Guidehouse

BUILD_ME

Climate-friendly buildings in the MENA region

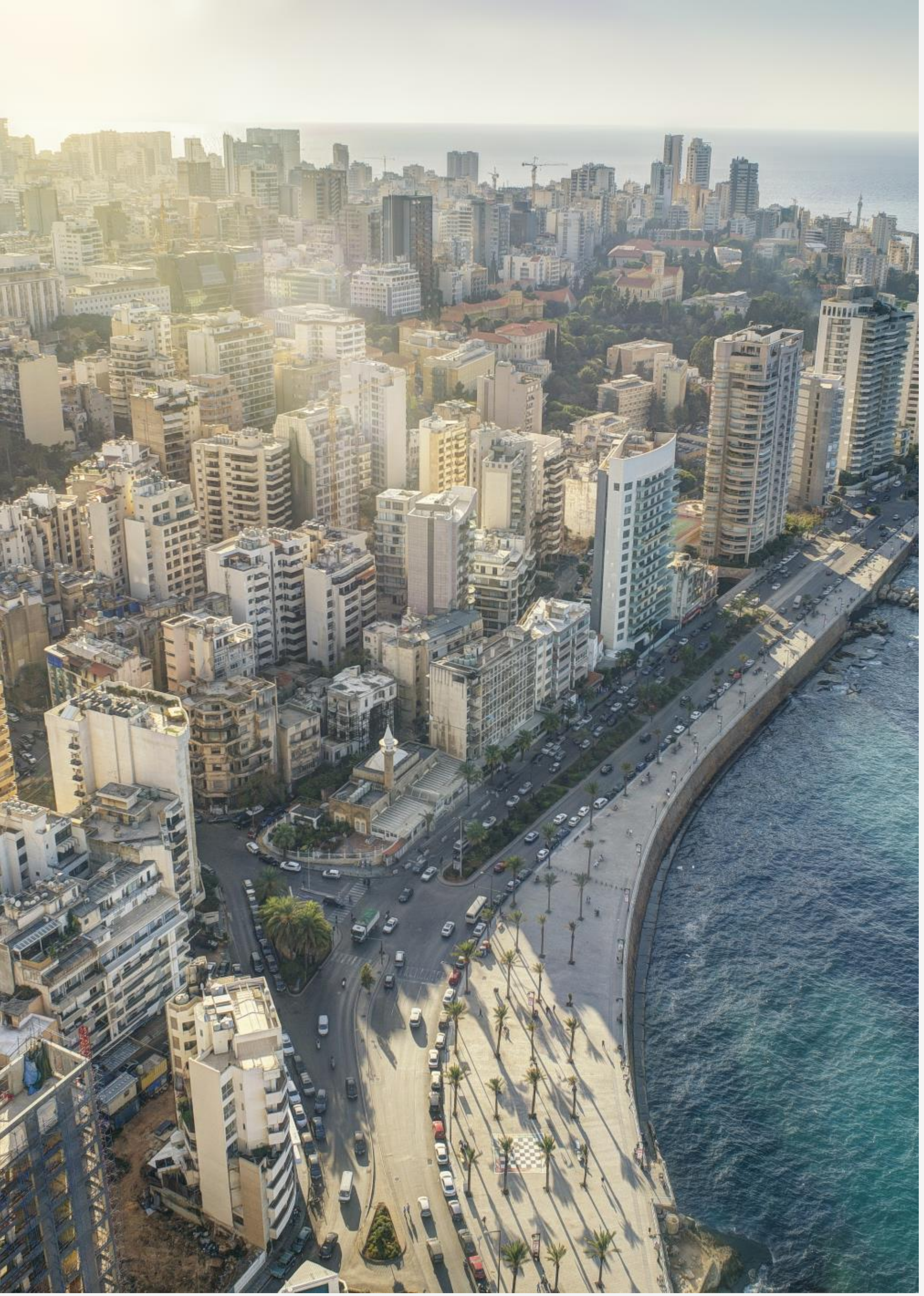
Tools to mobilise financing and accelerate energy efficiency

26 November 2020

Supported by:

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety

based on a decision of the German Bundestag



Agenda

- Overview of the BUILD_ME project
- Challenges and needs for financing energy efficient buildings
- Tools to mobilise financing and accelerate energy efficiency
- On the ground in Jordan: Konn Homes
- Q&A
- Outlook

Guidehouse at-a-glance

OUR COMPANY

50+

7,000+ employees

4

Forbes | 2019 AMERICA'S BEST MID-SIZE EMPLOYERS

Malcolm Baldrige National Quality Award

#10 Energy Consulting

#12 Healthcare Consulting

#20 Financial Consulting

OUR PEOPLE

33 languages fluently spoken

46% hold professional certifications

38% have advanced degrees

Commitment to Inclusion, Diversity, and Belonging

37% radically diverse

6 generations of professionals

49% female

51% male

7 employee affinity groups

5% Veteran & Active Duty

10 HRC consecutive perfect scores

BEST PLACES TO WORK 2019 for LGBTQ Equality 100% CORPORATE EQUALITY INDEX

Great Place to Work

Great Place To Work Certified

OUR CLIENTS

Healthcare:

7 of the top 10 hospital systems (by Member Hospital Beds)*

Financial Services:

8/10 of the largest U.S. banks

Life Sciences:

36 of the top 50 pharmaceutical companies**

Energy:

60 of the world's largest electric and gas utilities***

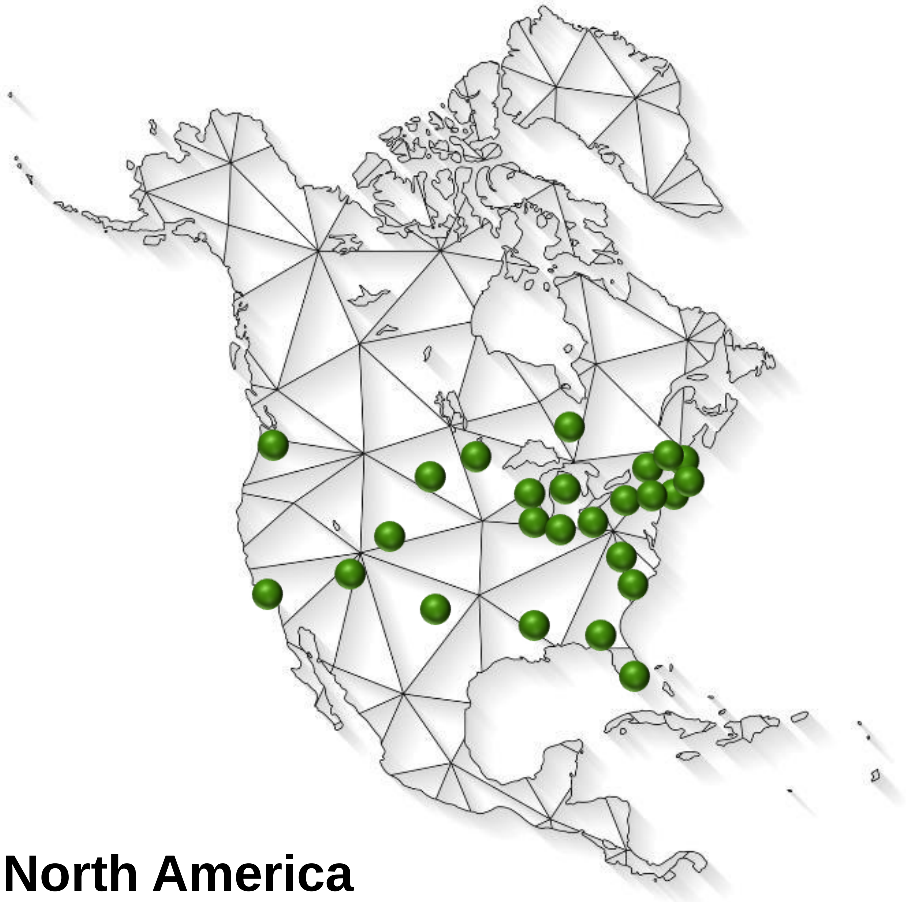
Public Sector:

European Commission

Federal Ministry for the Environment, Nature and Nuclear Safety

Federal Ministry for Economic Affairs and Energy

Our Locations



North America

Canada: Ontario

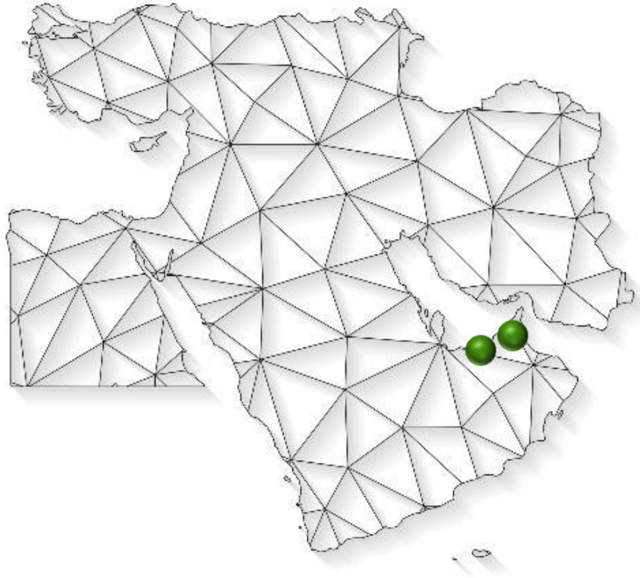
US: Alabama, Arizona, California, Colorado, District of Columbia, Florida, Georgia, Illinois, Indiana, Maryland, Massachusetts, Michigan, Minnesota, New Jersey, New York, North Carolina, Ohio, Pennsylvania, South Dakota, Texas, Vermont, Virginia, Washington, Wisconsin

Europe

Germany: Berlin, Cologne
The Netherlands: Utrecht
United Kingdom: London

Asia

China: Beijing, Shanghai
India: Nagercoil, Trivandrum
South Korea: Seoul



Middle East

United Arab Emirates:
Abu Dhabi, Dubai

Today's speakers

Experts on buildings, financing, and the MENA region

Carsten Petersdorff

Director

Guidehouse

Miroslav Maly

Associated Director, Green Financing Facilities Energy Efficiency and Climate Change Team

