Guidehouse

BUILD_ME

الجَمعيّة العِلميّة المَلكيّة
Royal Scientific Society

National Workshop: JORDAN

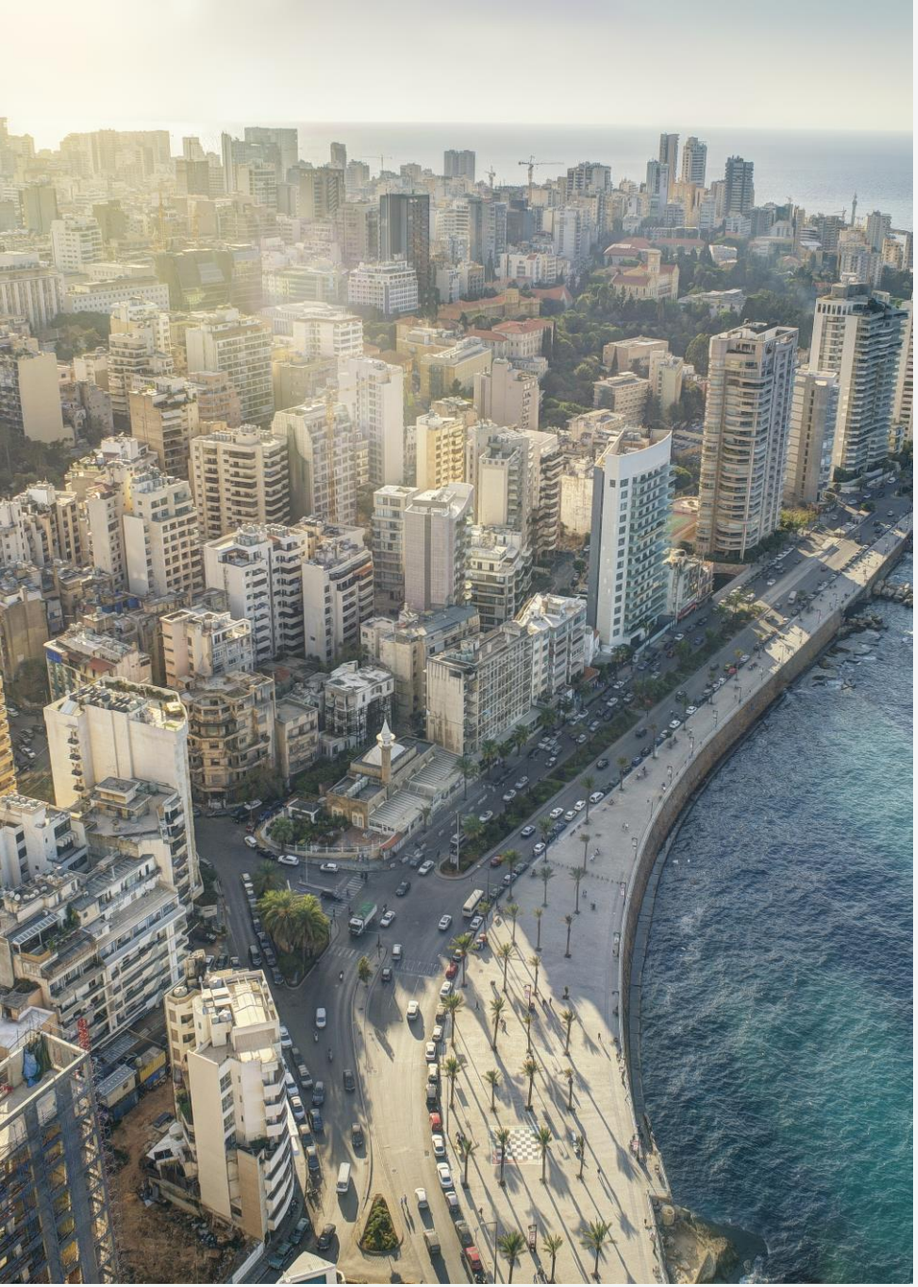
Climate-friendly buildings in the MENA region

4 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**
02	**BUILD_ME Update: Where do we stand after 2020?**
03	**BUILD_ME tools and the building sector in Jordan**
04	**Q&A**
05	**Break**
06	**Status of the new EEBC in Jordan**
07	**Technical assistance for pilot projects Case study: KONN**
08	**Diving into the demonstration project database**
09	**Q&A**
10	**Wrap up**

Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

Welcome words

Dr. Walid Shahin, RSS/NERC
Carsten Petersdorff, Guidehouse

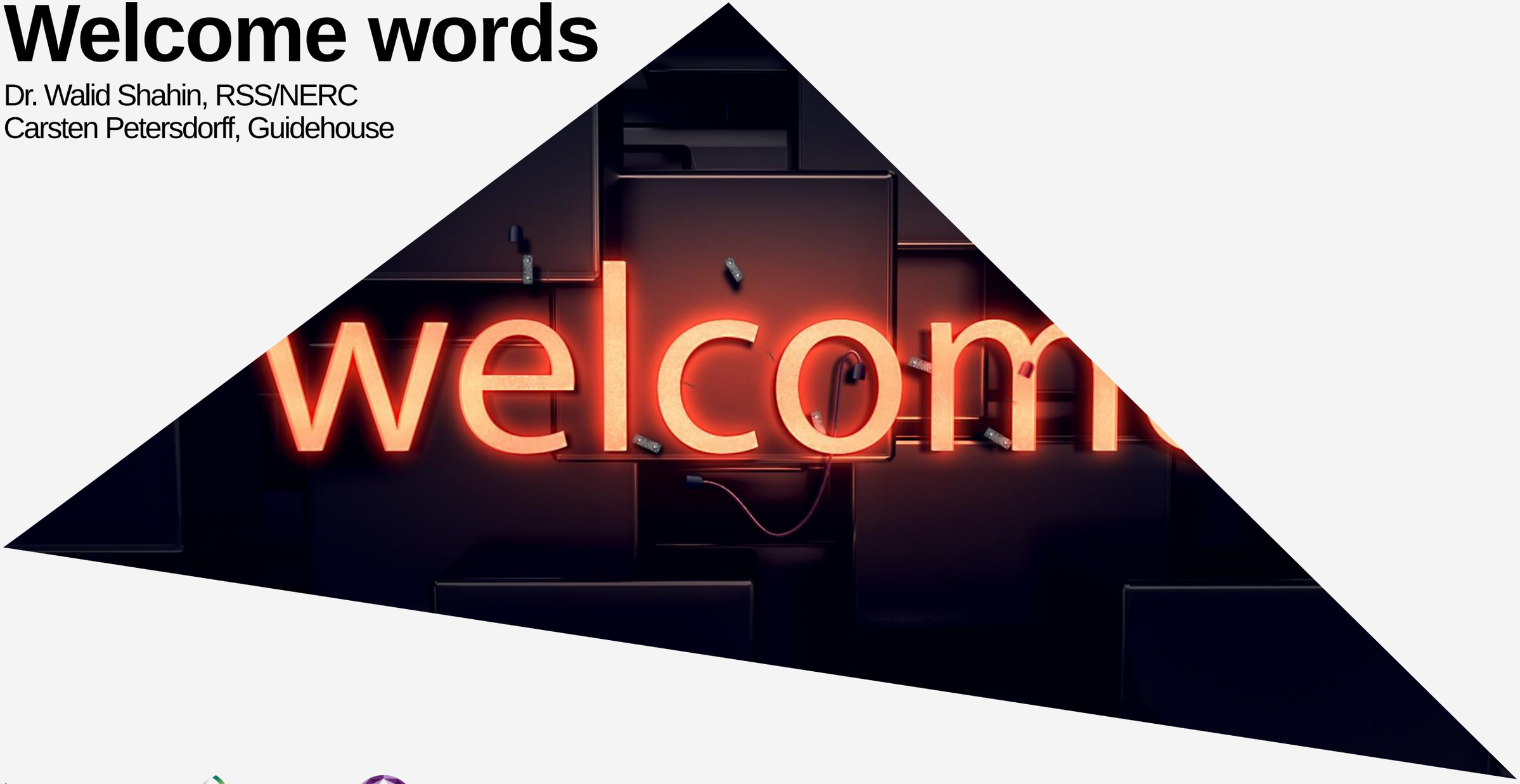


Bild von PIRO4D auf Pixabay

Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

BUILD_ME Update: Where do we stand after 2020?

Riadh Bhar, Guidehouse

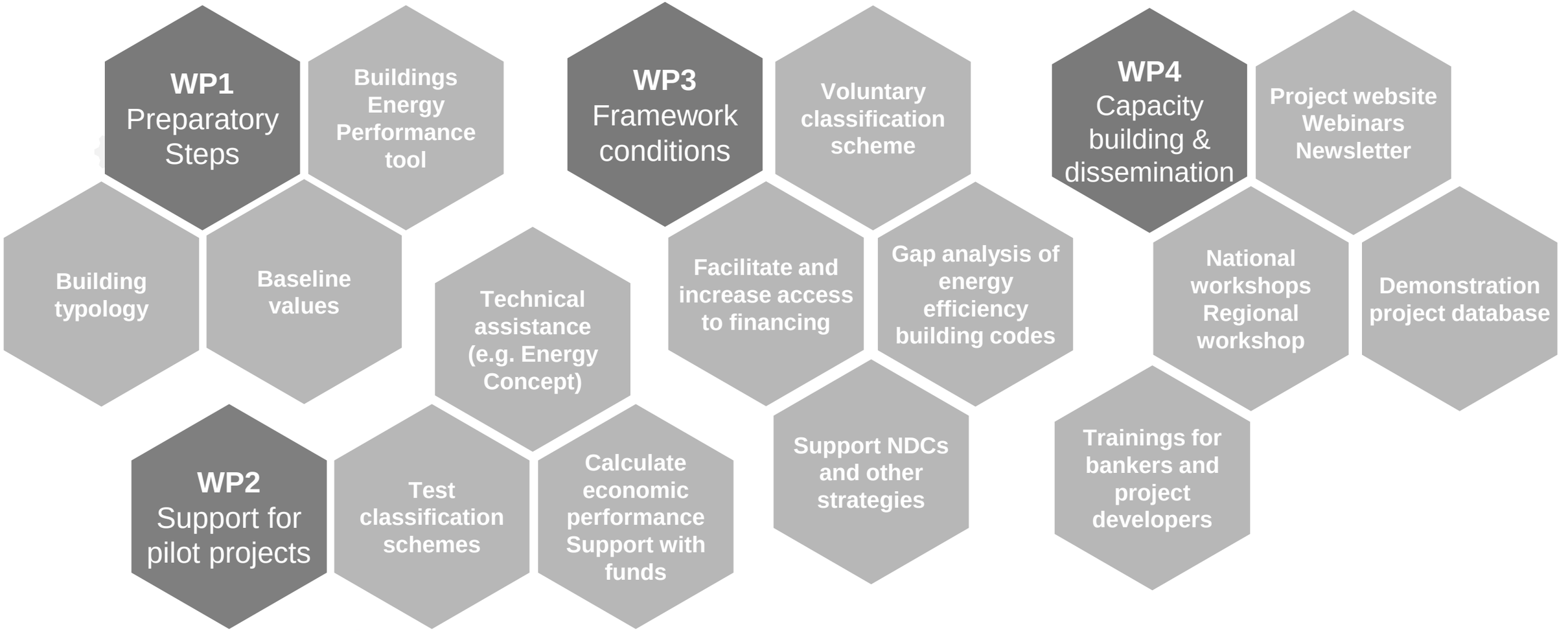
Guidehouse

BUILD_ME

الجَمعيّة العِلميّة المَلكيّة
Royal Scientific Society

BUILD_ME Update

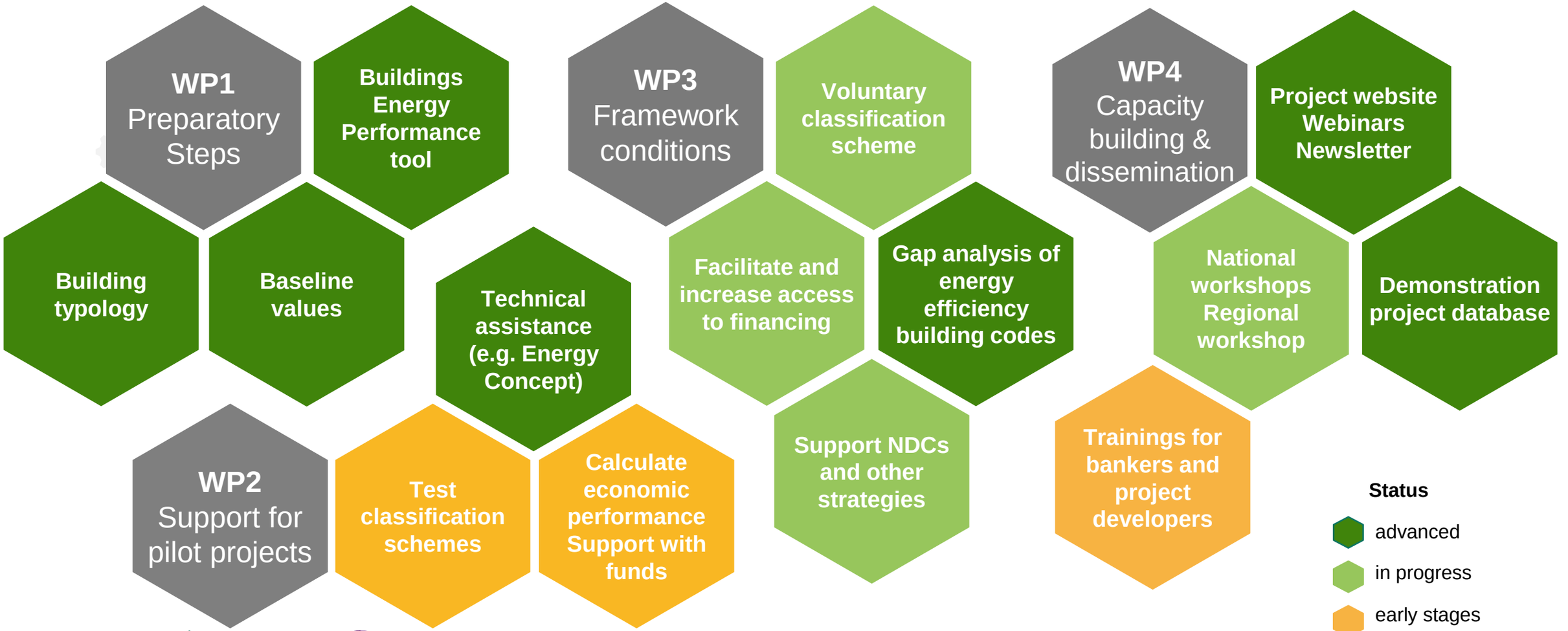
What are we working on?



Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

BUILD_ME Update

Where do we stand after 2020?



Guidehouse

BUILD_ME

الجَمعيّة العِلميّة المَلكيّة
Royal Scientific Society

BUILD_ME tools and the building sector in Jordan

Guidehouse

BUILD_ME

الجَمعيّة العِلميّة المَلكيّة
Royal Scientific Society

Building Energy Performance (BEP) tool

Marco Reiser, Guidehouse

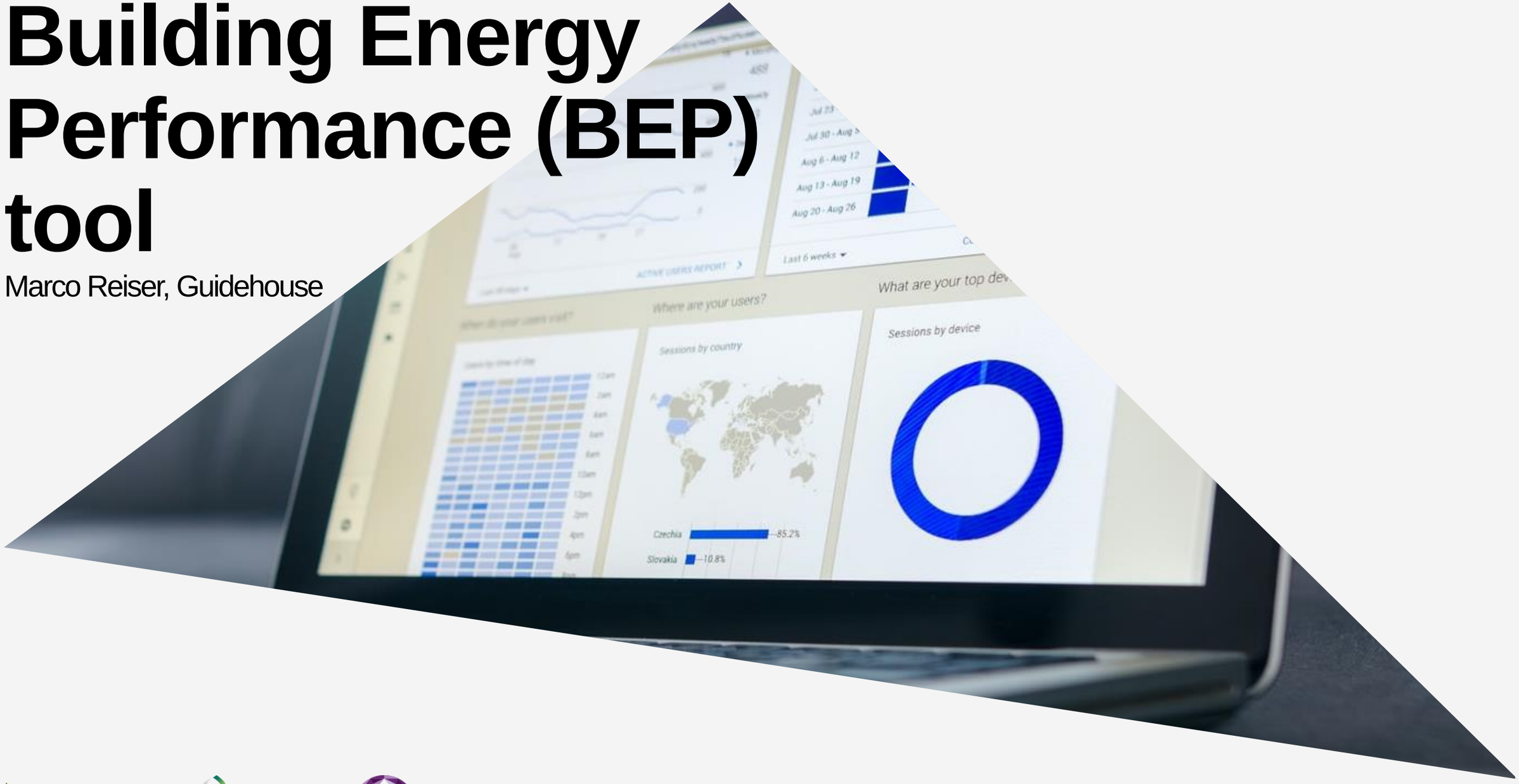


Photo by Lukas Blazek on Unsplash

Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

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

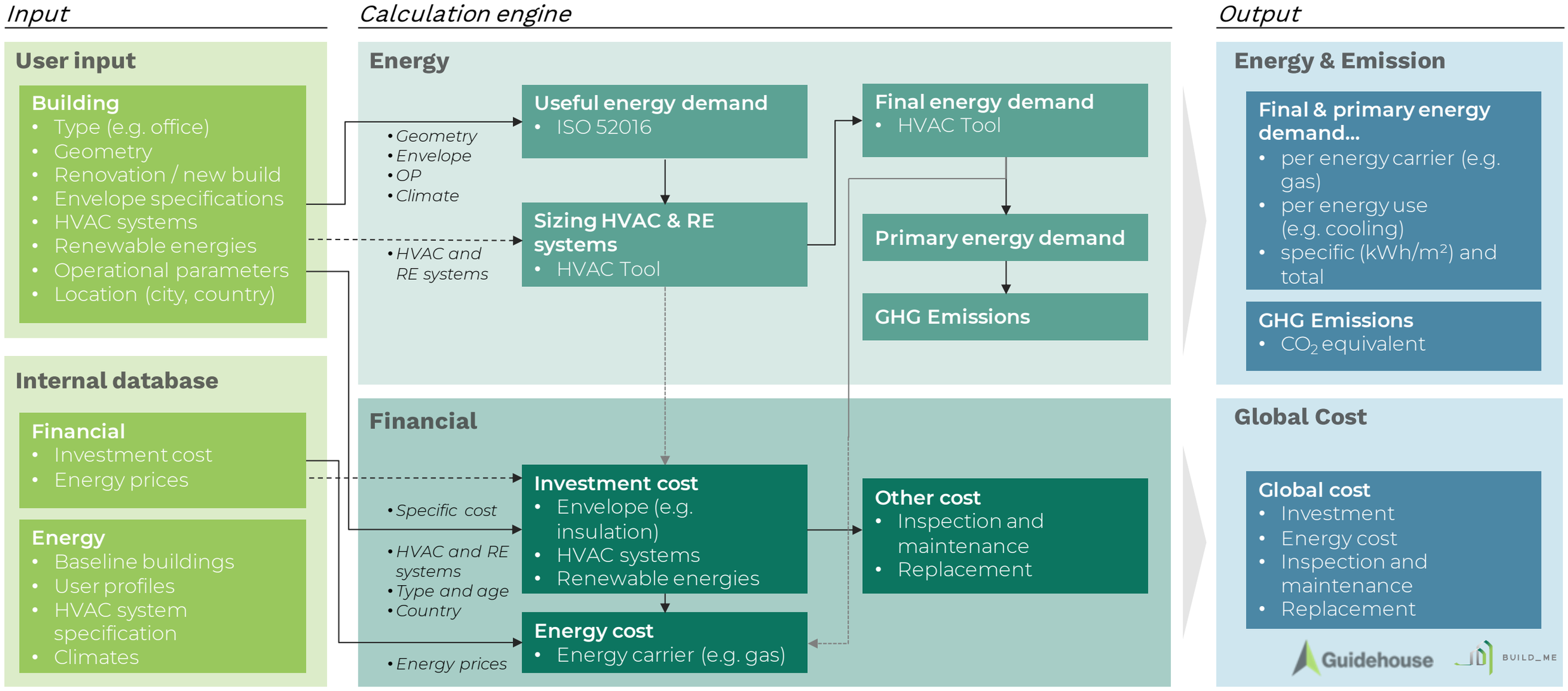
Proven methodology

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

Icons by Eucalyp from www.flaticon.com

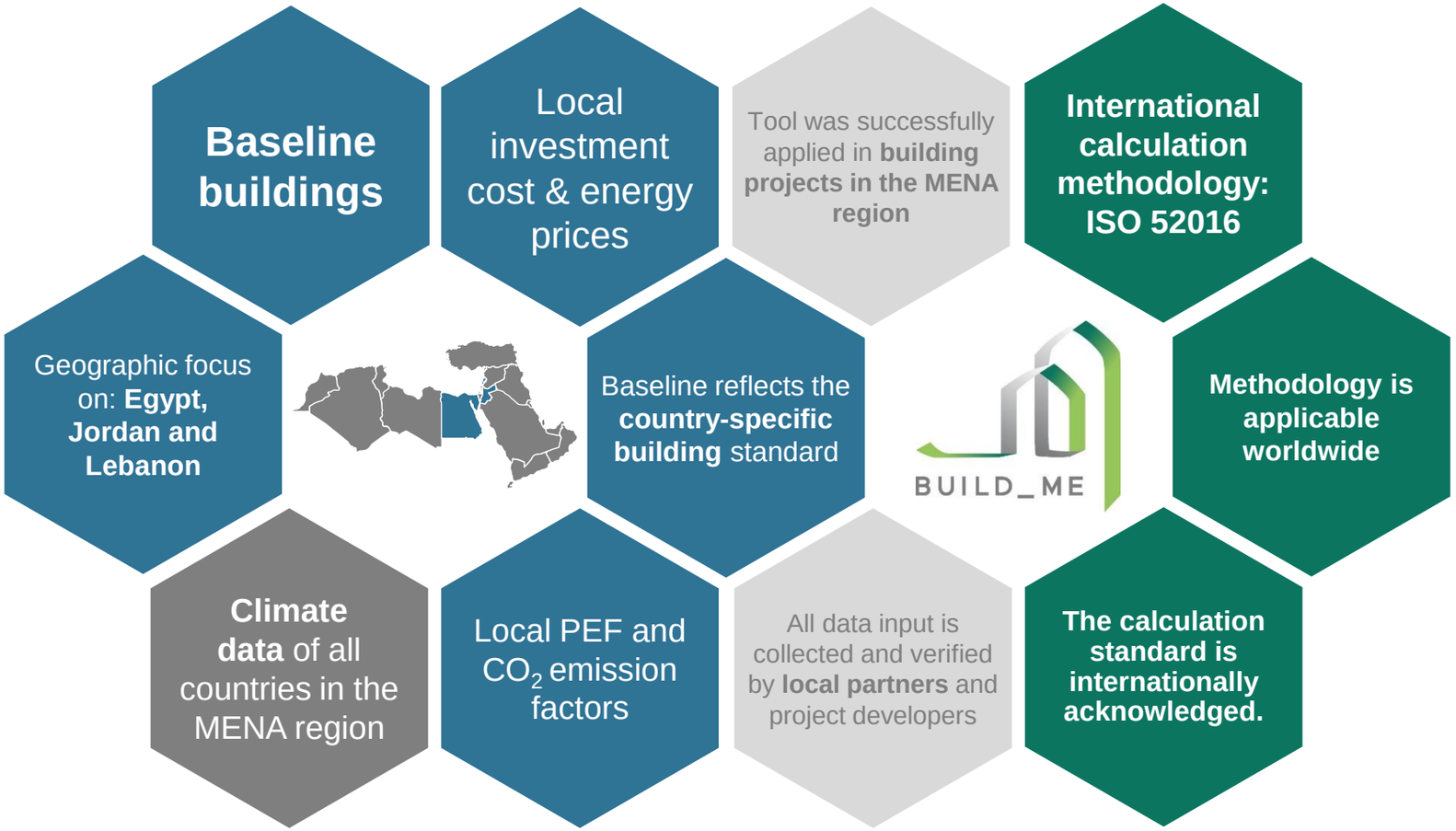
Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

BEP calculation methodology



BEP - Developed for the MENA region

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



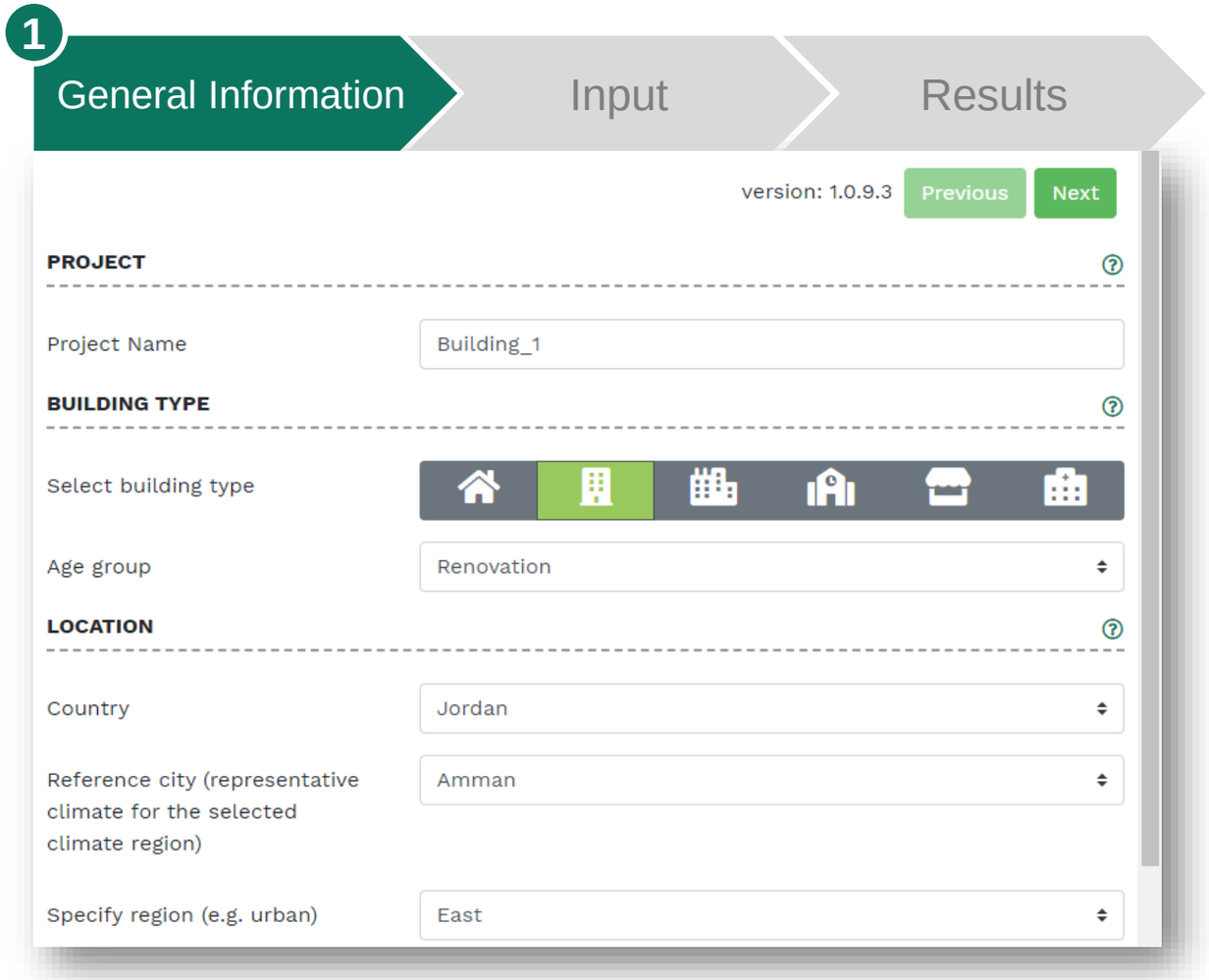
Internal market data **collected from local partners** for Egypt, Jordan and Lebanon

