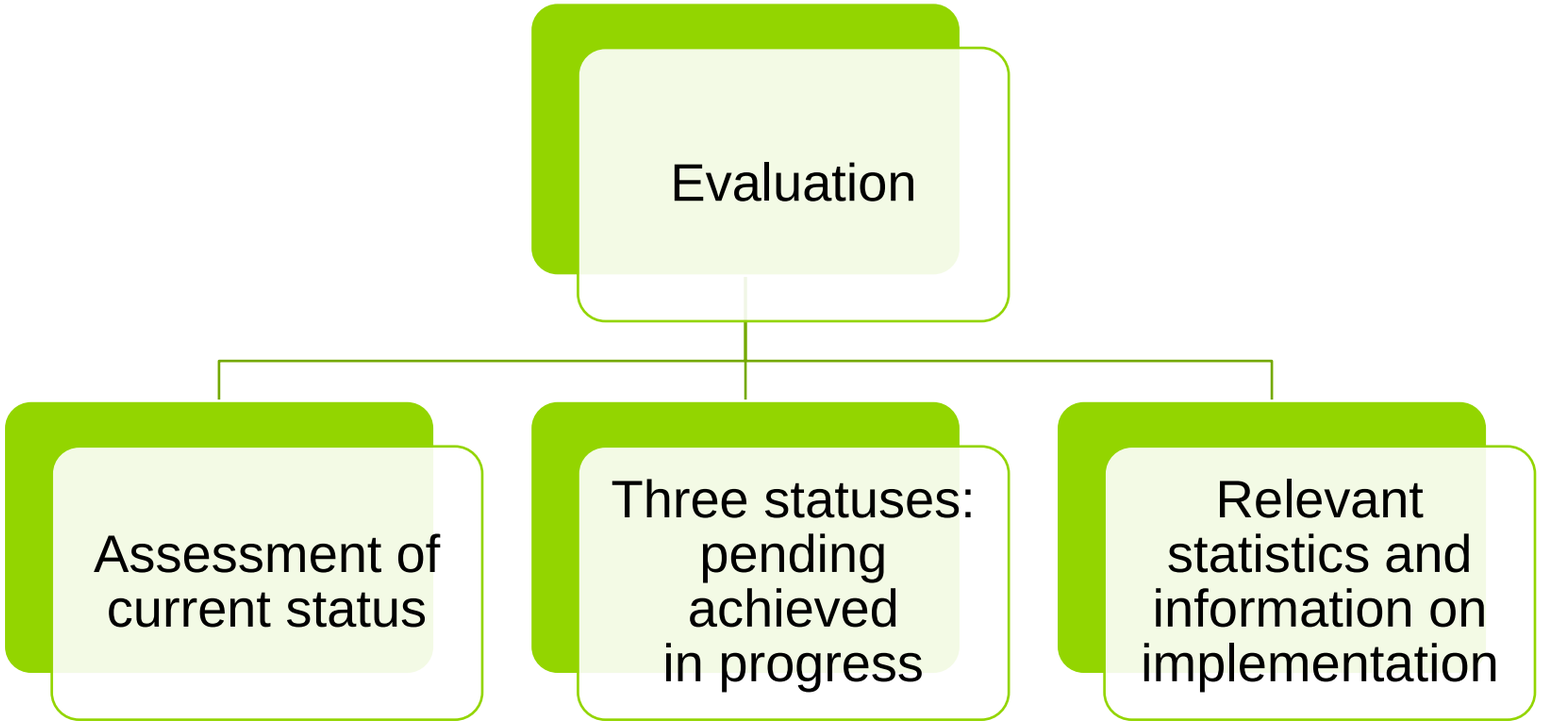
- Lebanon is facing a **diversity of crises**: economic, financial, and political, in addition to the COVID-19 pandemic and its associated lockdowns since March 2020 plus the tragic explosion at the Beirut port on 4 August 2020
- Existing crisis of **electricity blackouts and energy shortages** stress the importance to scale up efforts in the energy efficiency in the building sector

NEEAP 2011-2015 and NEEAP 2016-2020 included major initiatives that covered all sectors and tackled both the energy generation and the end-user consumption.

Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

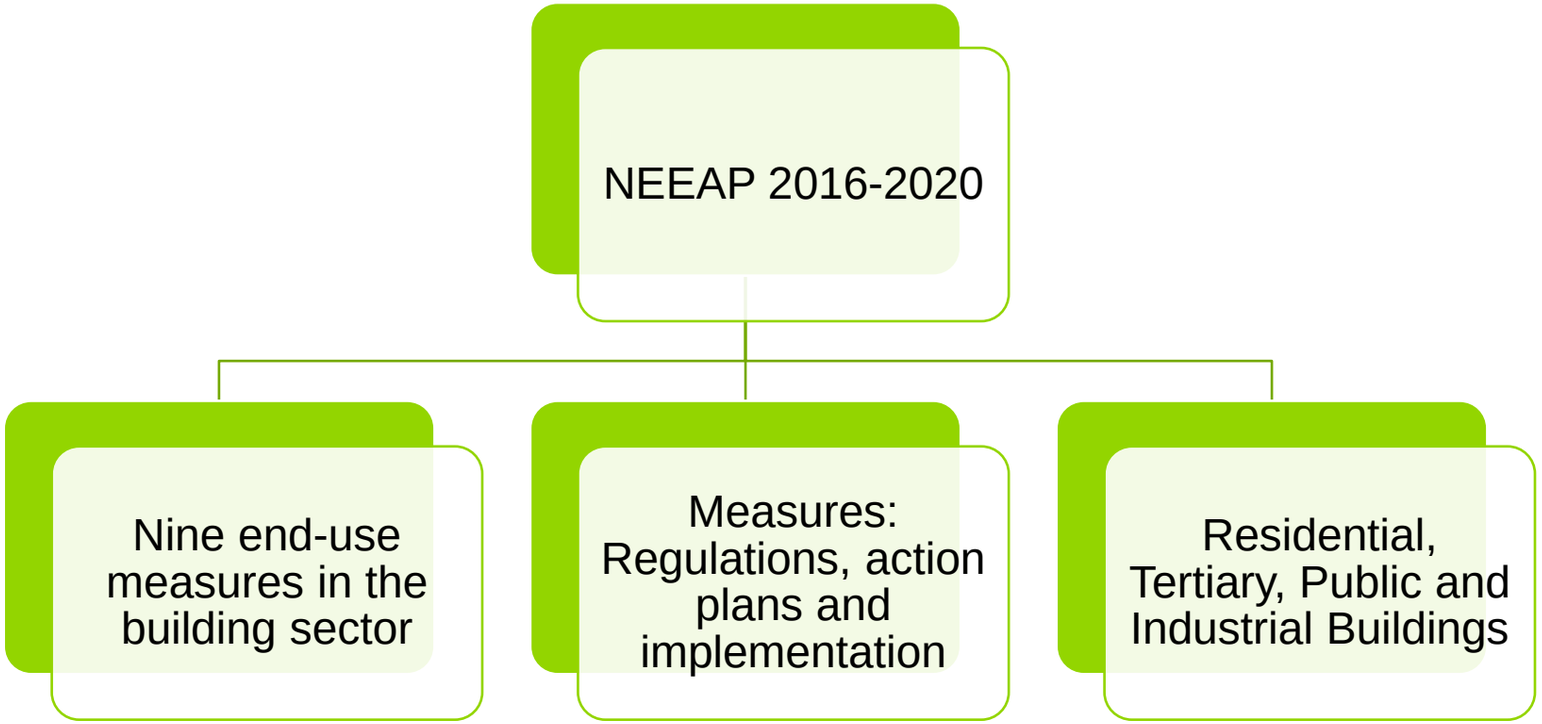
Evaluation of the 2nd NEEAP 2016-2020

Evaluation Methodology



Evaluation of the 2nd NEEAP 2016-2020

Evaluation Scope



Evaluation of the 2nd NEEAP 2016-2020

In progress

- Double wall ordinance
- Testing facility for building construction material
- Building code
- Use of efficient equipment
- Energy performance certificate for buildings
- Energy audits for public buildings
- Implementing EE measures in selected public buildings
- Capacity building for refurbishment

Pending

- Pilot Project

Evaluation of the 2nd NEEAP 2016-2020

Measure 1: Double wall ordinance

Short description of measure
Set the double wall ordinance that improves a building's envelope performance Implement the ordinance in 100 buildings (total floor area of 100,000 m^2).
Ongoing activities
The adoption of a double wall ordinance is currently still in the legislative process. The ordinance has been implemented in 100 buildings, mostly through the NEEREA financing mechanism.
Suggestion for further development
Accelerate the legislative process and the engagement of stakeholders.

Evaluation of the 2nd NEEAP 2016-2020

Measure 2: Testing facility for building construction material

Short description of measure
This measure aims to set up a test facility able to assess the thermal properties of building components and certification of components
Ongoing activities
The testing facility was installed at the Faculty of Engineering of the Lebanese University. It requires an additional upgrade.
Suggestion for further development
The testing facility requires additional funding for upgrade and completion

Evaluation of the 2nd NEEAP 2016-2020

Measure 3: Building code

Short description of measure
This measure aims to improve the energy efficiency standard of new buildings.
Ongoing activities
A report to improve the existing building thermal standards including an analysis of the Thermal Standards for Buildings in Lebanon (TSBL 2005), which is the only thermal standard for buildings available in Lebanon is currently being prepared. Building Environmental Performance- Principles, Requirements and Guidelines by LIBNOR
Suggestion for further development
This building code should be mandatory for all new buildings. A concept on how to ensure the monitoring and enforcement of the building code should be developed.

Evaluation of the 2nd NEEAP 2016-2020

Measure 4: Use of efficient equipment

Short description of measure
Using energy-efficient equipment in 200 buildings of 1,000 m^2 each.
Ongoing activities
Activities by the LCEC to incentivize all stakeholders to promote energy-efficient home appliances. NEEREA approved projects
Suggestion for further development
More awareness campaigns and incentives targeting consumers Promote the use of energy efficient equipment and the available financing schemes, awareness campaigns should also be conducted for retailers, as they are in direct contact with consumers.

Evaluation of the 2nd NEEAP 2016-2020

Measure 5: Energy performance certificate for buildings

Short description of measure
Establishing a system of certification and labeling of the energy performance of buildings and setting minimum energy performance requirements for new buildings.
Ongoing activities
Development of a concept for a voluntary energy performance classification scheme for buildings within the BUILD_ME project.
Suggestion for further development
Incentivize property owners to improve performance of building. Steps for a mandatory scheme

Evaluation of the 2nd NEEAP 2016-2020

Measure 6: Energy audits for public buildings

Short description of measure
Performing energy audits for 200 public buildings
Ongoing activities
Ongoing activities for energy audits
Suggestion for further development
push further the performance of energy audits by proposing an additional measure that promotes the implementation of Energy Performance Contracts, targeting public buildings in general, and the municipalities in particular.