EBRD

Nesen Surmeli-Anac

Managing Consultant

Guidehouse

Marco Reiser

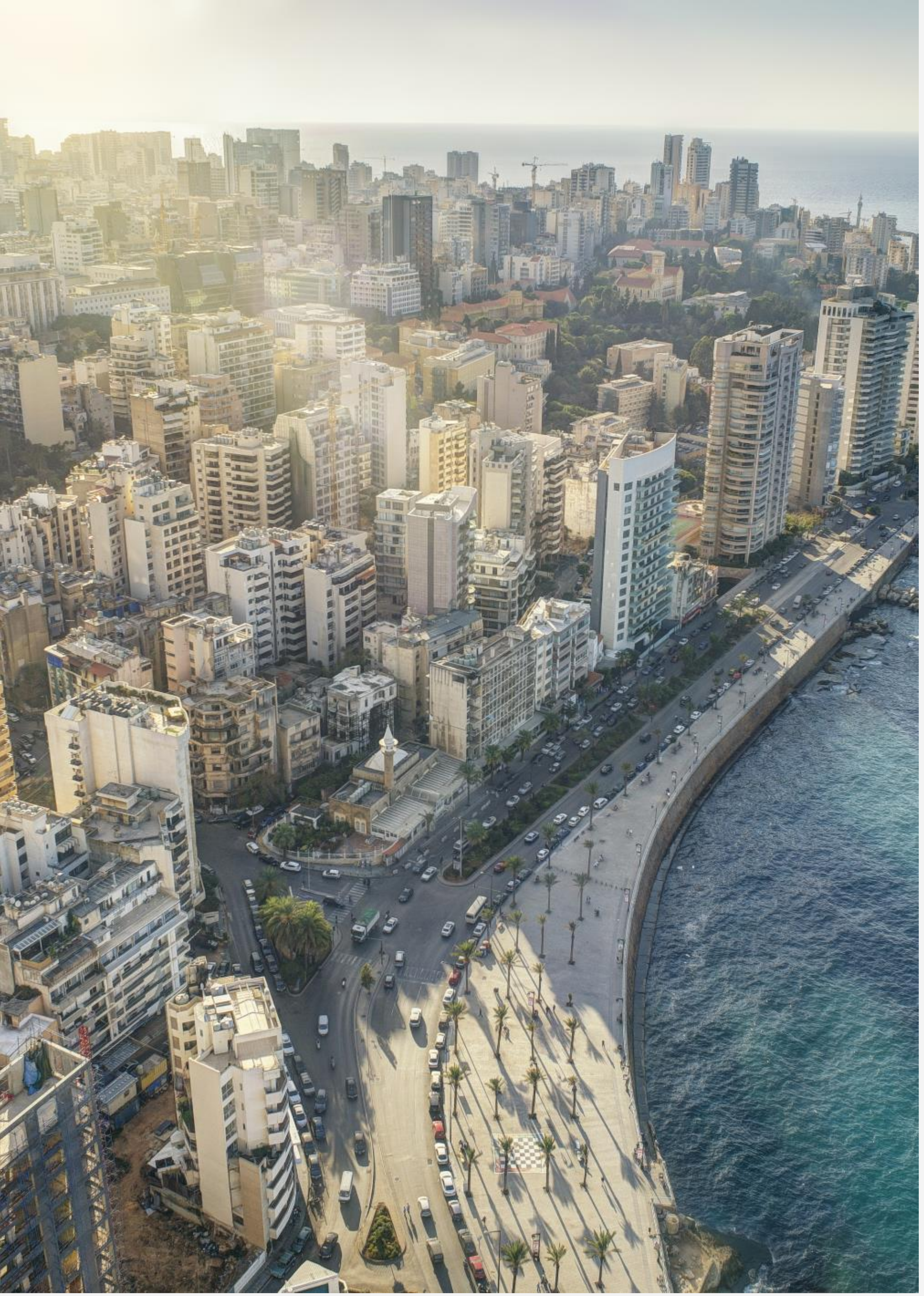
Consultant

Guidehouse

Husni Abzakh

Design and Assembly Architect

Konn Technologies



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Guidehouse BUILD_ME

Overview of the BUILD_ME project

Guidehouse BUILD_ME

Overview

BUILD_ME project purpose

Buildings account for ~40% of global **GHG emissions**

The long lifetime of buildings leads to a **lock-in effect** – if the right measures are not taken now, the Paris goals will be unattainable

The **MENA region** is especially exposed to such risks due to strong population and economic growth as well as rising heating and cooling demand

BUILD_ME supports MENA countries in reaching a nearly-zero energy buildings sector

Overview about the project

Fund

IKI International Climate Initiative,
German Federal Ministry of Environment

Supported by:

Federal Ministry
for the Environment, Nature Conservation
and Nuclear Safety

based on a decision of the German Bundestag

Scope

1st Phase: 2016 - 2018

2nd Phase: 2019 - 2021

Partners

HBRC

IDG MATRIX Integrated Development Group

Royal Scientific Society

LCEC

European Bank for Reconstruction and Development

Guidehouse

TRACK

ALCOR

RCREEE

EGYPT GBC

LGBC

BUILD_ME

BUILD_ME scope

Approach

Original Project

2016 - 2018

- Extensive analysis and research
- Identification of barriers
- Recommendations

Project Extension

2019 – 2021

- Implementation of recommendations
- Dissemination of results
- Upscaling

Key insights from Phase I

Approach

Project developers	Financial institutes (FI)	Policy and decision makers
• **Low cost packages** in average can already **save 30%** of energy costs. • Investments of „nZEB variants“ **only 10-15% higher** than baseline • **End users** are often responsible for **purchasing HVAC technologies**, separately from apartment	• Funds are available but instruments are missing to prove eligibility. Process too complex for rather small building projects • **Capacity building FI** staff: Improve the knowledge on energy efficiency • Facilitate process to check **fulfilment of eligibility criteria** • Merchandise **financing option for building EE** measures and incorporate in your portfolio	• Update/develop **building codes** and improve their enforcement • Formulate **benchmarks** and develop a **classification scheme** • Lack of **quantified (GHG) saving potentials** for the building sector in policy strategies