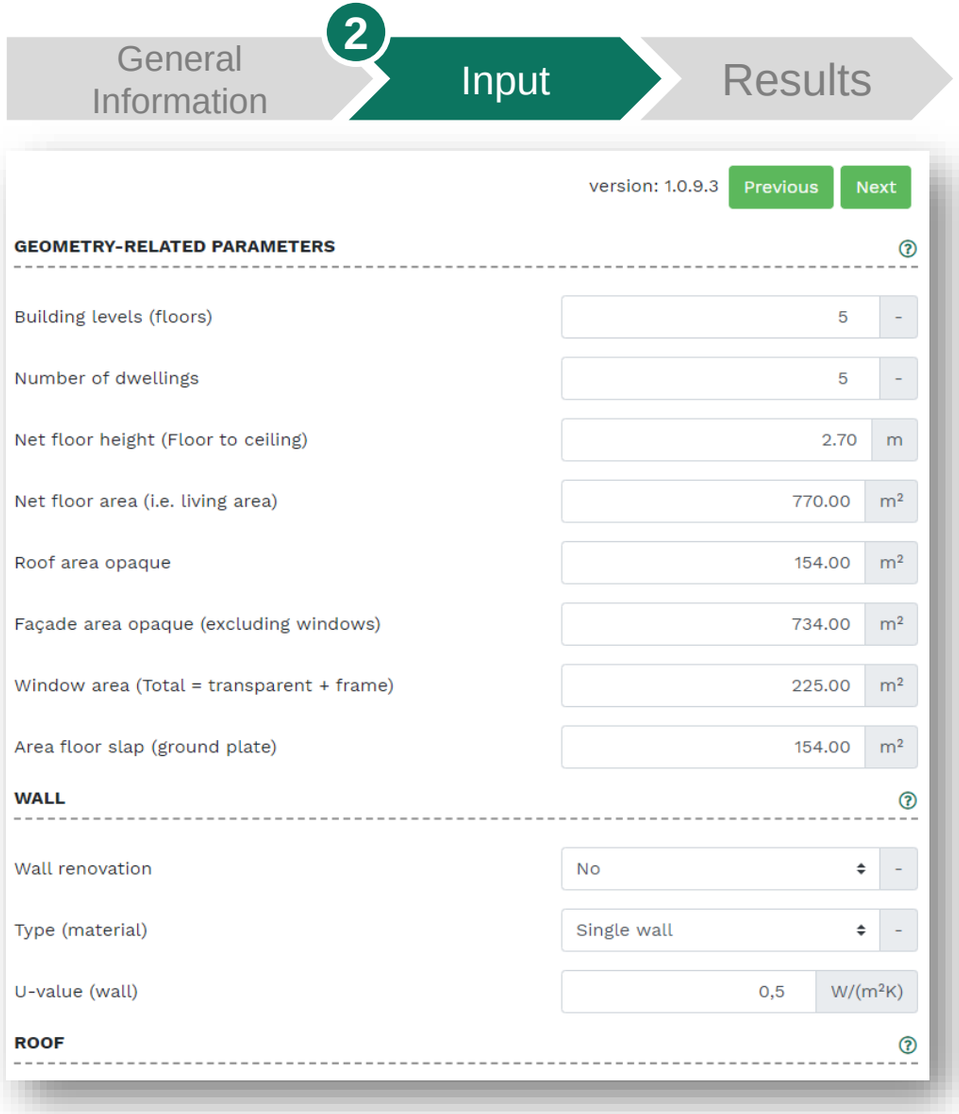
International energy calculation methodology

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

Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

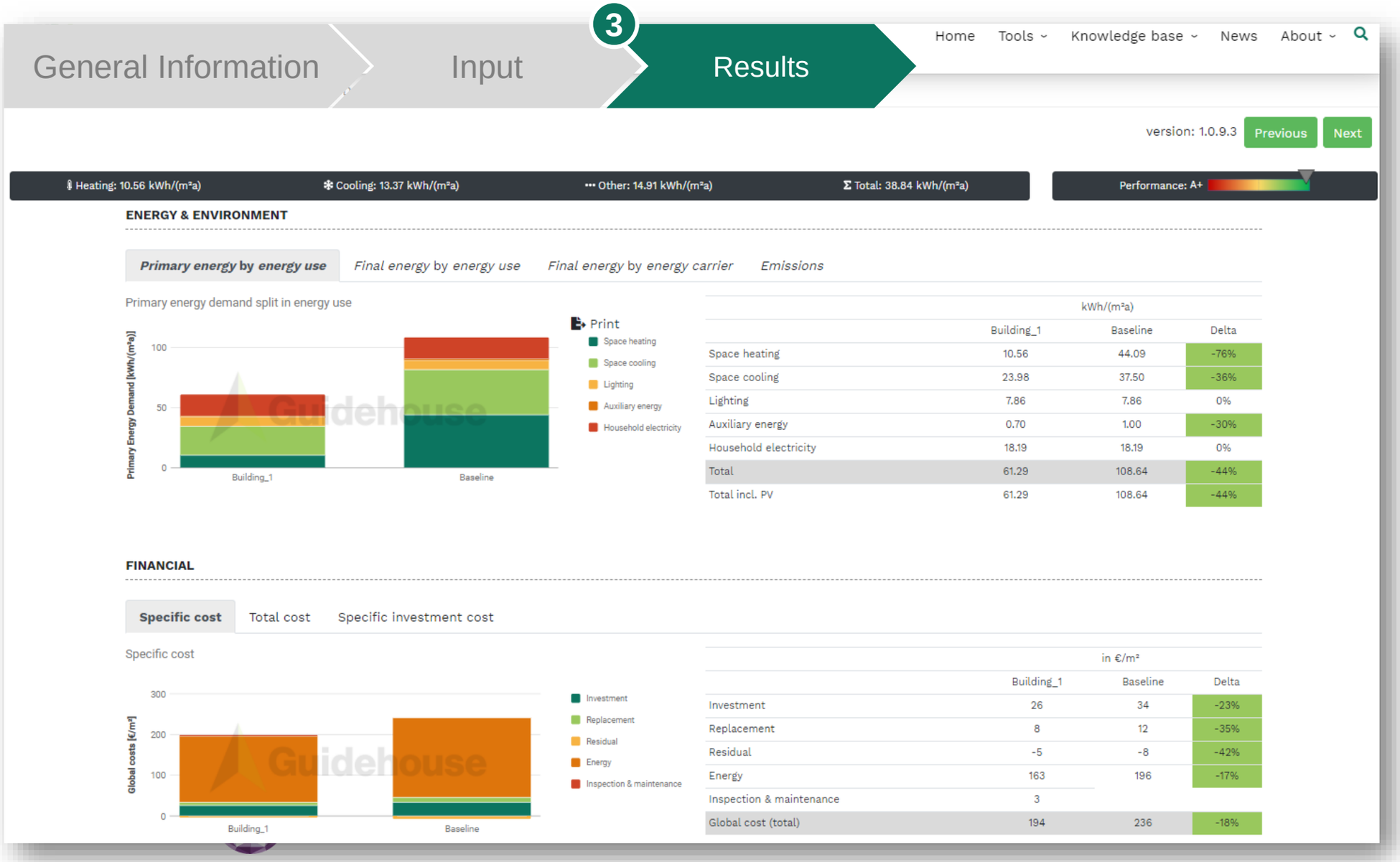
Online Tool - Input





Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

Online Tool – Results



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

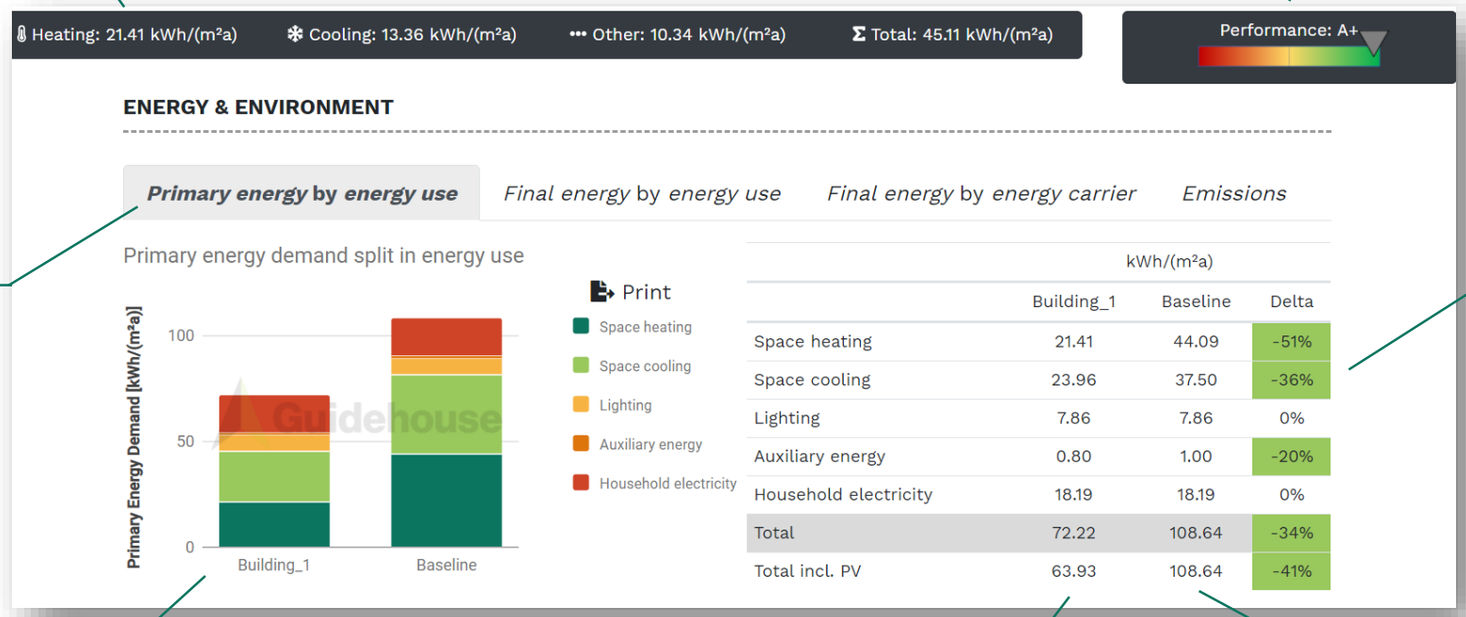
Detailed results of the baseline building

6| Comparison

Difference to the baseline buildings

7| Performance rating

C = equal to baseline



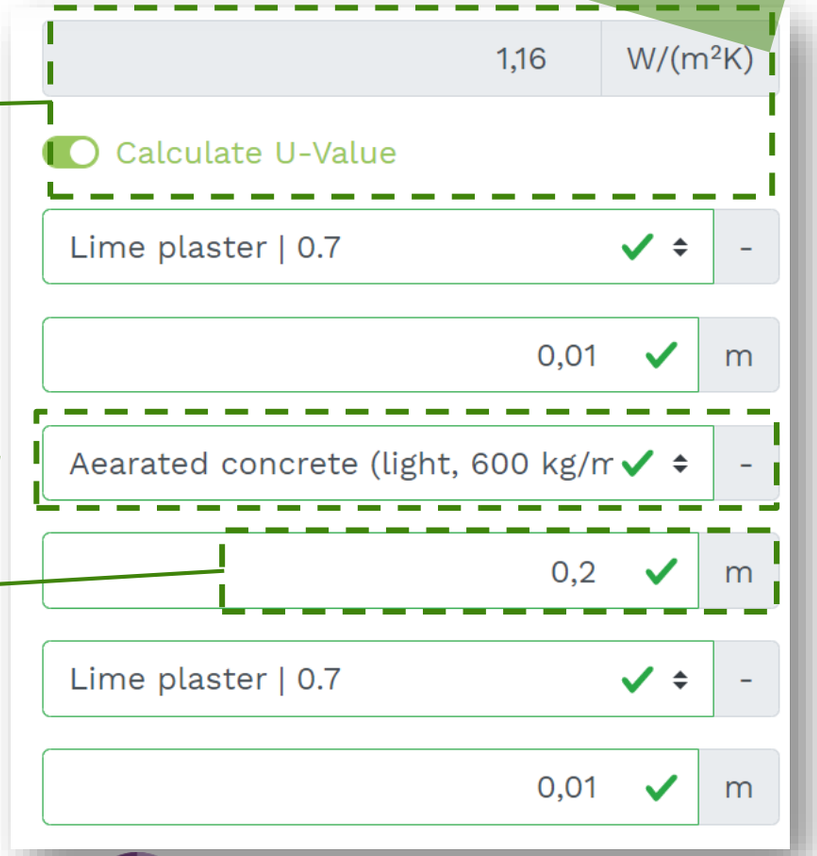
Online Tool – two new features

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 الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

Building typology

Ali AlMarzouq, RSS/NERC

Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

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

Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

Results and main sections of the template

A : General information

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

B: Geometries

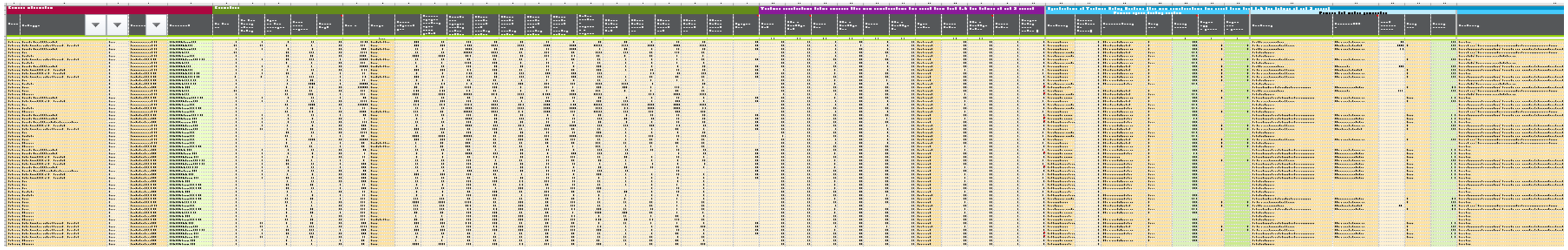
Number of stories	Number of dwellings	Typical number of occupants / users	Net floor area	Clear room height	Volume	Roof type	Area floor slab (ground plate)	Roof area opaque	Façade area opaque	Share of facade oriented north	Share of facade oriented east	Share of facade oriented south	Share of facade oriented 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