Evaluation of the 2nd NEEAP 2016-2020

Measure 7: Implementing measures in selected public buildings

Short description of measure
Implementing energy efficiency measures in select public buildings
Ongoing activities
"BIM for Energy Efficiency in Public buildings – BEEP" - to enhance energy efficiency in buildings. "Energy Smart Mediterranean Schools Network - ESMES" - renewable energy and energy efficiency rehabilitation measures in public schools Both projects are funded by ENI CBC MED Programme
Suggestion for further development
This measure should be further specified and supplemented by quantifiable indicators. It should also be expanded further from "selected public buildings" to a more structured approach.

Evaluation of the 2nd NEEAP 2016-2020

Measure 8: Capacity building for refurbishment

Short description of measure
Educate and train workers on best practices in the renovation of buildings with a focus on measures to improve energy efficiency towards sustainable concepts.
Ongoing activities
Several workshops held aimed at increasing capacity building on measures to improve energy efficiency.
Suggestion for further development
Capacity building on the best practices in the energy management and renovation of the building sector should be continuously supported and promoted.

Evaluation of the 2nd NEEAP 2016-2020

Measure: Pilot project (pending)

Short description of measure
Building an exemplary green building
Ongoing activities
On hold due to legal and financial obstacles
Suggestion for further development
NA

Outcomes of the NEEAP Evaluation

- Technical and institutional capacity is strong
- Lack of regulations in the electricity sector
- Lack of awareness related to EE technologies, high upfront investments and missing standards

Recommendations for NEEAP 2021-2025

Package 1: Get the basics right	Package 2: High performance
Measures with low investment	More advanced measures
Good effectiveness on energy savings	High energy savings
Fast payback period	More financial resources
Basis for more ambitious measures	Greater barriers

Recommendations for NEEAP 2021-2025

Package 1: Low investment and fast payback

Optimization of existing systems

Measure 1: Decreasing cooling demand by installation of solar shadings

Measure 2: Lighting and automation

Recommendations for NEEAP 2021-2025

Package 1: Low investment and fast payback

Information and training on financing EE projects

Measure 1: Raise awareness of the end user on benefits of energy efficient and renewable energy solutions in the building sector

Measure 2: Offer training and capacity building to support bank officers in understanding the context and business opportunities of Energy Efficiency lending

Measure 3: Implement faster methods for loan approvals

Recommendations for NEEAP 2021-2025

Package 1: Low investment and fast payback

Mandatory standards for energy efficient equipment

Measure 1: Enforce mandatory energy performance standards for heating and cooling equipment being imported in the country

Measure 2: Incentivize suppliers to import energy efficient technologies by facilitating import procedure

Measure 3: Build capacity at the supplier's floor staff level on the benefits of energy efficient technologies imported in the country

Measure 4: Promote heat recovery system on diesel generators

Recommendations for NEEAP 2021-2025

Package 1: Low investment and fast payback

Awareness raising and training for EE in buildings

Measure 1: Energy performance Classification for buildings

Measure 2: Awareness campaigns to inform public about EE benefits and how to proactively save energy

Measure 3: Capacity building for refurbishment

Measure 4: Empower customers with access to information

Measure 5: Pay as you go meters

Recommendations for NEEAP 2021-2025

Package 2: More advanced measures delivering high energy savings

Mandatory standards for EE in new constructions

Measure 1: Building code to improve the energy efficiency standard of new buildings

Measure 2: Reduce window fraction of new constructions

Measure 3: Set a requirement for advance modelling and energy simulations of new buildings

Measure 4: Strengthen enforcement systems in the construction and maintenance phase

Recommendations for NEEAP 2021-2025

Package 2: More advanced measures delivering high energy savings

Improving energy efficiency in public buildings

Measure 1: Implementing measures in selected public buildings

Measure 2: Energy audits for public buildings

Measure 3: Implementation of Energy Performance Contracts within the public sector

Recommendations for NEEAP 2021-2025

Package 2: More advanced measures delivering high energy savings

(Financial) incentives for energy efficiency

Measure 1: Regulate laws that enable municipalities to offer incentives for energy efficient buildings beyond the double wall ordinance

Measure 2: Differentiate financial incentives between energy efficiency projects, offering highest incentives for projects with highest ambition, and distribute a standard economic tool that can benchmark applications

Measure 3: Use of efficient equipment

Recommendations for NEEAP 2021-2025

Package 2: More advanced measures delivering high energy savings

Research & Development

Measure 1: Complete a comprehensive assessment/feasibility study for a district cooling pilot project for a cluster of buildings in Lebanon

Measure 2: Empower R&D facilities within academic institutions targeting energy efficiency technologies