Logic of activities

Approach

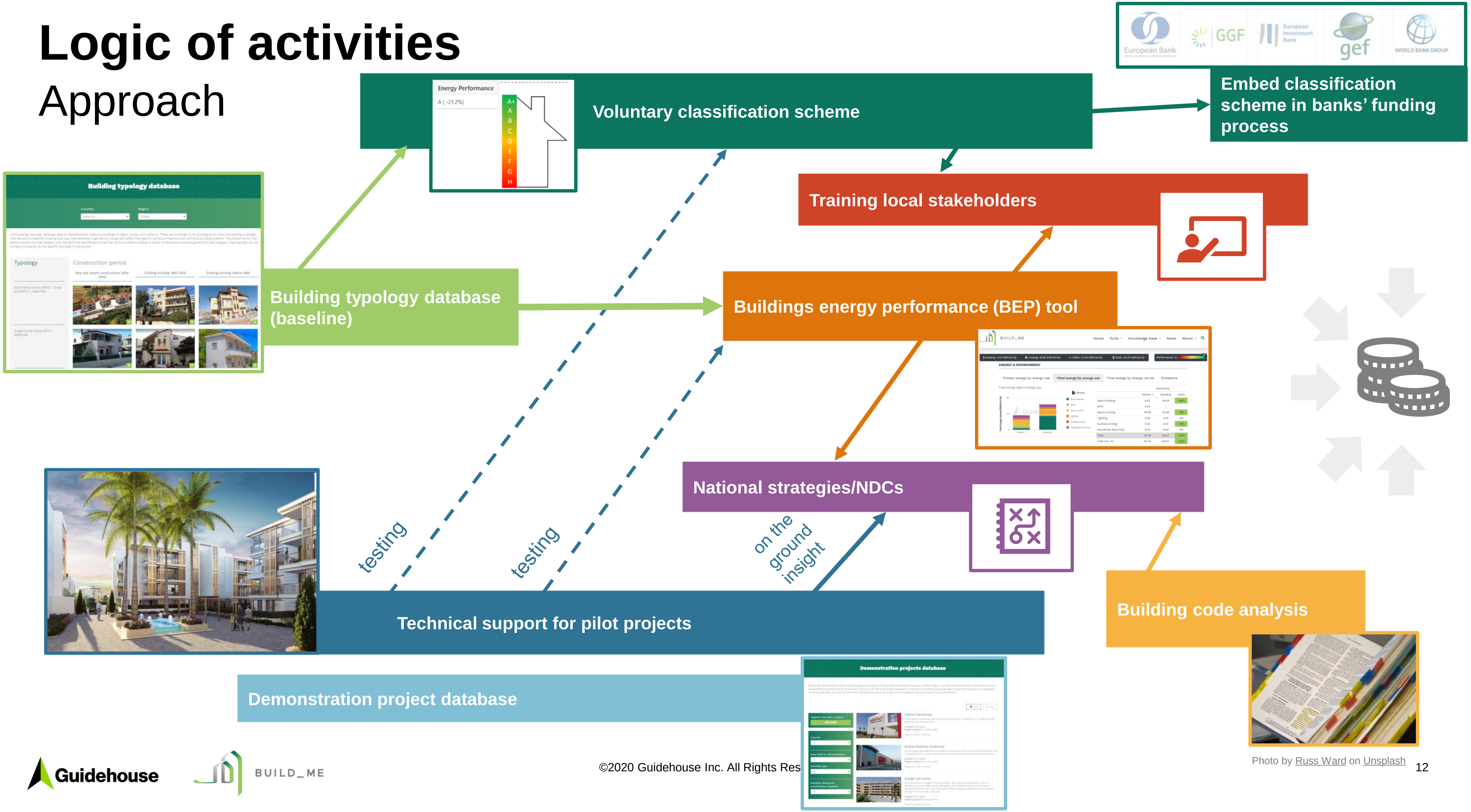


Photo by Russ Ward on Unsplash

Pilot projects

Alexandria

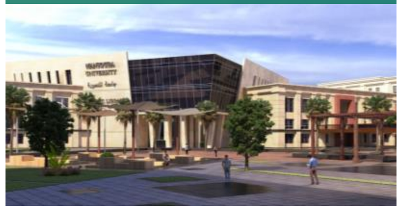
Palm Hills, Alexanderia

Beverly Hills - 229

Heliopolis Residence

Mansoura

New Mansoura University



Greater Cairo

Cairo West Residence

Palm Hills, Badya

Amman

KONN Modular Houses

Private Residence

Dar Al-Oqoud

Tabarja

Kye Beachfront Resort

Beirut

City Towers Project

Arcade Suites II