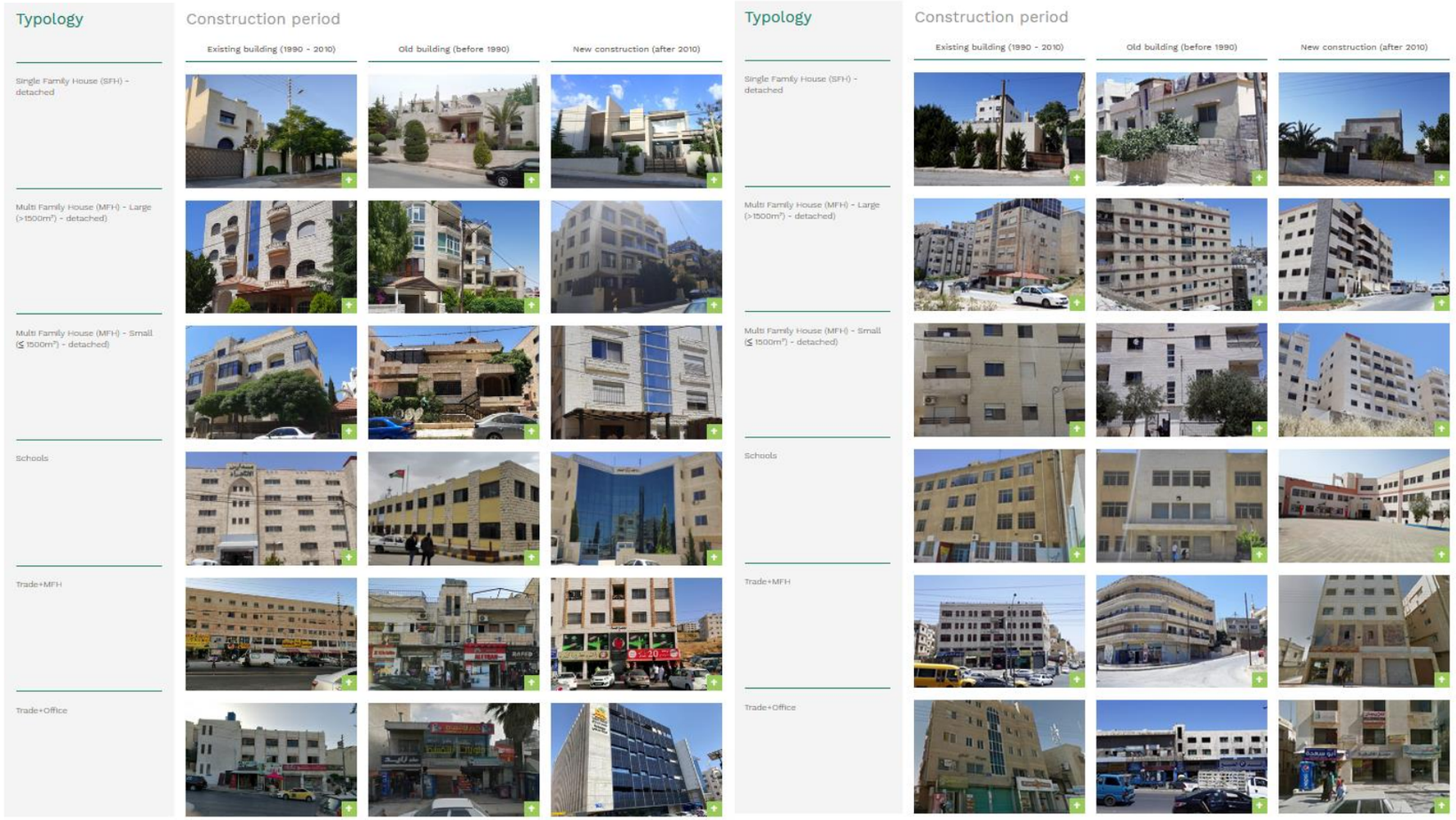
Primary space heating system	Secondary space heating system	Primary hot water generator	Secondary hot water generator	Primary space cooling system	Secondary space cooling system	Ventilation	Photovoltaics	Lighting	Temperature set-points



Building typology
Results

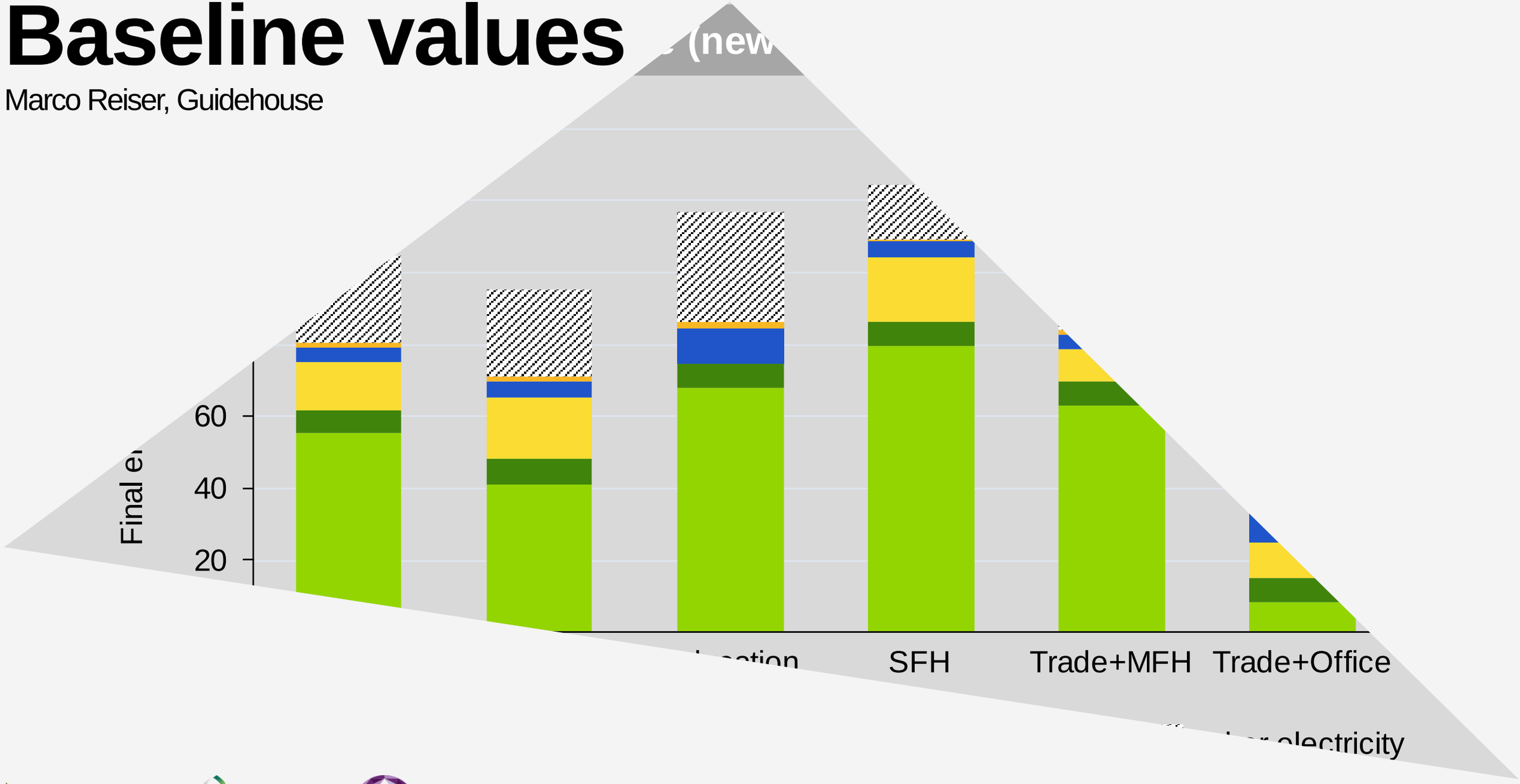
Visit: https://www.buildings-mena.com/typologies

- **Main buildings types**
  - SFH
  - MFH (small <1500 m2)
  - MFH (large > 1500 m2)
  - Schools
  - Trade
  - Office
- **Construction period**
  - Before 1990
  - 1990 – 2010
  - After 2010
- **Region**
  - Amman East
  - Amman West



Baseline values

Marco Reiser, Guidehouse



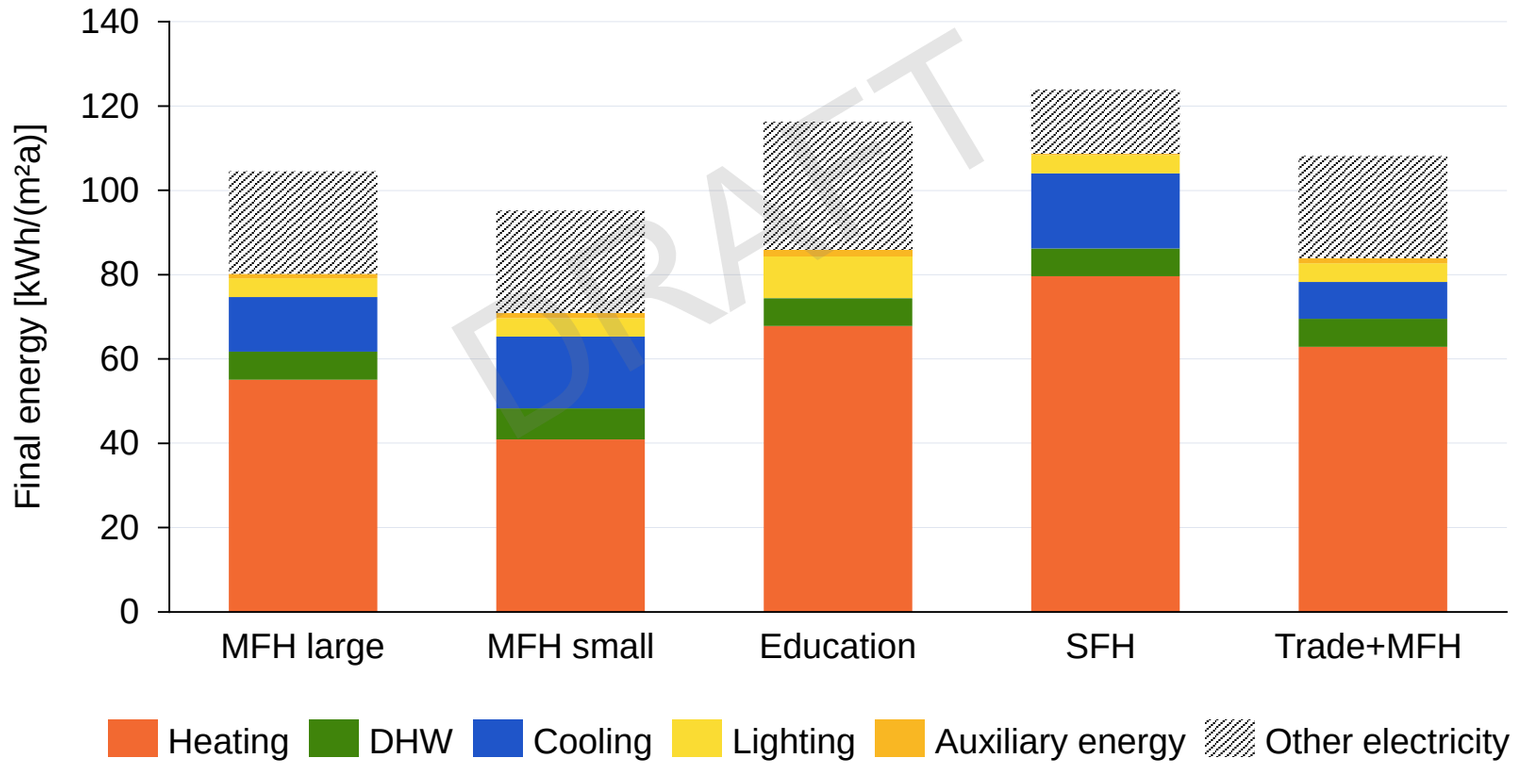
Baseline

Illustrating energy intensity of selected Jordan building types

Key takeaways

- Specific final energy demand ranges between **95 – 120 kWh/(m²a)** for buildings constructed over the past decade
- **Space heating** accounts for largest energy demand
- **Space cooling** is about 1/3 of the space heating demand
- Note: Other electricity stands for plug-loads (e.g. fridge, TV, etc.) and is informational

National baseline (new buildings, after 2010)



Baseline

Illustrating energy intensity: Multi-family house (large)

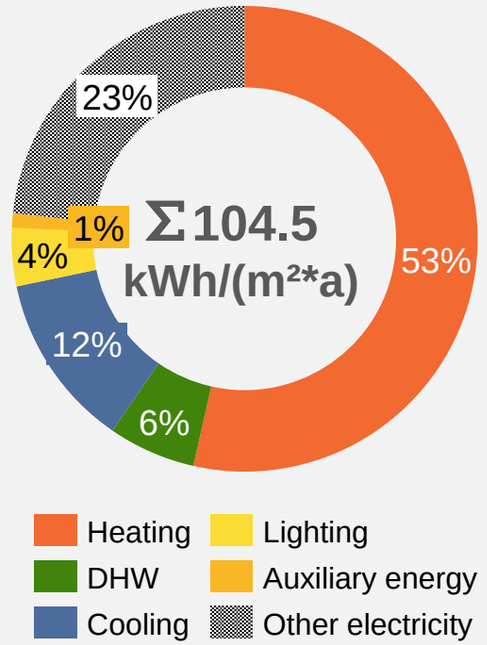
Building standard

- New buildings (constructed after 2010)
- Thermal insulation is used in external walls and roofs
- Following the EEBC 2018

Energy demand

- 105 kWh/m²/a (80 kWh/m²a for HVAC and Lighting)
- Energy consumption for heating approx. half of total

Parameters	Baseline
Roof insulation (U-Value)	0.55 W/m²K
Wall insulation (U-Value)	0.57 W/m²K
Floor insulation (U-Value)	1.2 W/m²K
Windows (U-Value; G-Value)	5.7 W/m²K; 0.85
Window fraction	Ø 11%
Shading	Manual shading
Air tightness	0.25 1/h
Heat supply	LPG heater (80%)
Cold supply	Single split (EER: 3.0 – 3.9)
Hot water	Direct electric
Ventilation systems	Free ventilation
Lighting systems	LED
Renewable energy	No
Set temperature cooling/heating	24°C / 21°C



Energy cost
15.7 EUR / (m²*a)

CO2 - emission
2.3 kg / (m²*a)

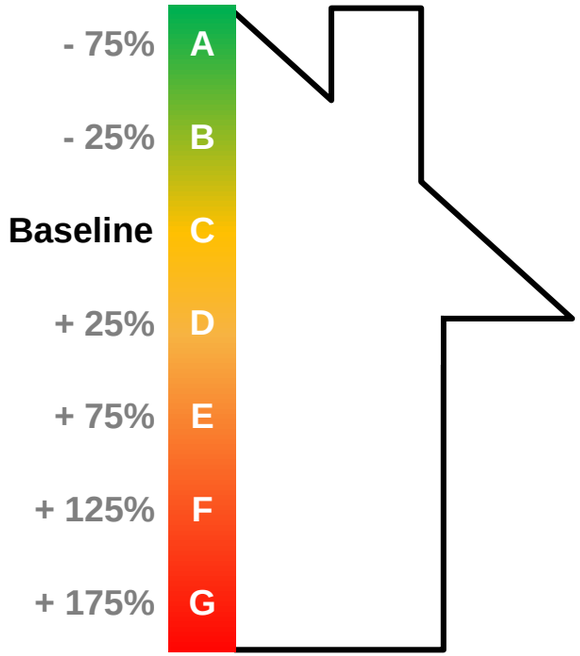
Baseline

Next steps, development of classification scheme

Rating 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 rating score to baseline level



Methodology behind the BUILD_ME rating

- Rating 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)

Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

Status of the new Energy Efficiency Building Code [EEBC] in Jordan

Eslam Mahdy, Guidehouse
Naela Al-Daoud, RSS/CSBC

Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

Analysis of EEBC in Jordan

Introduction, approach and working steps

A. Status quo analysis

Code development process

Technical requirements

Implementation mechanisms

B. National expert interviews

Government experts

Academia

NGO and associations

C. Challenges and recommendations

General Challenges

General Recommendations

Priority Recommendations.