Recommendations for NEEAP 2021-2025

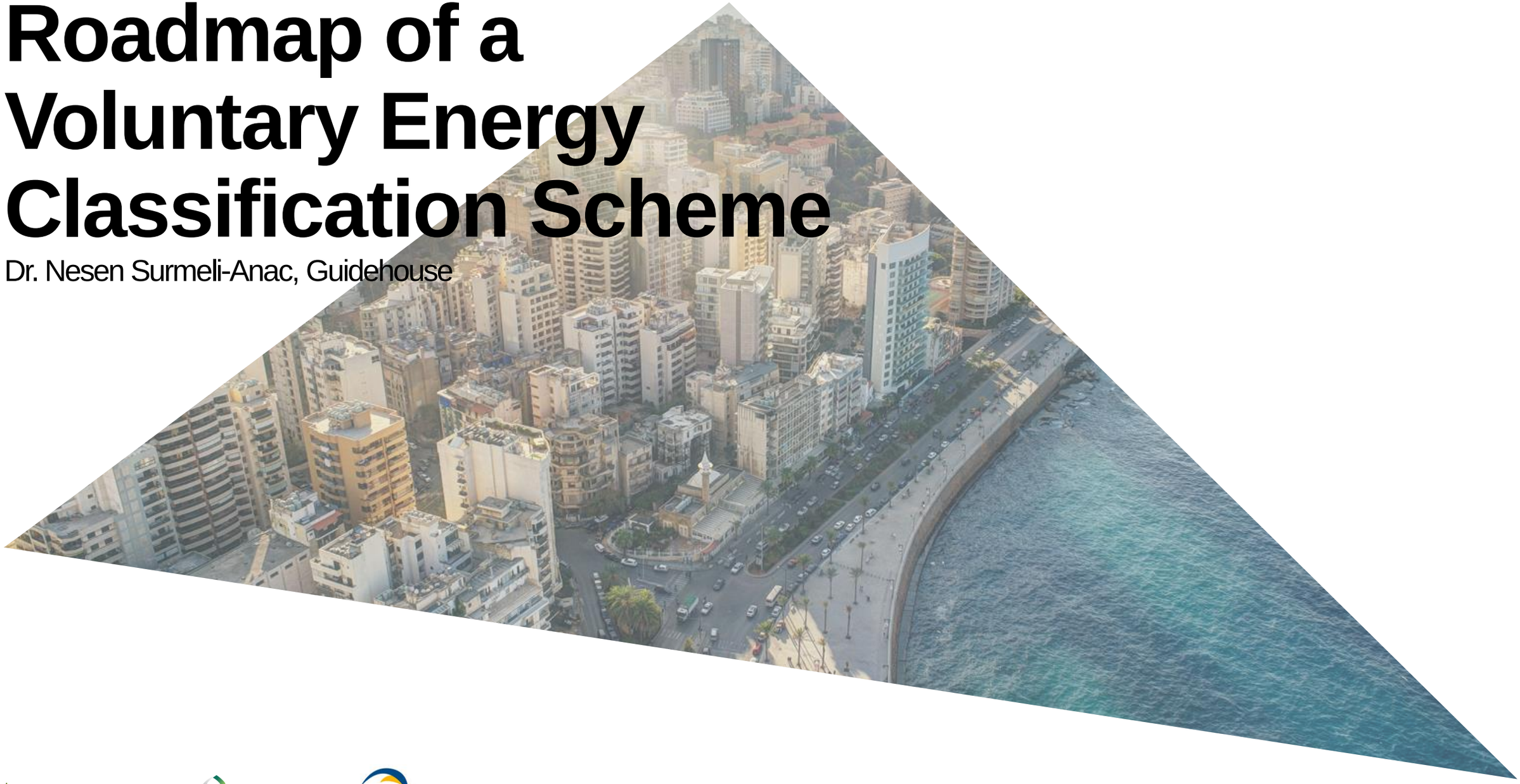
Package 2: More advanced measures delivering high energy savings

Quantification of impact assessment of the recommendations

Integration of measures in NEEAP 2021-2025

Roadmap of a Voluntary Energy Classification Scheme

Dr. Nesen Surmeli-Anac, Guidehouse



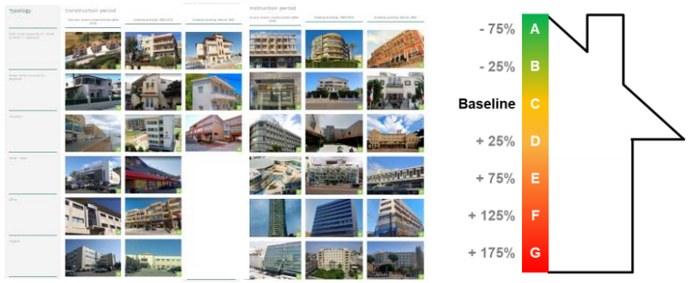
Guidehouse

BUILD_ME

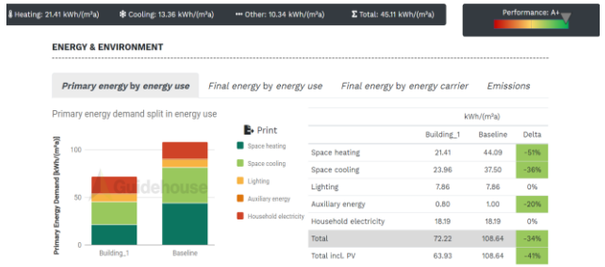
LCEC
LEBANESE CENTER FOR ENERGY CONSERVATION
المركز اللبناني لحفظ الطاقة

Voluntary Energy Classification Scheme in Lebanon

Starting point and objective



BUILD_ME Building Typology
considering the prepared typology as a baseline



Building Energy Performance Tool
(BEP) tool as a calculation method considering local market information

Systems of national institutions

Requirements local banks

Adaptability to national context
Considering country needs and managerial infrastructures

Establishment of a national energy classification scheme

Ensure implementation and ownership of the scheme beyond BUILD_ME

Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

Problem statement

How to develop a well functioning classification scheme utilizing the BEP Tool in the Lebanese built environment?

Aiming for an independent scheme

- Develop a stand-alone scheme
- Quantitative calculation module for energy performance; BEP tool as a scientifically proven method
- A clear focus only on energy

Concept and Operation

What are the design options for the scheme? What is the operational framework? Certification and labelling process?

Verification

How is verification, monitoring, surveillance and enforcement done?

Testing

Testing and roll out? Evaluation and updates to the scheme?