Extension of Collège Notre Dame De Nazareth

Frames / Baasir

KLEOS / Ashrafieh Appartments

Guidehouse BUILD_ME

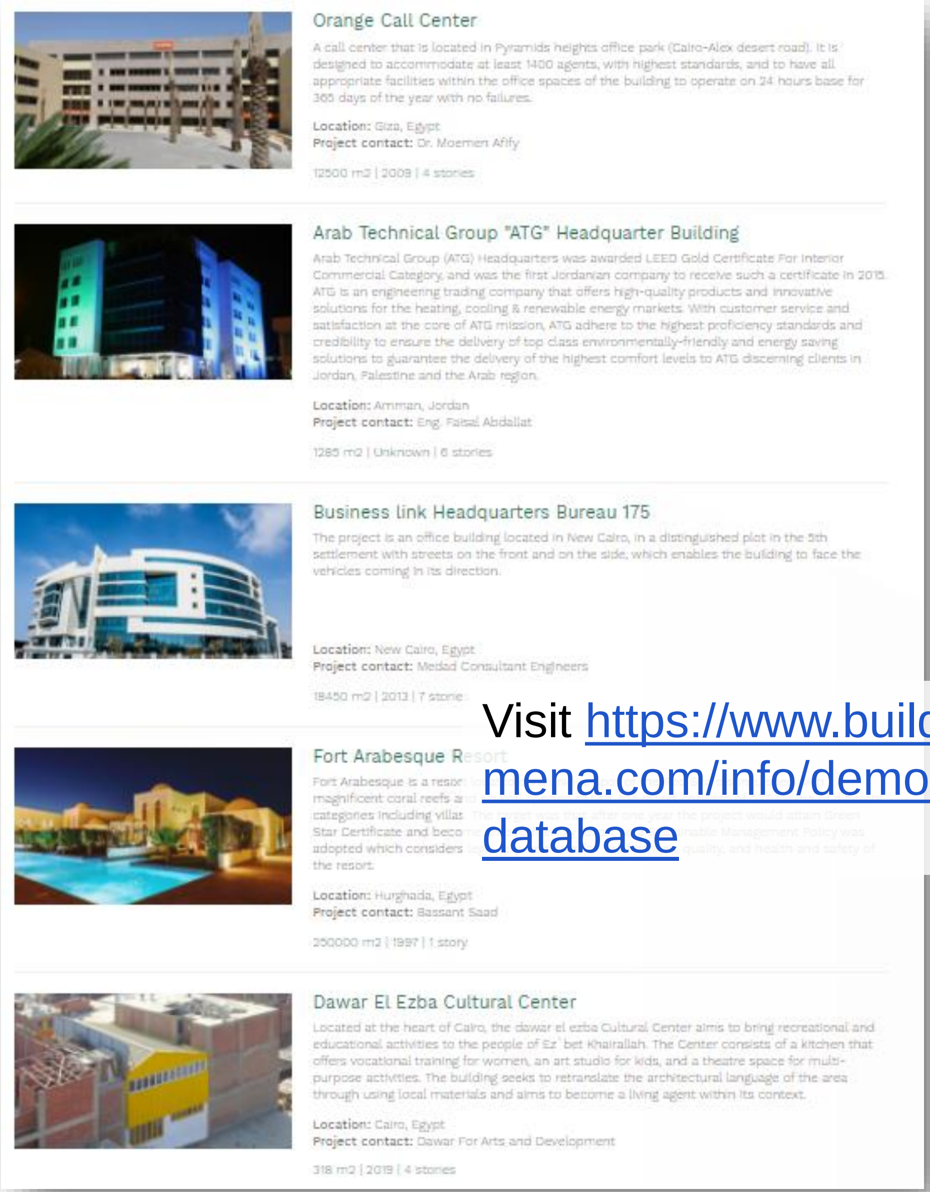
Demonstration project database

Crowd-sourced examples from the region

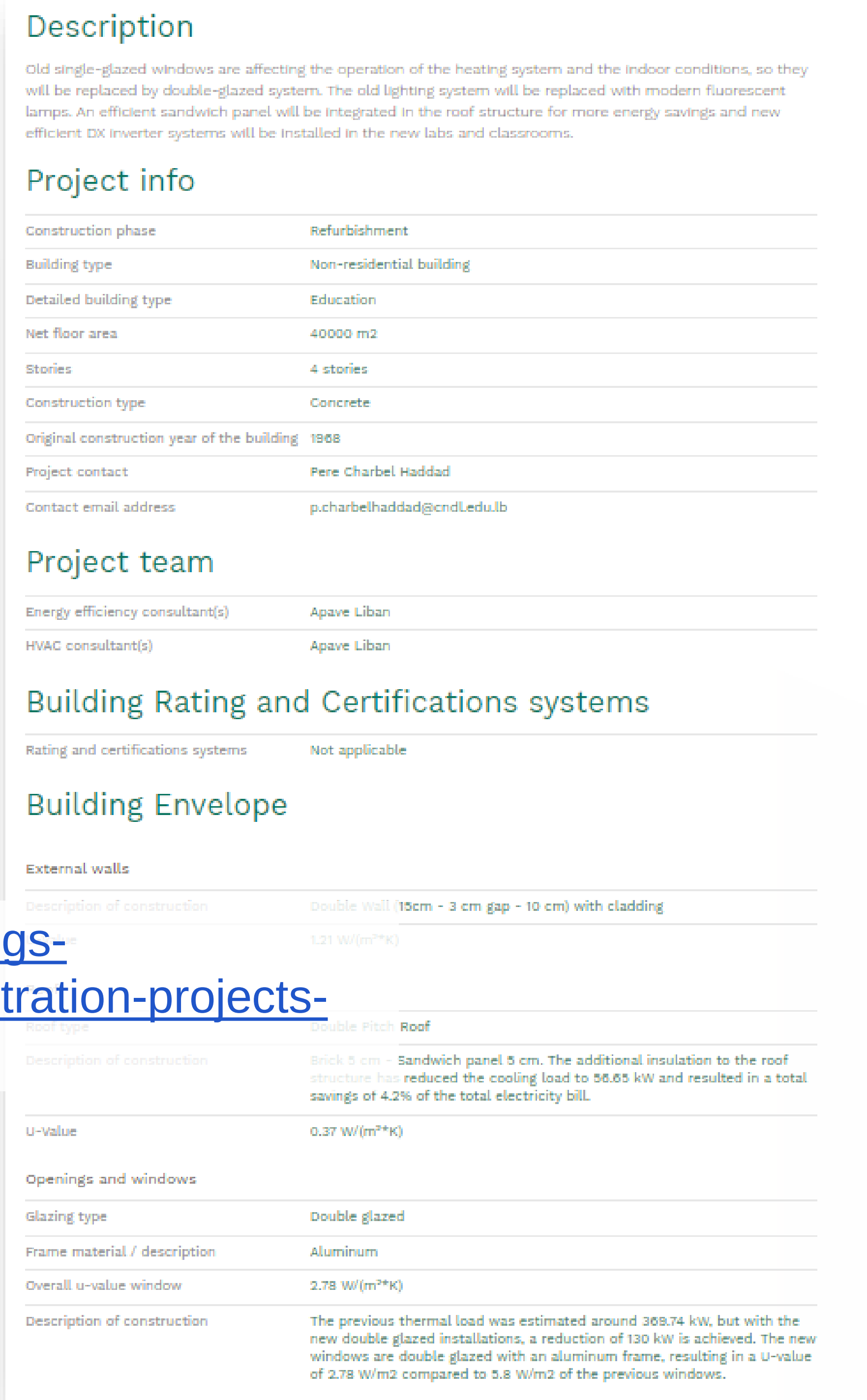
Register and add a project

ADD NOW!

- Searchable database of practical inspiration
- Welcome input from project developers, architects or contractors from across the region
- Currently 30 examples