D. Analysis of best practices

Comparison with best practices

Regional practices, international practices.

E. Specific recommendations

Exchange with relevant stakeholders.

Recommendations for implementation and/or enforcement

Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

Challenges of implementation and enforcement of EEBCs

Interim results of steps A, B and C

The technical challenges

- The well elaborated complex code lacks a simplified checklists of MEPs.
- The lack of a clear third-party inspection procedures.

The institutional and regulatory challenges

- There is a need to develop a detailed checklist and/or conformity certificates to comply with the code.
- To translate the codes requirements into procedures and steps using simplified/market language for construction technicians.

The financial challenges

- The perception that construction according to EEBCs results in high additional cost. However, it has been proven that the additional cost can be 10% at maximum with an ROI within 10 years.
- There are no direct incentives designated to compliance according to EEBCs.

Capacity building and awareness challenges

- There is a good level of awareness and high level of interest about EEBCs among the relevant stakeholders, but it is more focused on RE rather than EE of the whole building.

Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

General recommendations for improvement of EEBCs

Interim results of steps A, B and C

An enforcement schemes	Adopting an enforcement scheme and activating a clear third-party inspection with dedicated staff and responsibilities including a detailed checklist of MEPs
A national coordination mechanism	Adopting national coordination mechanism between different stakeholders by defining the authority responsible matrix, with relevant approvals and actions
EEBC compliance manual	To develop an EEBC compliance manual with clear technical requirements, procedures and assigned responsibilities
Manual for the energy calculation methods	Prepare special manual for illustrating the methods for the calculation of energy performance, energy demand, and energy audit in industrial and commercial sectors
Establish funds for EEBCs	Establish funds to provide direct and/or indirect incentives for compliance with the EEBC

Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

الجَمعيّـة العِلميّـة المَلكيّـة
Royal Scientific Society

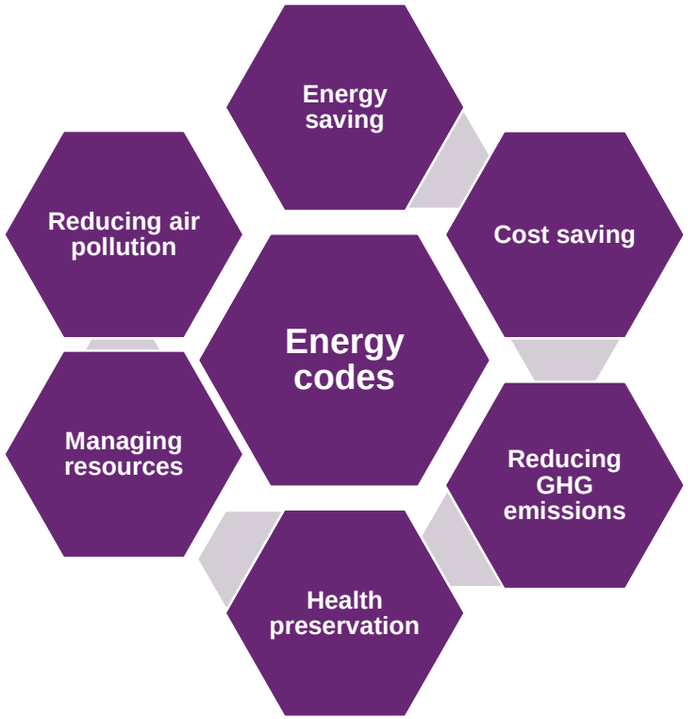
National Energy Building Codes and Manuals

Status and ambition

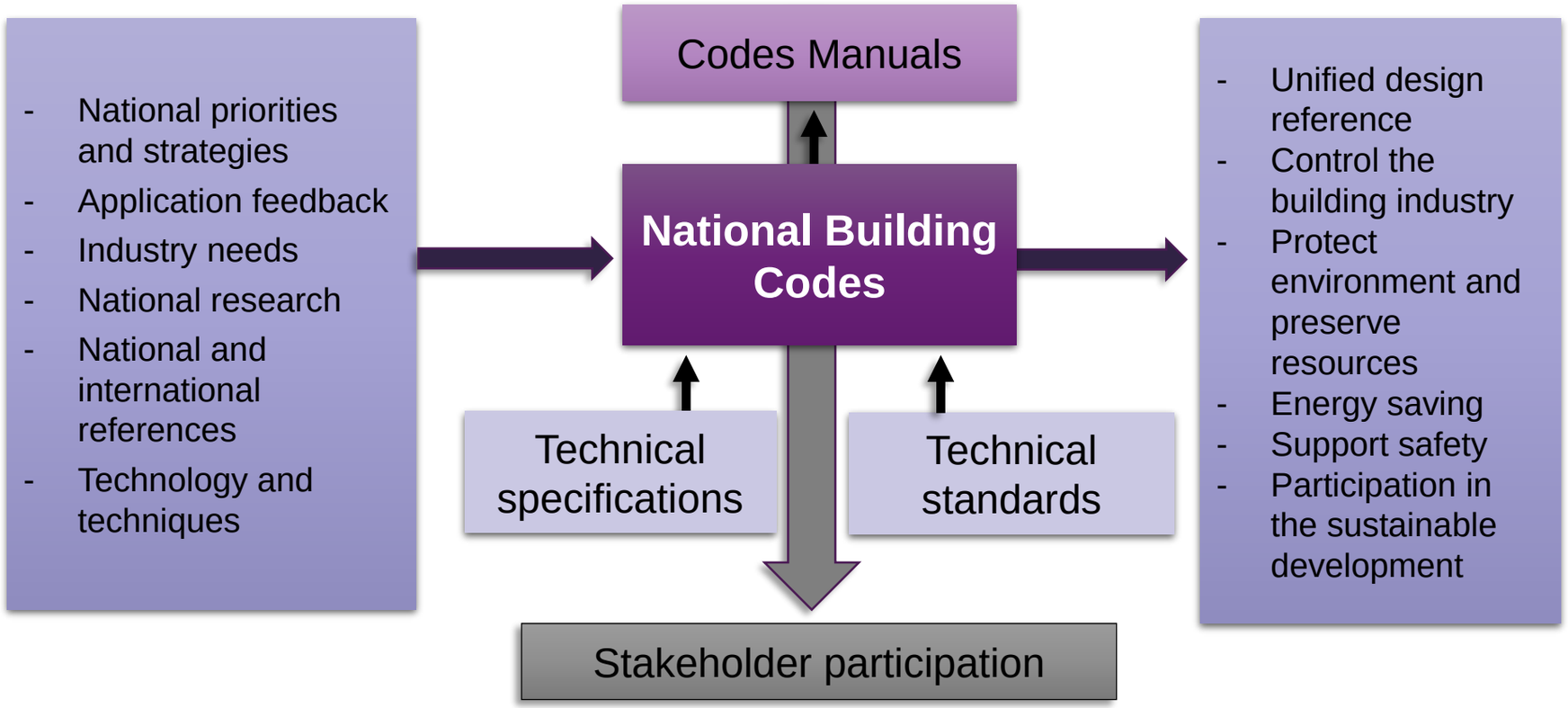
4.03.2021

WHY ENERGY CODES?

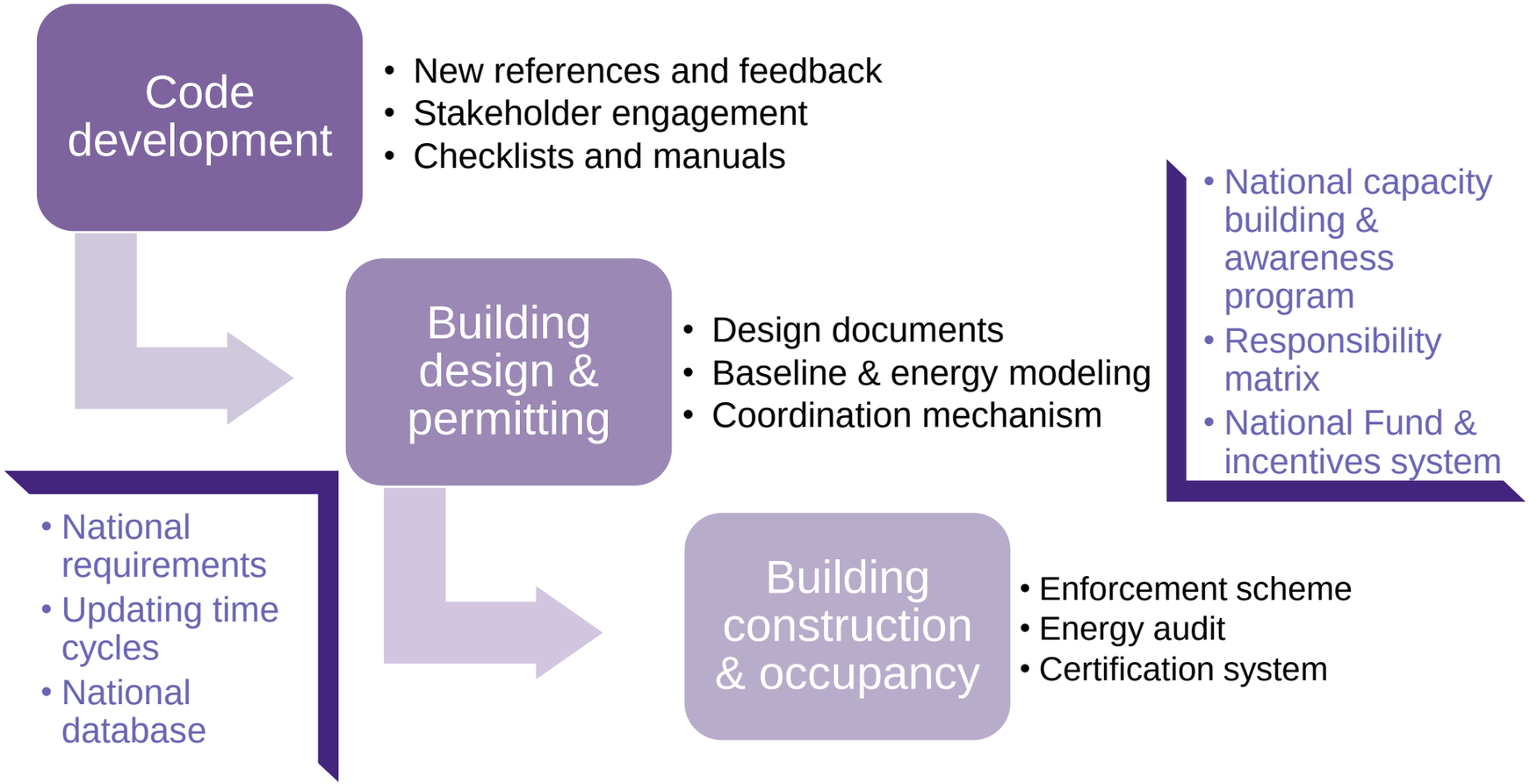
Energy codes set the minimum design requirements for new and renovated buildings, assuring energy, economic and environmental benefits.



ENERGY CODES DEVELOPMENT… CURRENT



ENERGY CODES ADOPTION… AMBITION



Energy Codes and Manuals
Until March 2021

The following Codes and Manuals have been prepared to cover the technical requirements for energy in the construction sector in Jordan:

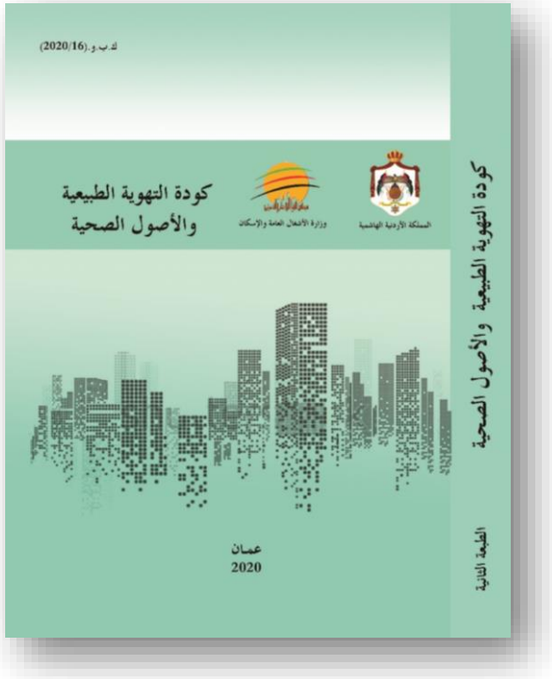
- Thermal Insulation Code and Manual
- Jordan Green Building Guide
- Natural Lighting Code
- Natural Ventilation Code
- Interior Illumination Code
- Energy Efficient Buildings Code and Manual
- Solar Energy Code and Manual
- Central Heating Code and Manual
- Mechanical Ventilation and Air Conditioning Code and Manual
- Code for Gas Piping in Buildings

Natural Ventilation Code

Second Edition, 2021

The code objective is to provide buildings with air flow, without air currents, with capability of control, by utilizing outside wind, temperature differences between inside and outside the building, external openings design, and the building spaces.