Ownership

Evaluation and ownership of updating the scheme?

Classification Scheme concept and operation

Target market

Building Age

New Buildings only

Data readily available

Excludes the most inefficient part of the building stock.

All existing buildings

Fully addresses the building stock

Timing/opportunity to get certified is not convenient (unless there is a change of ownership or tenant)

Data is not readily available

Building type

Selected types (e.g. residential)

Simplicity

Residential buildings provide maximised coverage of the stock

If selection is too narrow the potential for energy savings are reduced

Multiple types

Fully addresses the building stock

Maximizes the potential energy savings

Complexity

Potential need for multiple benchmarks

Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

Classification Scheme concept and operation

Deriving energy performance

As designed

A one-off calculation.

Allows for grading of performance on the basis of achievement (at or above the national building standard)

Does not take account of the differences between actual energy use and as designed.

As built

Gives a more realistic view of the energy demand of a building

Would allow building users understand the impact of their behaviour on the energy use

Periodic updating (ideally annual) needed.

Ideally needs benchmarks or corrections in order to ‘grade’ performance of different buildings.

Combination of as designed and as built

Maximises potential positive influence of the scheme by providing both values.

Transparency gives added value

Disclosure of actual energy consumption is difficult to interpret

The designed and built performance can differ dramatically. A good explanation to the public will be needed.

Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

Classification Scheme concept and operation

Centralized database

Fully public

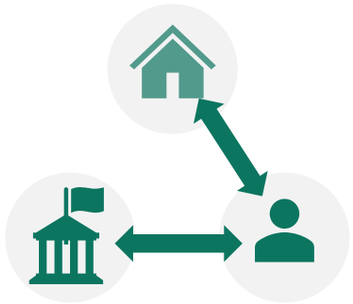
Low costs for the private sector

Expected higher uptake than if fully commercial

Higher costs for the public sector

Adds to the scheme owner's administrative burden

Outsourced but publicly funded



Management of the registration system and disclosure might be more efficient than if fully public.

Low costs for the private sector

Creation of a new market for businesses

Expected higher uptake than if fully commercial

Coverage of costs need to be answered

Third party commercial system

Less administrative burden for the public sector and the scheme owner

Expected good management and services

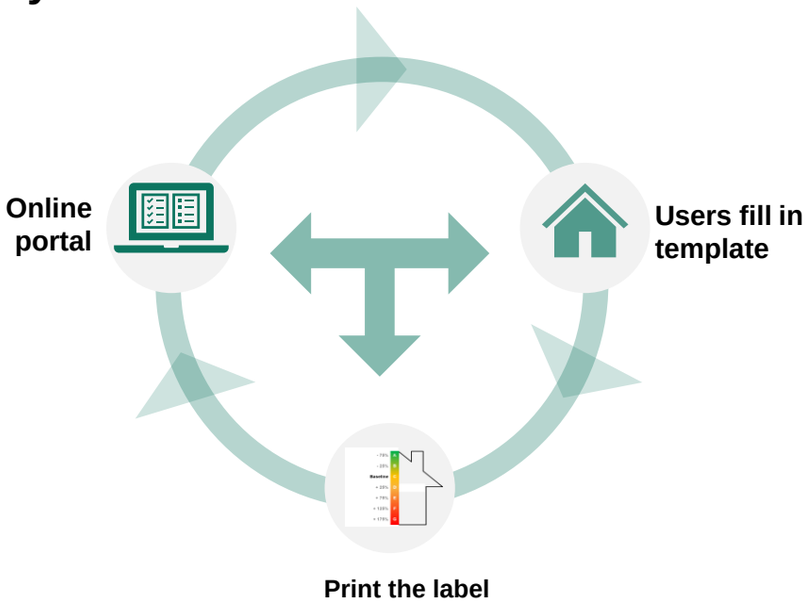
Risk of lower-than-expected uptake if costs are higher than if publicly financed

Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

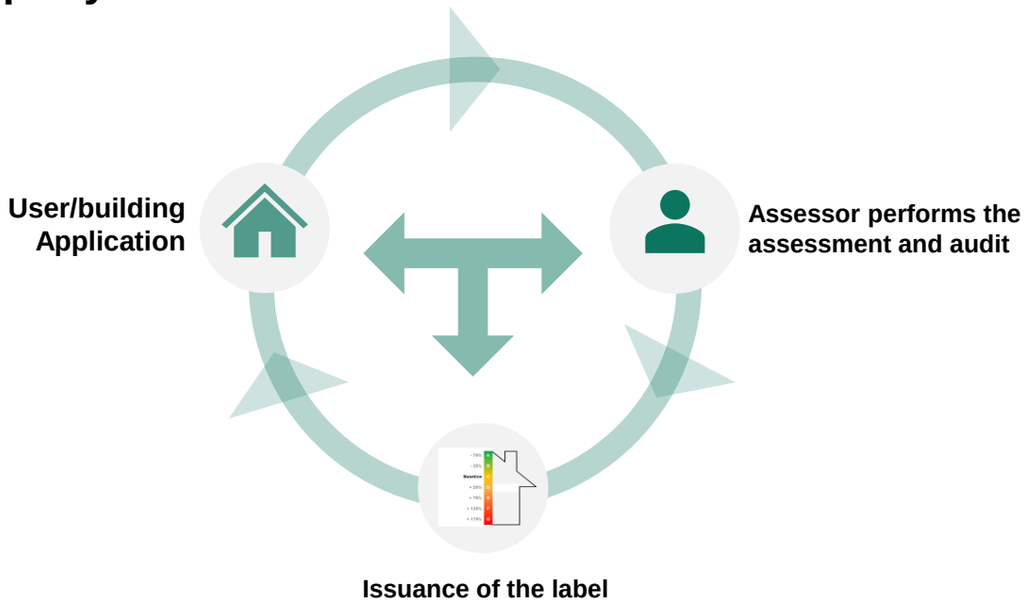
Classification Scheme concept and operation

Certification options

First-party certification



Third-party certification



(+) Low costs due to online tool and pre-set requirements	(+) Most effective
(+) Straight forward for users	(+) Highest reliability
(-) Less credible	(-) Higher investment
(-) Least effective	(-) Higher operation costs

Voluntary Energy Classification Scheme

Main conclusion and expected impacts

Market uptake

Boosting market uptake for voluntary classification system.