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



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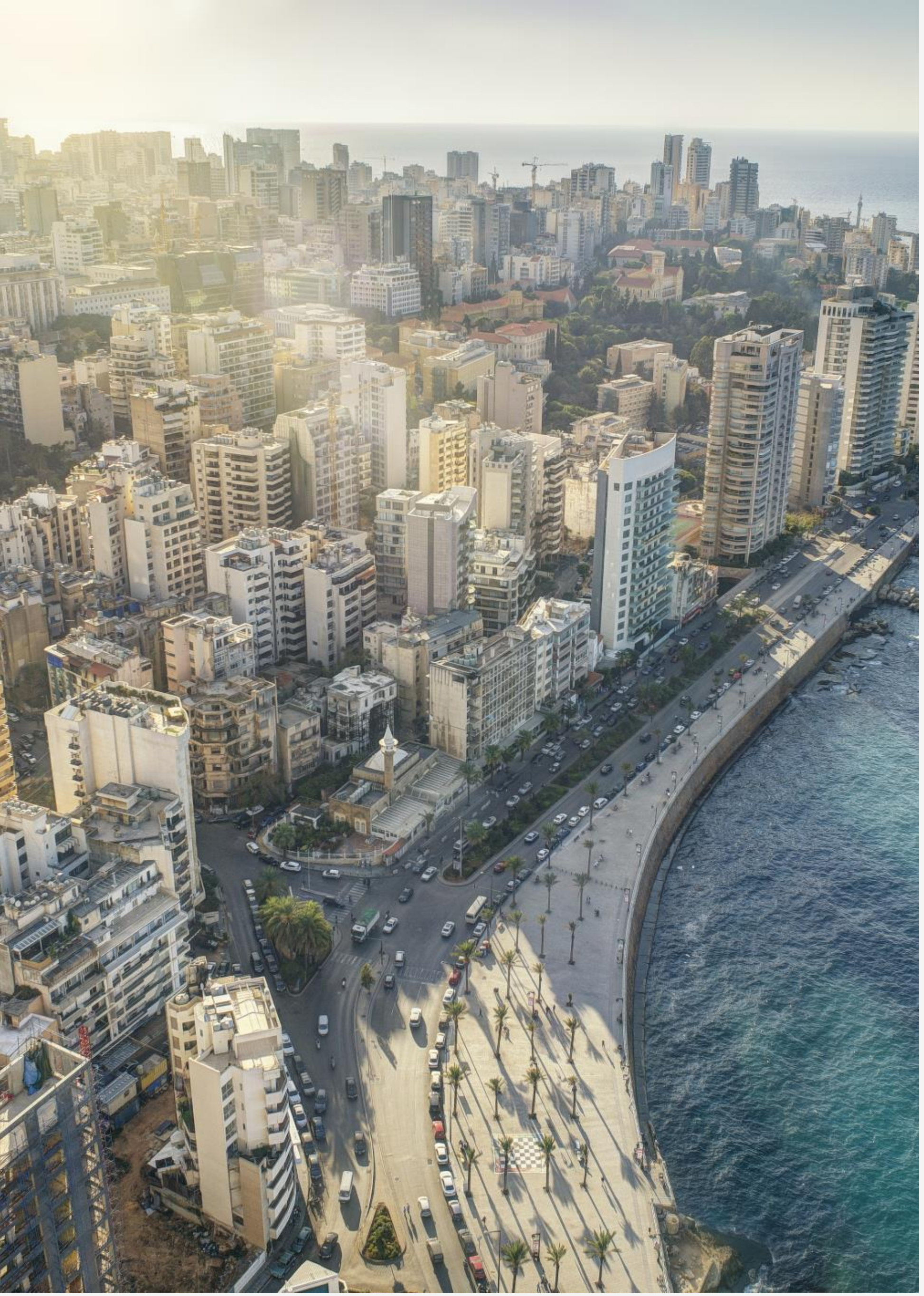
BUILD_ME



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Outlook

Challenges and needs for financing energy efficiency building projects in the region

Webinar: Climate-friendly buildings in the MENA region: Tools to mobilise finance and accelerate energy efficiency

Miroslav Maly, Thomas Bouriot

Energy Efficiency and Climate Change team

European Bank
for Reconstruction and Development

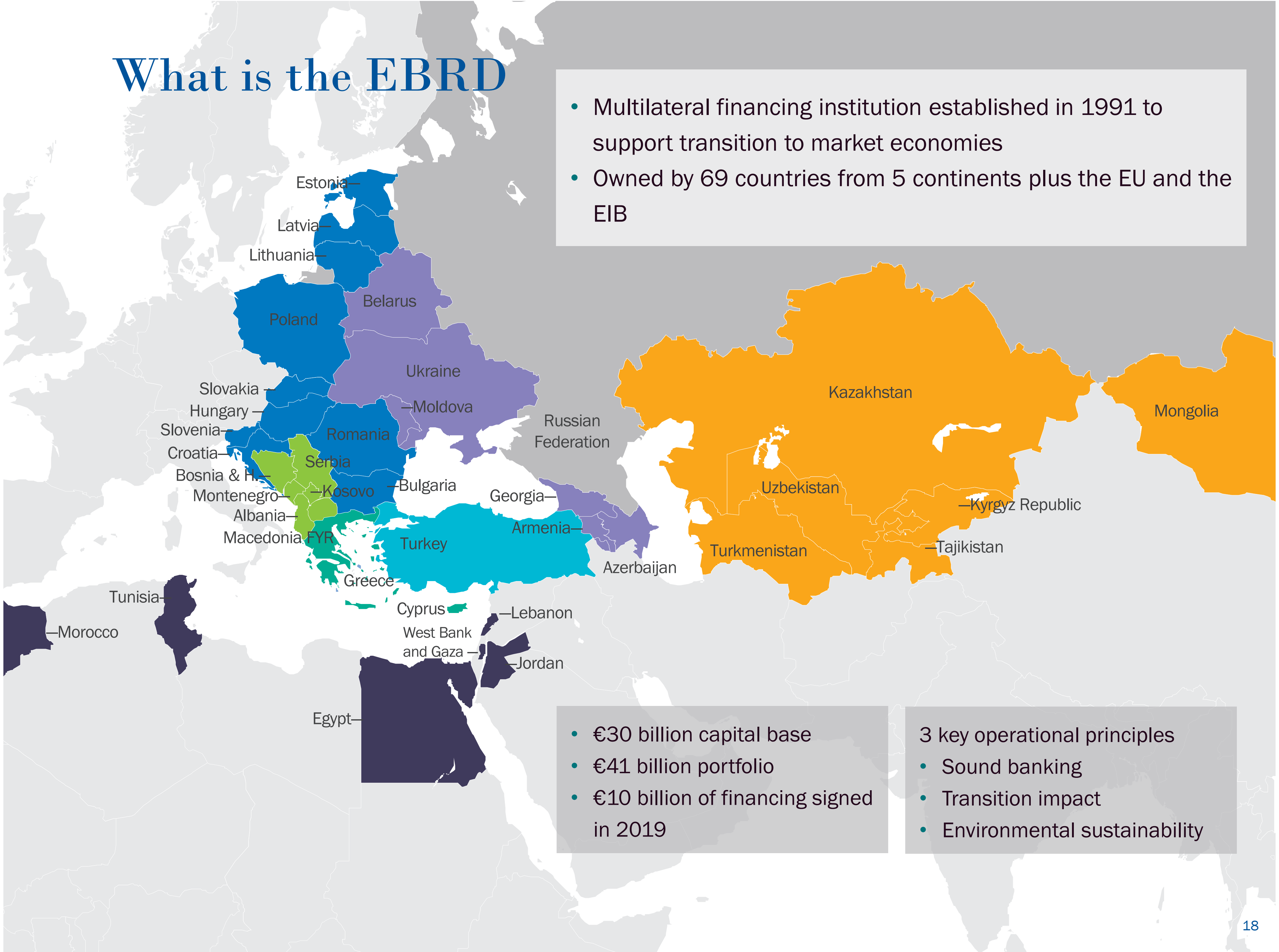
Contents

European Bank
for Reconstruction and Development

- Introduction to the EBRD
- EBRD's green financing
- Our success to date
- Climate change and buildings
- Challenges of financing energy efficiency building projects in the region
- What EBRD offers and case studies