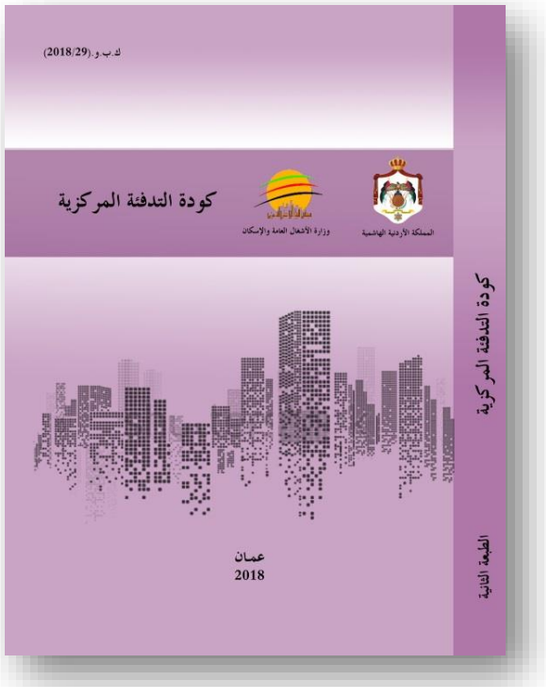
New buildings, extensions on existing buildings, and adjustments to existing buildings (without energy consumption increase), are required to apply the requirements.



Central Heating Code
Second Edition, 2018

This code aims to provide the minimum requirements for comfort, public health and safety, and to achieve ways to reduce energy consumption and its means, by organizing design, construction, installation, quality of materials, location, operation, maintenance and control in central heating systems in hot water.

The code includes everything related to the design, implementation and operation of central heating systems that use hot water, and the use of devices and equipment such as section radiators and underfloor heating systems.



Energy Efficient Buildings Code and Manual

Being updated

The code aims to provide minimum requirements for energy efficiency in buildings excluding the low-rise residential buildings (two floors or less), in the design, construction, operation and maintenance phase of the building.

The draft contains seven sections dealing with the most important information the engineer needs to carry out the design, implementation and operation of buildings in accordance with the requirements of the minimum energy efficiency.

Some of the most important topics covered by the new draft are:

- HVAC equipment's minimum energy performance requirements.
- The minimum measures required for the building envelope to save energy, such as skin and roof minimum thermal insulation requirements, glazing, infiltration, and whole building simulation.

Energy Efficient Buildings Code, and Manual

The First Draft Content

- Chapter One: General, Objective, Scope, Definitions.
- Chapter Two: Building Envelope
- Chapter Three: Mechanical ventilation, Heating and Air Conditioning Systems
- Chapter Four: Water Heating Systems
- Chapter Five: Electrical Power
- Chapter Six: Artificial Lighting
- Chapter Seven: Evaluating the energy efficiency of buildings

Solar Energy Code, and Manual

Being updated

The purpose of this code is to indicate the minimum requirements that must met in solar energy systems, whether they are solar photovoltaic systems or solar thermal systems, in order to ensure the protection of public health and safety and the public good.

The requirements and conditions in this draft are applied to the construction, installation, modification, restoration, relocation, replacement, addition, use, and maintenance of solar thermal systems and solar PV systems.

The draft includes topics such as:

- Utilization of solar thermal systems in swimming pools and hot tubs as well as thermal storage system.
- Lightning protection, and earthing design and installation.
- System monitoring.

Solar Energy Code, and Manual

The First Draft Content

Part One: Photovoltaic Systems

- **Solar PV components**
- **Solar PV arrays and panel operational features**
- **System performance**
- **system electrical design**
- **Protection against lightning and overvoltage**
- **Inverter**
- **System requirements and connection to the electrical network**
- **Structural and mechanical requirements**
- **Monitoring system**
- **Installation process**

Part Two: Energy Systems

- **General Requirements: Equipment specifications, Circulating Pumps, Valves, Safety requirements, Disposal of liquid waste**
- **Piping Systems: Installation, Testing, Inspection, Dual Purpose Water Heating Systems, Expansion Tanks, Joints and Connections, System Control**
- **Solar Collectors**
- **Solar thermal systems**
- **Storage Systems**

الجَمعيّـة العِلميّـة المَلكيّـة
Royal Scientific Society

Thank you

For further information please contact

Eng. Naela Al-Daoud

naela.daoud@rss.jo

PO Box 1438, Amman 11941, Jordan
T (+962) 6 534 4701 | F (+962) 6 534 4806 | www.rss.jo

Selection process for pilot projects

Total numbers of all countries

Project Developer Information	
Developer Name	Palm Hills Developments http://www.palmhilldevelopments.com/
Projects	24 including 12 delivered projects
Hindquarters Address	Palm Hills Building, Smart Village, Cairo-Alexandria Desert Road
Contact Person	Ahmed Alaila
Contact information	Senior Vice President
Pilot Project Alternatives	
Alternative 1	
Project Name	BADYA
Project Type	Residential (Villas & Multifamily house), office parks, commercial, retail, hotels, educational, health care, & mixed-use
Location	Sixth of Octobar City
Ownership	Private with revenue sharing with Ministry of Housing
Project Status	Detailed conceptual & illustrative master plan for the entire project, detailed design for Phase 1; construction initiated on site September 2019
Total Project Area	12.6 Million M2
No. of buildings and floors	Various: G+1 to G+10 in addition to several high-rise buildings under study
Conditioned floor area	7.2 Million M2 with up to 10 Million M2 allowed of residential floor area and up to 1.5 Million M2 of commercial, retail, educational, hospitality & other specialty services
Areas of units (residential)	Phase 1: 720,000 M2 of residential floor area in Phase 1A
Finishing level	Will this project be sold as fully or semi-finished? Partially fully finished and partially core & shell
Operation	Will the developer be responsible for operating the project? Developer responsible for operation including maintenance, metering, billing and full services management

General information	Number of pilot project
	Description of building
	Location
	Status of construction phase
Prerequisites - GCF Safeguards (Social, Environmental)	PS 2 – Labor and Working Conditions
	PS 3 – Resource Efficiency and Pollution Prevention
	PS 4 – Community Health, Safety, and Security
	PS 5 – Land Acquisition and Involuntary Resettlement
	PS 6 – Biodiversity Conservation and Sustainable Management
	PS 7 – Indigenous Peoples
	PS 8 – Cultural Heritage
Prerequisites - Eligibility for financial funds	Nature of company
	ESCo
	ESHS
	Financially viable and bankable
	No combination of grants
Scoring	1 Influence / consideration of EE/RE infrastructure
	2 Developer will build and operate the project
	3 Chance of implementation (till Dec 2021)
	4 Diversity of projects
	5 Replicability
	6 Importance, size and scalability
	7 Track record of project developer
	8 Ease of cooperation with project developer
	9 Architectural esthetics

NAVIGANT
A Guidehouse Company

or other negligent act in performing the consulting services or resulting from the consulting services.

This MoU does not implicate any direct or indirect financial support or request.

Signed for and on behalf of Navigant Energy Germany GmbH, A Guidehouse company

Signed on behalf of ALDAU EVELOPMENT"

Carsten Petersdorff, Director

Cologne, 21.02.2020

Dr. Tarek Elgamrawy, General Manager

Egypt, Date: 1st

Outreach
to developers and architects

WS
invitation to limited number

Key data
of interested developers

Evaluation
of the relevant projects

Selection
of the top ranked projects

MoUs

150+

50+

45+

35+

17

15

Supporting and Learning from Pilot Projects

Overview of Selected Pilot Projects in Jordan

KONN Modular Houses

- KONN concept represents a number of prototypes of residential single-family houses
- The prototypes are envisioned to provide affordable modular housing by using smart modular construction.

Private Residence

- A private single-family house designed by Salfiti architecture.
- It is an example of single-family houses in the Greater Amman Municipality.

Dar Al-Oqoud

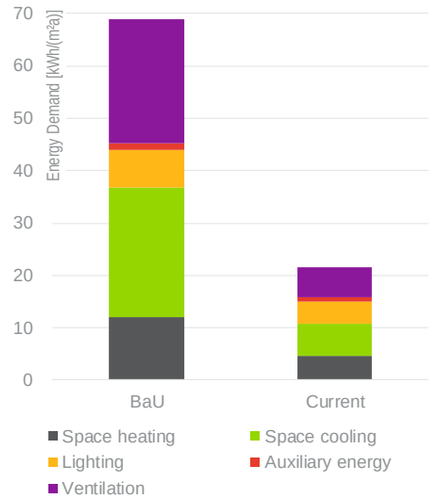
- Dar Al-Oqoud is designed and constructed by MAS Design Studio as a passive energy house.
- It is constructed using traditional building techniques such as loadbearing stone walls with vaults and domes.

Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

Approach and methodology

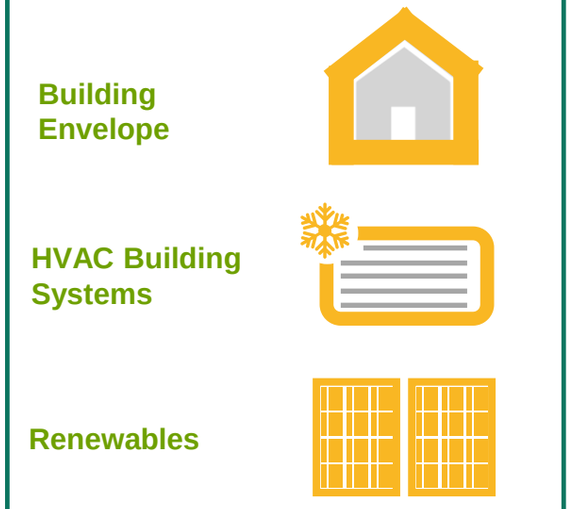
Steps towards a low energy building

1 Comparison with baseline



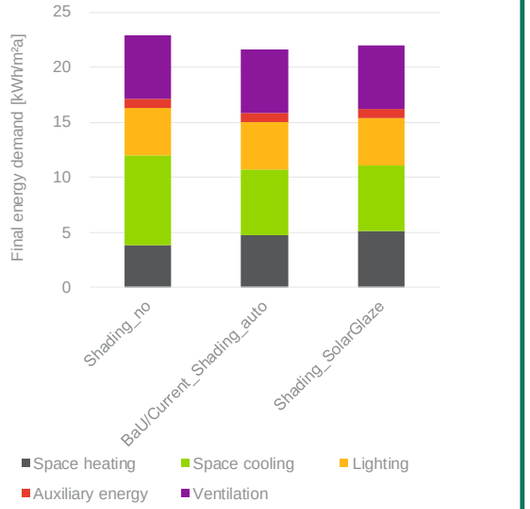
- Estimate the baseline consumption
- Estimate the consumption of current design
- Comparison

2 Energy efficiency recommendations



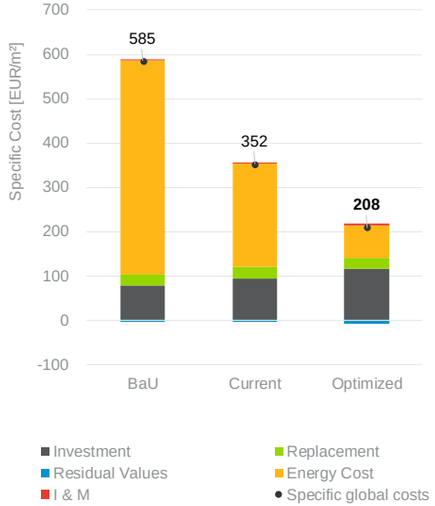
- Building envelope
- HVAC I efficiencies
- Renewables
- Other measures

3 Development



- Optimized as result
- Discussion with developers
- Local and market inputs
- Costs and ROI

4 Final recommendations



- Final loop discussing feasibility of measures
- Adapt selected measures and finalize calculation including payback, investment and lifetime

Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

Case study: Konn Homes

Husni Abzakh, Konn Technologies

Photo by Konn Technologies

Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

KONN
HOMES

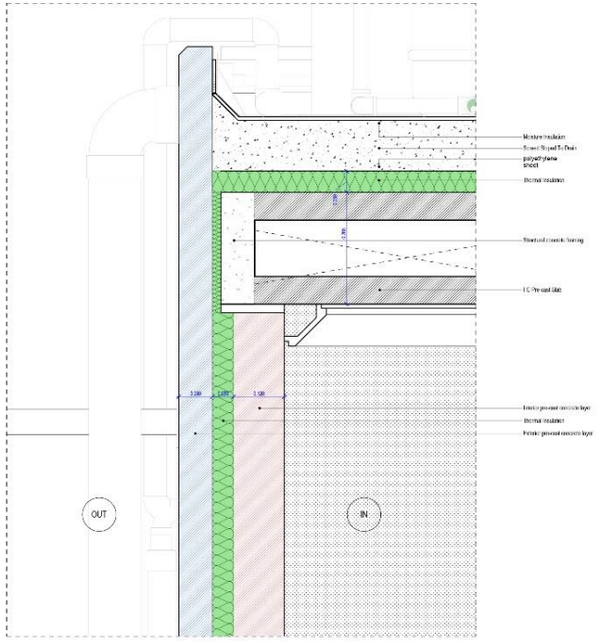
Konn Homes is a construction technology company that provides advanced, tech-enabled solutions for the construction of sustainable and affordable homes.

Konn's vision is to lead the way into the future of living with the safest and most sustainable homes, and it is on a mission to make high quality living affordable to all segments of society through technology.

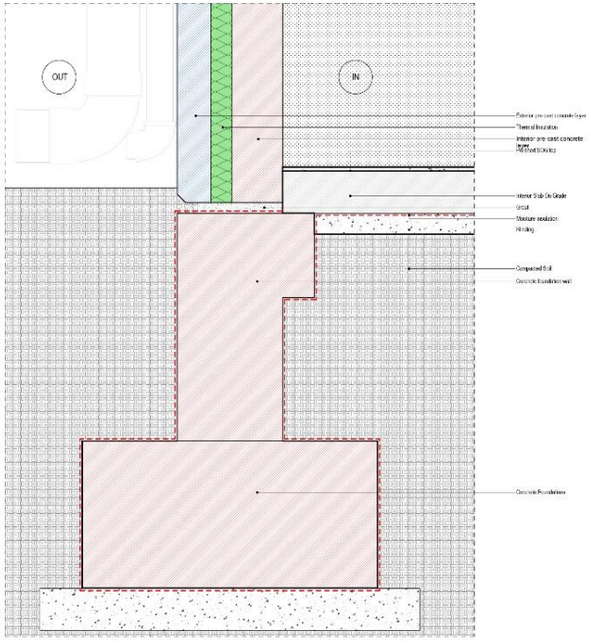
Konn homes are designed for the lifestyle and needs of the residents of Jordan and the MENA region, and built with the highest performing materials and techniques for the local climate and environment.