Balance

Reaching required balance between technical complexity and accessibility of certification system.

Accessibility

Establishing a practical, accessible and affordable national classification scheme

Diving into the demonstration project database (DPD)

Mohammad Hammad, LCEC

Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

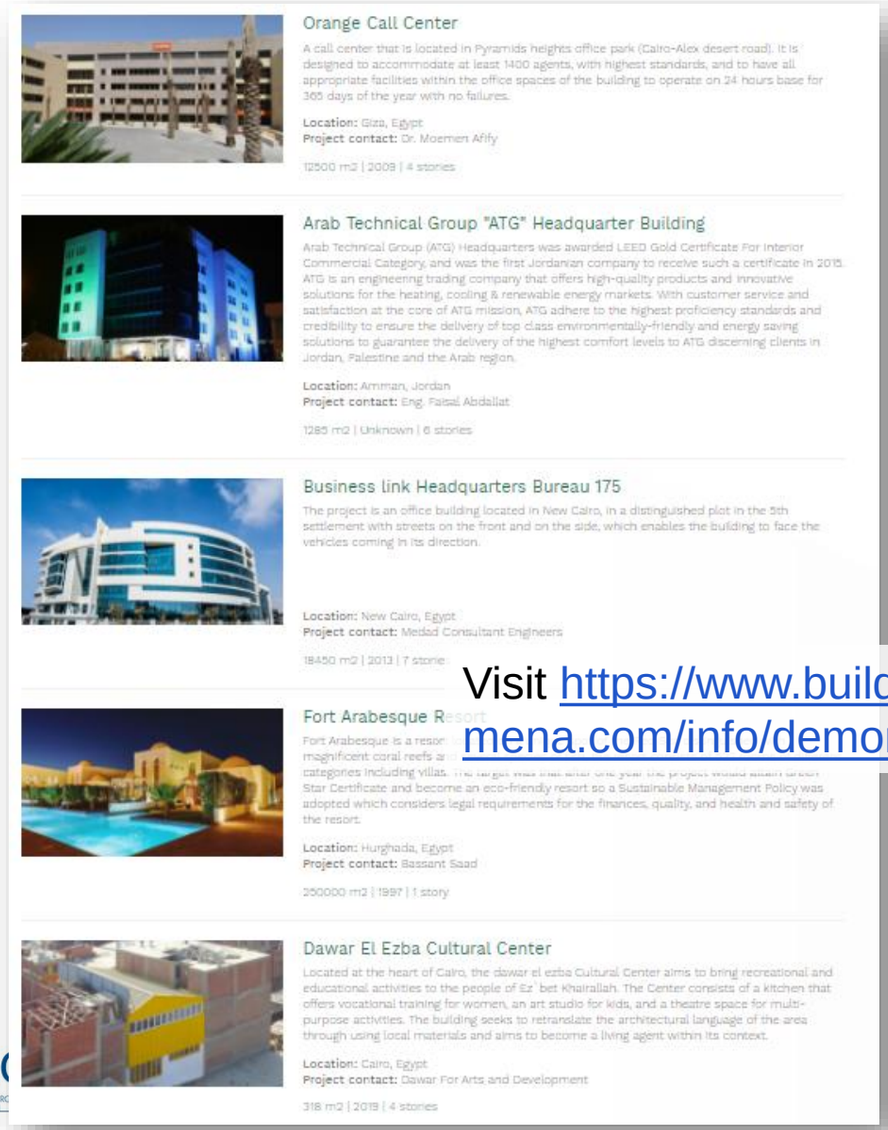
Demonstration project database

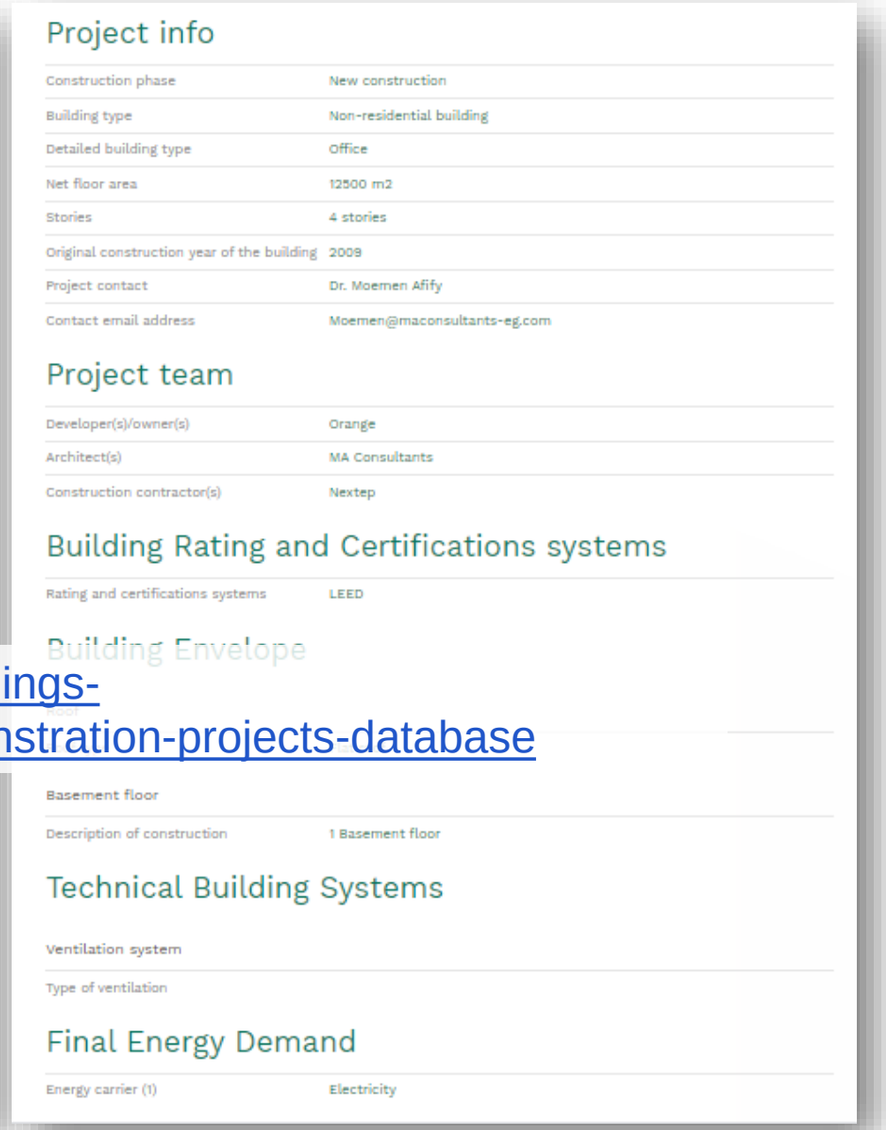
Crowd-sourced examples from the region

Register and add a project

ADD NOW!

- Searchable database of practical inspiration
- Welcome input from project developers, architects or contractors from across the region
- Currently approx. 50 examples