What is the EBRD

- Multilateral financing institution established in 1991 to support transition to market economies
- Owned by 69 countries from 5 continents plus the EU and the EIB



- €30 billion capital base
- €41 billion portfolio
- €10 billion of financing signed in 2019

3 key operational principles

- Sound banking
- Transition impact
- Environmental sustainability

The Green Economy Transition 2021-2025

European Bank
for Reconstruction and Development

- **The Green Economy Transition (GET) 2021-25** is the Bank's new approach for helping economies where the EBRD works **build green, low carbon and resilient economies.**
- Through the new GET approach, the **EBRD will increase green financing to more than 50 per cent** of its annual business volume by 2025.
- It also aims to **reach net annual GHG emissions reductions of at least 25 million tonnes** over the five-year period.
- The new **GET approach takes into account the context brought about by COVID-19** highlighting areas of opportunity **to support a green recovery**.

The Green Economy Transition

The GET is EBRD’s strategy to mainstream across the activities of the Bank, and to increase the share of Bank business represented by projects which have beneficial impacts on the environment or in terms of climate change. Green projects can be from the following areas:

- Energy efficiency
- Renewable energy
- Water efficiency
- Resilience to climate change
- Waste minimisation and material efficiency
- Pollution control and environmental compliance

Our success to date

European Bank
for Reconstruction and Development

- EBRD’s has a long track record of financing green investments.
- To date, the EBRD has signed **€36 billion in green investments** and **financed over 2,000 green projects***, which are expected to **reduce 104 million tonnes of carbon emissions yearly**.
- **In 2019 alone**, the Bank financed **over 2.2 GW of new renewable power capacity**, and aims to exceed that in 2020.

* Each Green Economy Financing Facility (GEFF credit line) is 1 project. So far nearly 190,000 Sub-projects and €4.5 billion have been financed under GEFF

Climate change: Impact of buildings

European Bank
for Reconstruction and Development

- **Buildings use about**
  - **40% of global energy,**
  - **25% of global water,**
  - **40% of global resources,**
  - **and they emit approximately 1/3 of GHG emissions.**
- Under business-as-usual projections, **use of energy** in buildings globally could **double or even triple by 2050**.
- Drivers include **billions** of people acquiring **adequate housing and access to electricity**.

Climate change: Impact on buildings

European Bank
for Reconstruction and Development

- Buildings have already experienced **a big increase in extreme weather damage in recent decades.**
- **Buildings face major risks of damage** from the projected impacts of climate change.
- **Impacts and risks** include:
  - Increased **precipitation/droughts**
  - Thawing **permafrost**
  - **Urban Heat Island** effect
  - **Wildfires**
  - Stronger **winds and severe storms**
  - **Floods**
- There is likely to be **significant regional variation** in the intensity and nature of such impacts.

Climate change: Mitigation options relevant to buildings

European Bank
for Reconstruction and Development

- **Energy consumption in buildings can be reduced by 30 to 80%** using proven and commercially available technologies.
- The buildings sector offers **near-term, highly cost-effective opportunities to curb energy-demand growth rates**, even to reverse them in developed economies.
- Widespread implementation of best practices and technologies could see energy use in buildings stabilise or even fall by 2050.
- Mitigation options offer multiple co-benefits:
  - Higher **asset values**
  - Lower **energy bills**
  - More **jobs**
  - Improved **energy security**
  - Improved **productivity of commercial building occupants**
  - Better **living and working conditions** for owners and tenants

Challenges of financing Energy Efficiency building projects I

European Bank
for Reconstruction and Development

1. Missing appropriate regulatory framework

The regulatory framework may create many potential barriers to attracting investment in the efficient building sector. Legislation may discourage investment in energy efficiency, or simply not be optimal for promoting investment. This may be on account of the distribution of legal rights between tenants and owners, restrictions on investments due to permits and bureaucracy, non-existence of standards or difficulty of their implementation or lack of their enforcement.

2. Non-proper understanding of the market when developing support system

The development of effective support instruments requires a detailed analysis of the market gap. A wrongly designed instrument can fail to create any impact or may have negative impact. A detailed impact assessment is thus necessary.

3. Energy poverty and low incomes

Energy poverty is an important barrier for programmes needing to attract private investment. For this reason, the design of the instruments requires a well designed social component to accompany the loan-based system or social rent system to address the needs of the poorest.

4. Financial risks

Financial risks are associated with the level of returns that the project might generate. Nevertheless, estimating the return on investment (ROI) on the basis of annual net energy savings is a more difficult exercise than determining the expected cash flow generated by a project. The annual net energy saving, indeed, depends on other factors, such as stakeholder behaviour. A certain level of uncertainty is embedded in energy efficiency projects.

Challenges of financing Energy Efficiency building projects II

European Bank
for Reconstruction and Development

5. Lack of skilled workforce

An implementation of EE measures requires skilled workers that may not be available and an extensive training and certification is needed (e.g. in Turkey thermal insulation of building and implementation of efficient windows can only be done by certified companies using certified equipment and materials and skilled workers)

6. Split incentives and common decision-making

Projects for energy efficiency in buildings often face the well-known split incentives between owners and tenants. Tenants do not want to install a more efficient system, because the return on their investment will be taken by the next tenant. Owners are not interested in installing energy efficiency systems because energy use is paid by the tenants. One way to avoid split incentives is to involve owners and tenants in the project development process or have a legal framework that facilitates decision-making and encourages owners to make EE investments.