Building Envelope

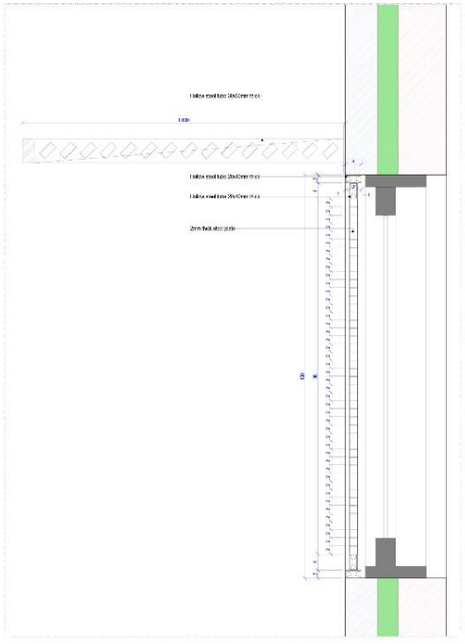
Building Element	Description	U-Value (Baseline)	U-Value (Iteration)
Exterior Walls	Precast concrete sandwich panels with XPS thermal insulation boards	0.57 W/m²K.	0.44 W/m²K.
Roof	Prestressed Hollow-core slab panels topped with XPS thermal insulation boards, 100mm sloped screed and Polyurethane damp proofing membrane	0.55 W/m²K.	0.41 W/m²K.
Windows	Double glazed windows with low-E glass panels	3.2 W/m²K.	1.5 W/m²K.
Foundations (SOG)	Cast in-situ reinforced concrete foundation walls, blinding and 100mm thick SOG	3.36 W/m²K.	3.36 W/m²K.



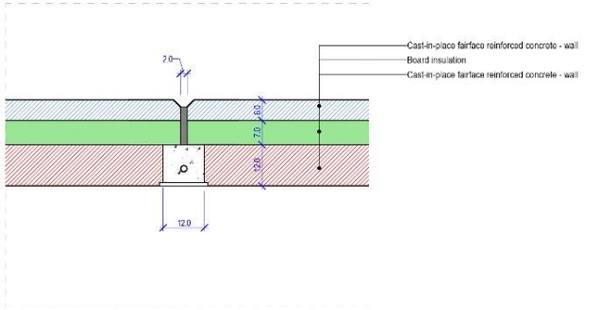
Wall/Roof Slab connection



Wall/Foundation Connection



Window Section



Wall/Wall Connection

Building Systems

HVAC Systems & Appliances

Heating / Cooling

1/1.5 TonSplit unit A/C unit for each room, cooling/ heating (4 COP)
Coefficient of Performance = 3.52 W/W

Lighting

LED (natural light) integrated energy-saving lighting fixtures

Appliances

A++ Energy saving appliances for the living room and kitchen
(TV, Washing Machine, Refrigerator, Dishwasher, Microwave)

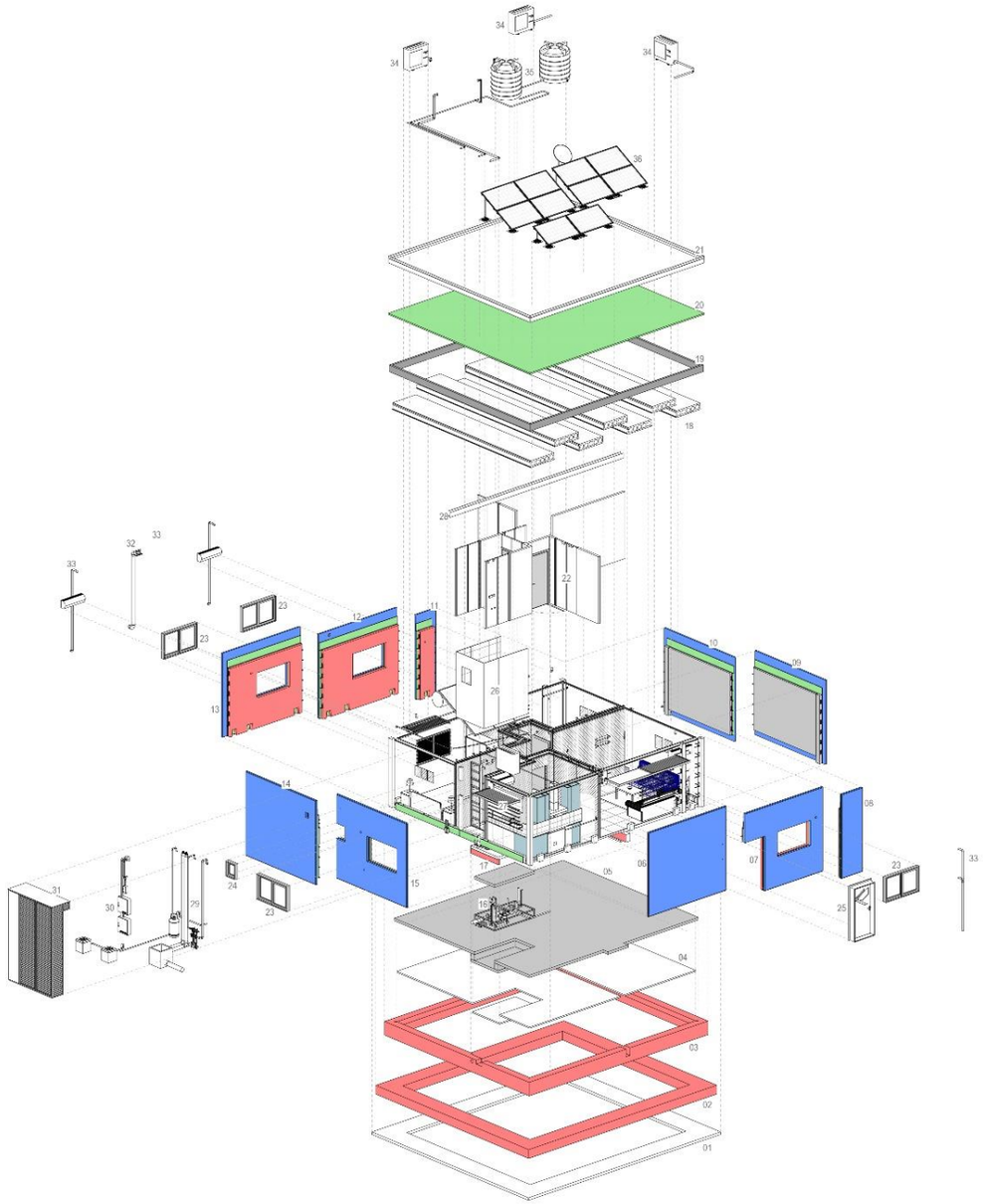
Renewable Energy

Solar Collector

Combined flat plate solar collector with hot water cylinder with integrated Instantaneous electrical water heater

Photovoltaic

Super high power poly perc Modules
Max. Power capacity = 2.0 KW



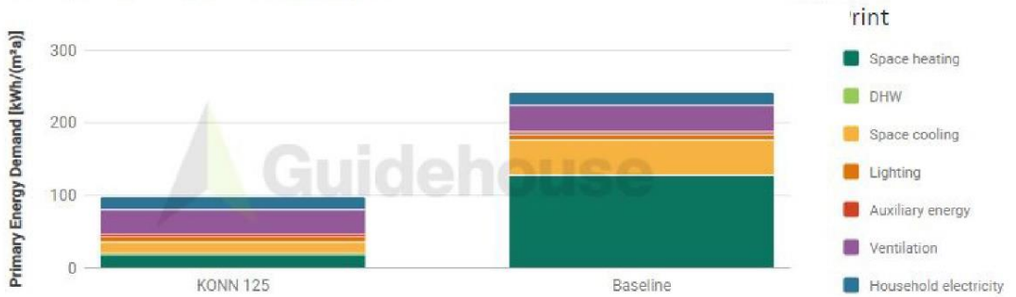
Building Energy Performance Tool by Guidehouse

Heating: 10.50 kWh/(m²a) | Cooling: 8.48 kWh/(m²a) | Other: -6.04 kWh/(m²a) | Σ Total: 12.94 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)		
	KONN 125	Baseline	Delta
Space heating	18.84	127.52	-85%
DHW	1.40	-	-
Space cooling	15.21	48.39	-69%
Lighting	7.86	7.86	0%
Auxiliary energy	3.26	3.99	-18%
Ventilation	33.73	36.23	-7%
Household electricity	18.19	18.19	0%
Total	98.49	242.18	-59%
Total incl. PV	23.22	242.18	-90%

FINANCIAL

Specific cost | Total cost | Specific investment cost

Specific cost

	in €/m²		
	KONN 125	Baseline	Delta
Investment	184	164	+13%
Replacement	65	47	+38%
Residual	-17	-17	-3%
Energy	30	207	-85%
Inspection & maintenance	16		
Global cost (total)	280	417	-33%

Short film from KONN‘s first project

Products and Outlook

Current Listed Products :

KONN - 70

Area : 70 sqm

Spaces: 2 Bedrooms, 1 Bathroom,
Living room, Kitchen

KONN - 90

Area : 90 sqm

Spaces: 2 Bedrooms, 2 Bathrooms,
Living room, Guest room, Kitchen

KONN - 125

Area : 125 sqm

Spaces: 3 Bedrooms, 3 Bathrooms,
Living room, Guest room, Kitchen

Pipeline Products and Developments :

1. Product Optimization :

- Building envelope and systems developments
- Materials and process optimization
- Introduction of CRM
- Production and Assembly optimization
- Supplied chain optimization
- Integration of IoT

2. In Production :

Projects:
- 5 Confirmed sales in 2021

Add-ons:
- Precast Stairs
- Precast Canopies

3. Products in Development :

Multi-storey Buildings:
- Konn 180
- Konn 250
- Konn 300

Single-storey Buildings:
- Konn BASIC

Contact

KONN HOMES

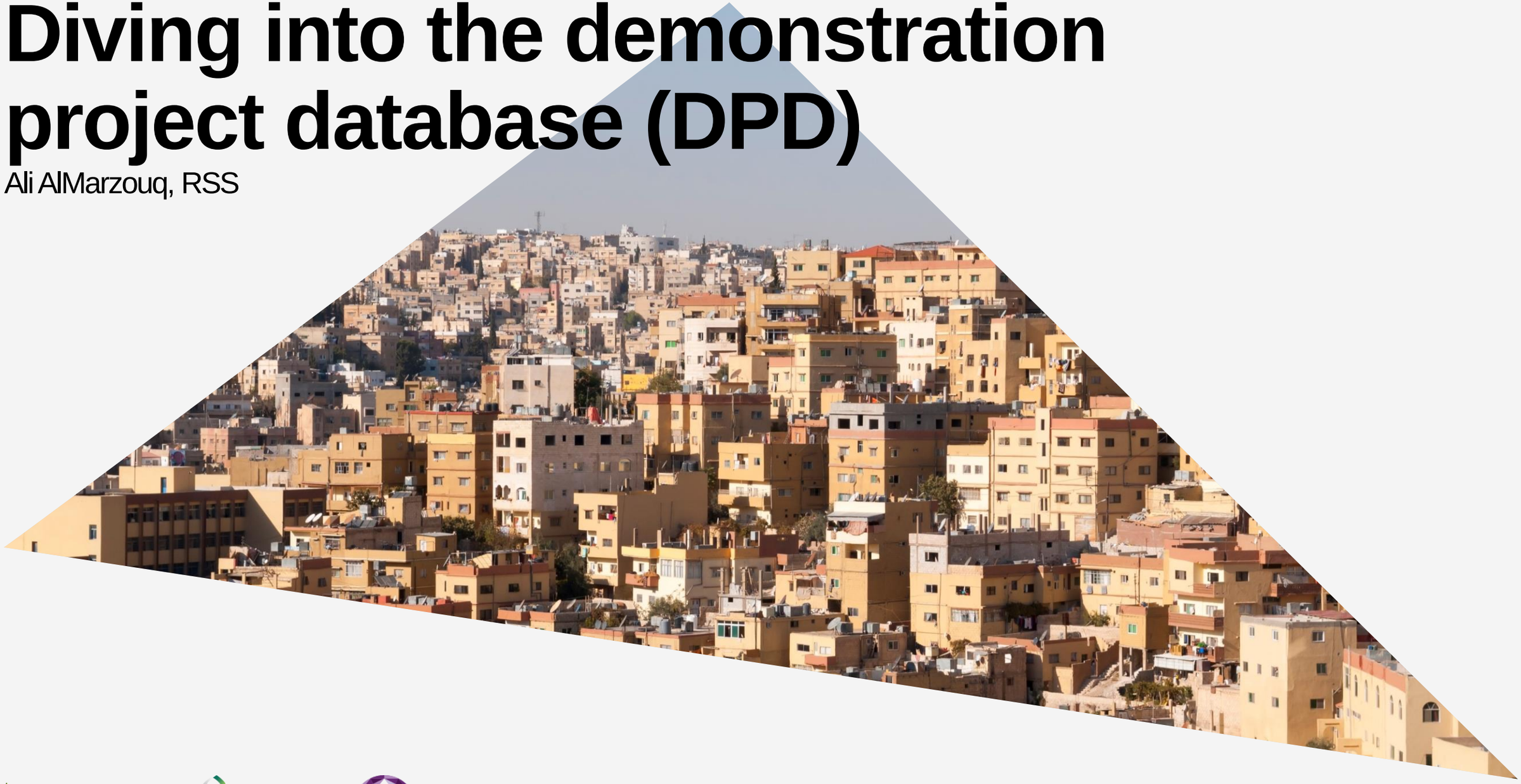
Website: www.konn.tech
Email: info@konn.tech

09 Mohammad Amin Al Momani St
Amman 11821, Jordan

Phone: +962 6 2220855

Diving into the demonstration project database (DPD)