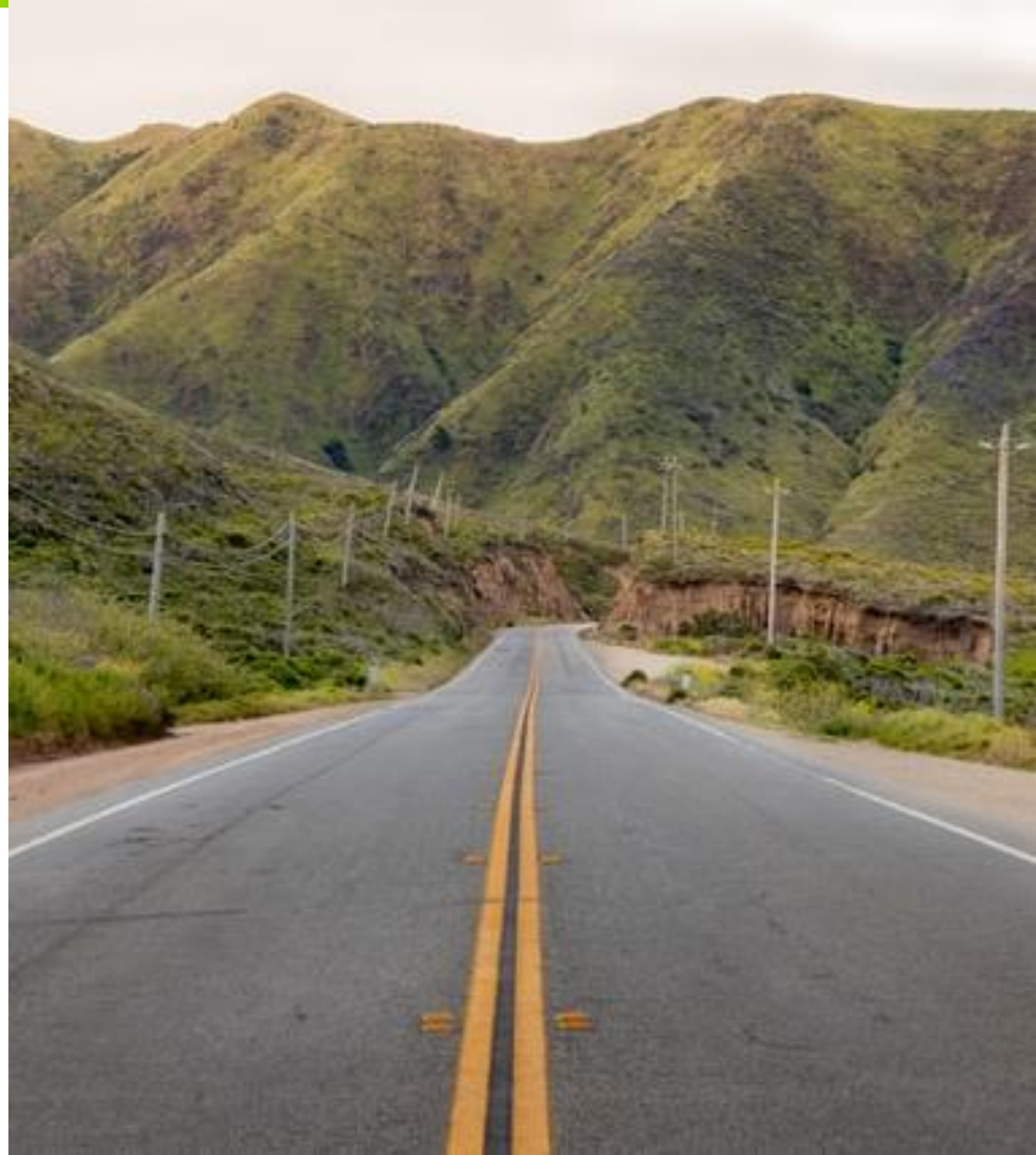


Visit https://www.buildings-mena.com/info/demonstration-projects-database

Guidehouse BUILD_ME

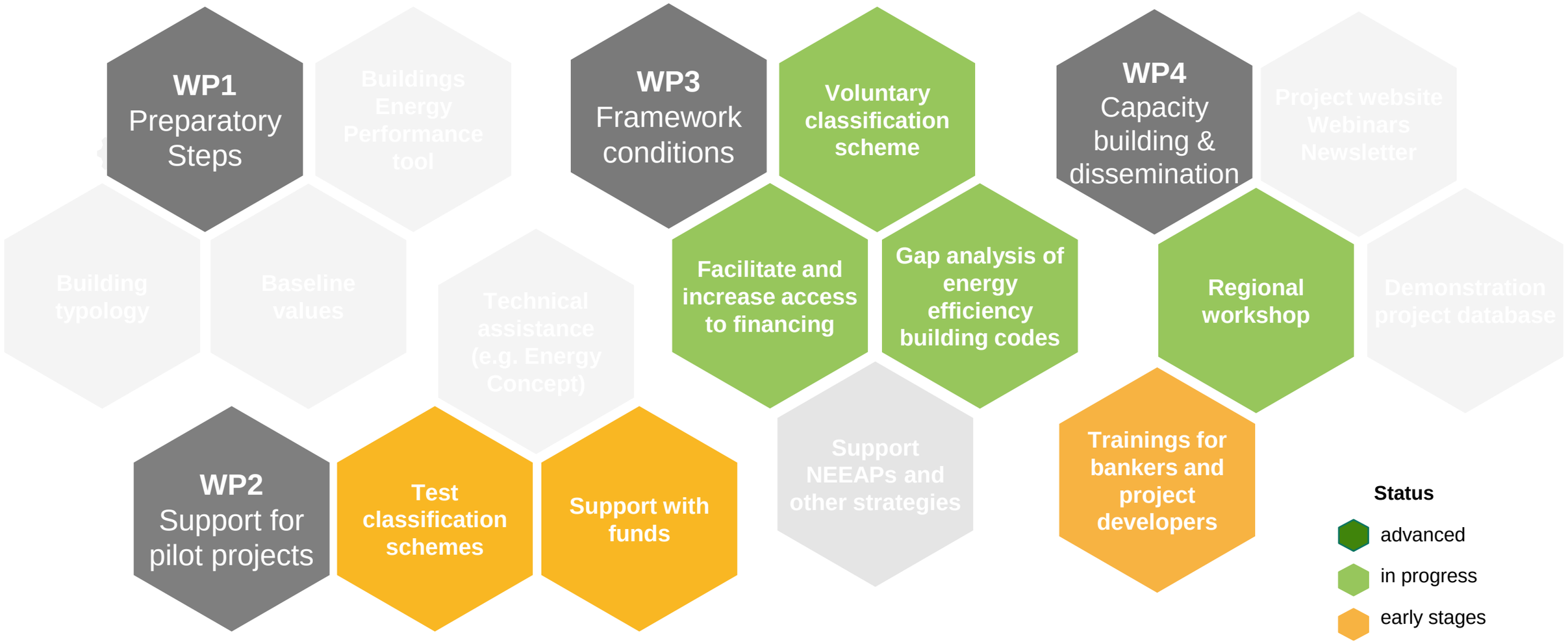
Wrap up

- Baseline and Building typology
- Voluntary classification scheme
- Buildings Energy Performance tool
- Support NEEAPs and other strategies
- Demonstration project database



Outlook

Where we're headed



Guidehouse BUILD_ME LCEC LEBANESE CENTER FOR ENERGY CONSERVATION المركز اللبناني لحفظ الطاقة

Connect with us:

Visit us on the web at **www.buildings-mena.com**

Download our **publications** and explore our **resources**

Sign up for our **newsletter** by emailing us at **BUILD_ME@guidehouse.com**

Guidehouse

Icons by Smashicons, Freepix

Contact

Carsten Petersdorff
carsten.petersdorff@guidehouse.com

Riadh Bhar
riadh.bhar@guidehouse.com

Marco Reiser
marco.reiser@guidehouse.com

Eslam Mahdy
eslam.mahdy@guidehouse.com

Kristen Brand
kristen.brand@guidehouse.com

Patil Mesrobian
patil.mesrobian@lcec.org.lb

Mohammad Hammad
mohammad.hammad@lcec.org.lb

Dr. Sorina Mortada
Sorina.mortada@lcec.org.lb

THANK YOU

FOR YOUR PARTICIPATION

This project is part of the International Climate Initiative (IKI). The Federal Ministry for the Environment, Nature Conservation and Nuclear Safety (BMU) supports this initiative on the basis of a decision adopted by the German Bundestag.

Guidehouse

BUILD_ME

LCEC
LEBANESE CENTER FOR ENERGY CONSERVATION
المركز اللبناني لحفظ الطاقة

INTERNATIONAL CLIMATE INITIATIVE (IKI)

Supported by:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

based on a decision of the German Bundestag