Ali AlMarzouq, RSS



Guidehouse BUILD_ME الجَمعيّة العِلميّة المَلكيّة Royal Scientific Society

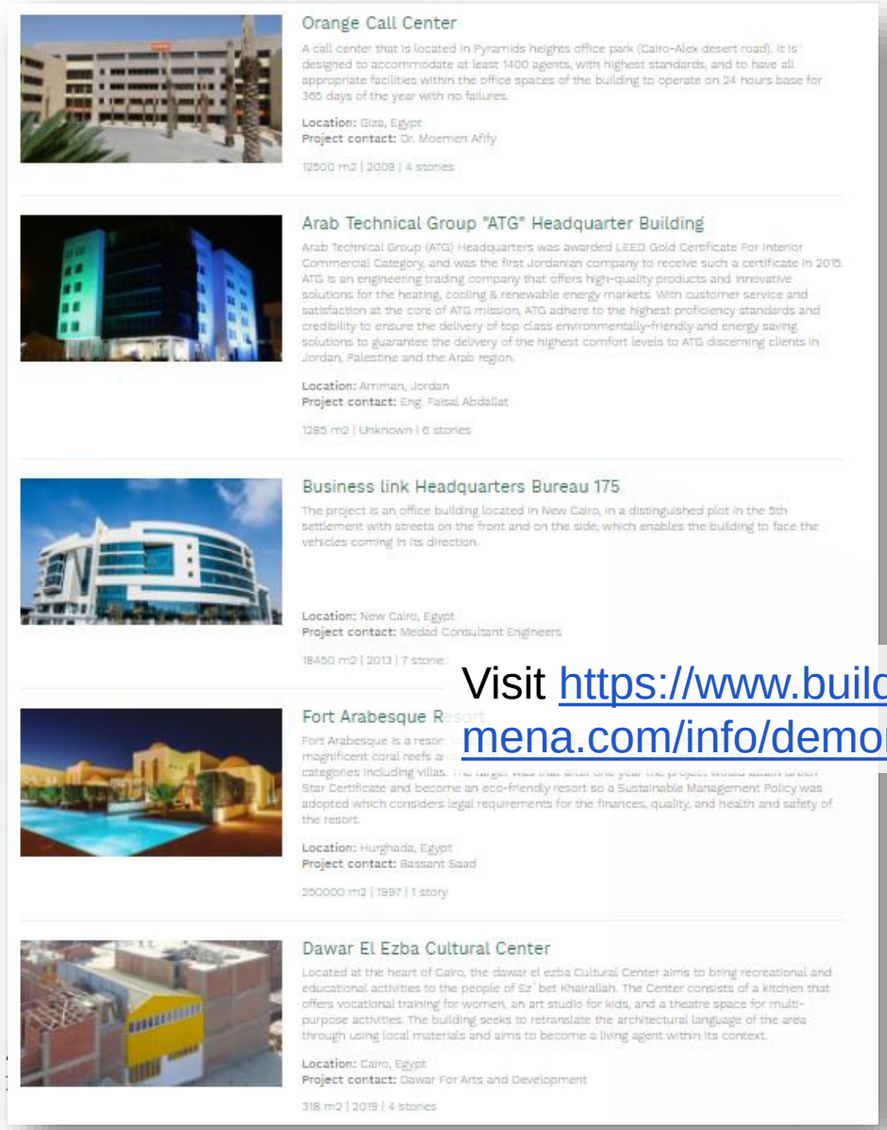
Demonstration project database

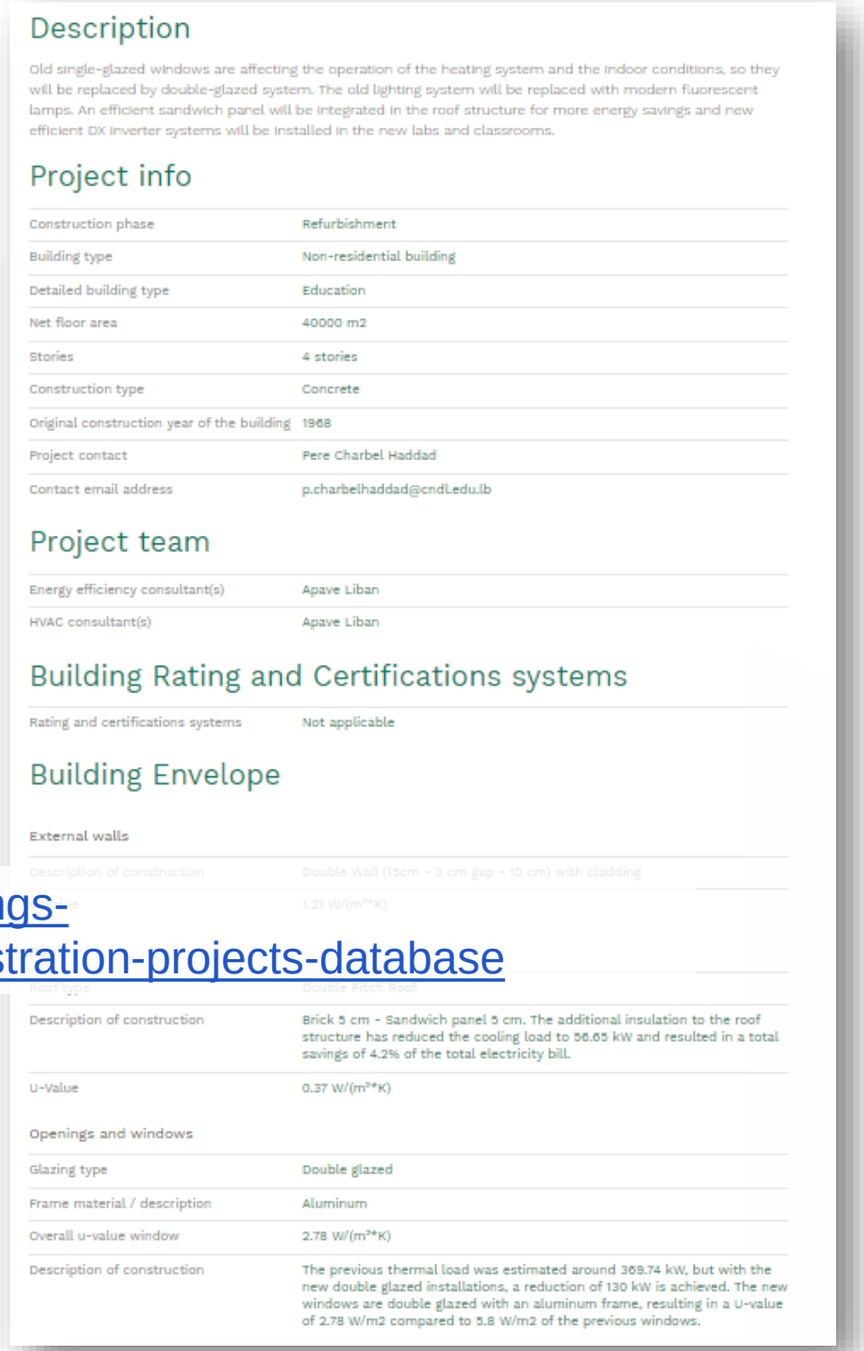
Crowd-sourced examples from the region

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



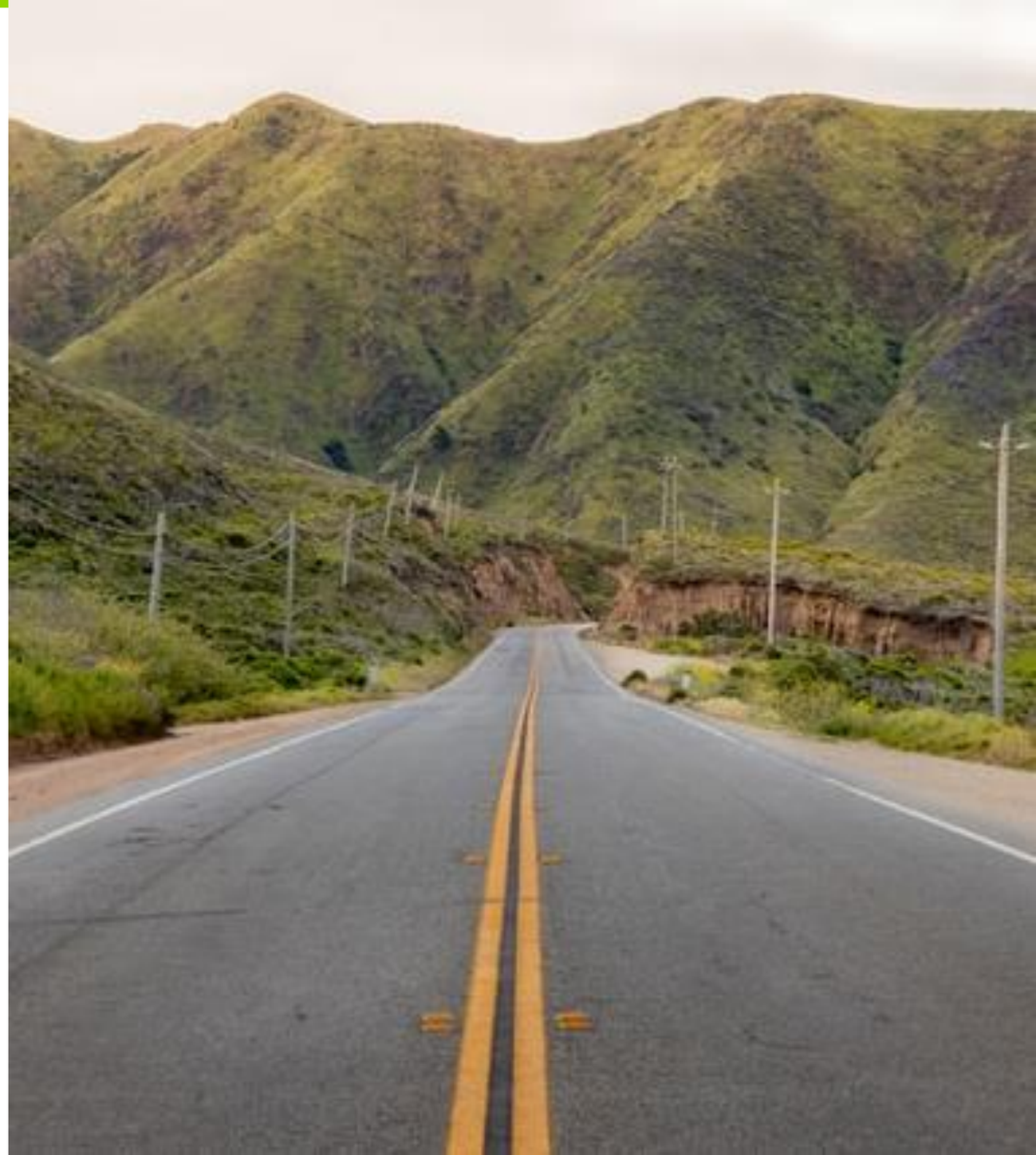


Visit https://www.buildings-mena.com/info/demonstration-projects-database

Guidehouse BUILD_ME

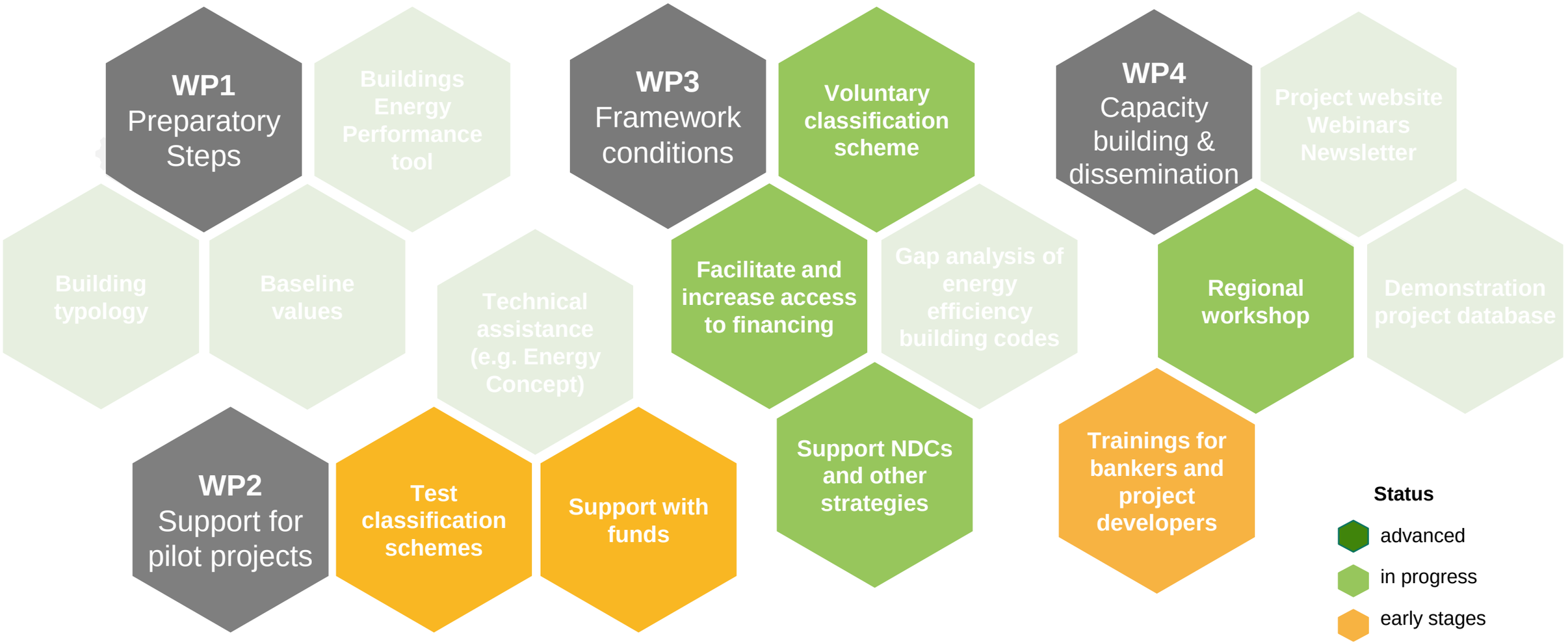
Wrap up

- Baseline and Building typology
- Energy efficiency building code
- Buildings Energy Performance tool
- Pilot projects
- Demonstration project database



Outlook

Where we're headed



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

Muhieddin Tawalbeh
m.tawalbeh@nerc.gov.jo

Riadh Bhar
riadh.bhar@guidehouse.com

Ali AlMarzouq
ali.marzouq@rss.jo

Marco Reiser
marco.reiser@guidehouse.com

Naela Al-Daoud
naela.daoud@rss.jo

Eslam Mahdy
eslam.mahdy@guidehouse.com

Husni Abzakh
husni@konn.tech

Kristen Brand
kristen.brand@guidehouse.com

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

الجمعيّة العِلميّة المَلكيّة
Royal Scientific Society

INTERNATIONAL CLIMATE INITIATIVE (IKI)

Supported by:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

based on a decision of the German Bundestag