7. Technical market fragmentation

Lack of standardization with regards to technologies and implementation processes, generating limited control on project development costs, quality and achieved energy performance.

8. Lack of one-stop-shops, structured databases and reliable tools

To make the investors journey easier, evaluating the combined effect of energy efficiency in terms of real estate increased value, operation and management (O&M) cost reduction, increased productivity of the building and other non-energy related benefits.

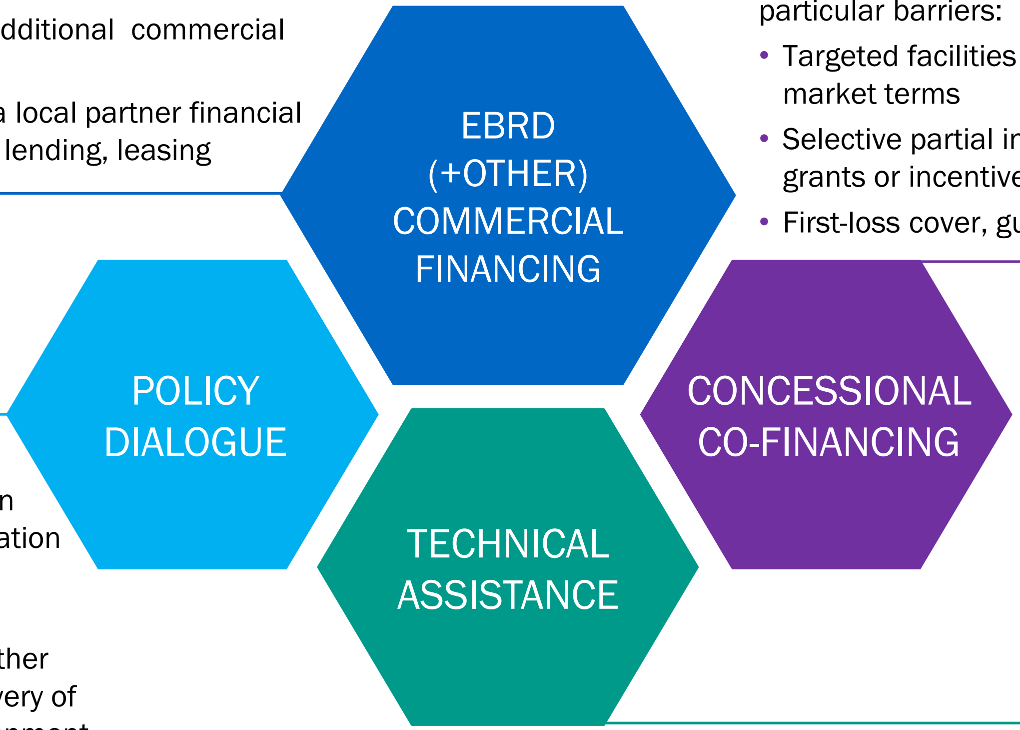
9. Lack of awareness on regulatory framework, technical measures and financial options

The EBRD business model

- EBRD direct finance: loans, equity investments, guarantees, bonds
- Mobilising additional commercial sources
- Indirectly via local partner financial institutions: lending, leasing

For eligible investments which face particular barriers:

- Targeted facilities priced below market terms
- Selective partial investment grants or incentive payments
- First-loss cover, guarantees



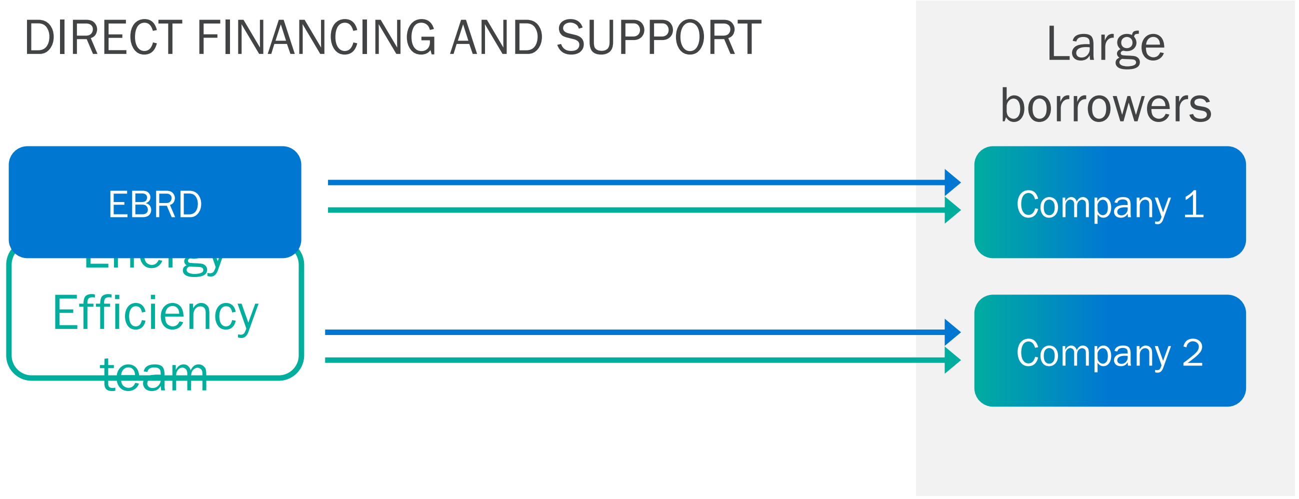
- Working with governments on optimum legislation for green investments
- Working with other donors on delivery of enabling environment for green investments
- Supporting the development of legal instruments and best practice guidelines

- Resource efficiency audits
- Climate vulnerability assessment
- Capacity building for local financial institutions (staff training, marketing, green retail lending products)
- Green Technology Selector tool
- Project structuring support (e.g. tendering, monitoring)
- Support to adopt operational or CSR-type standards (energy management, buildings certification, reporting)

The EBRD Financing Channels

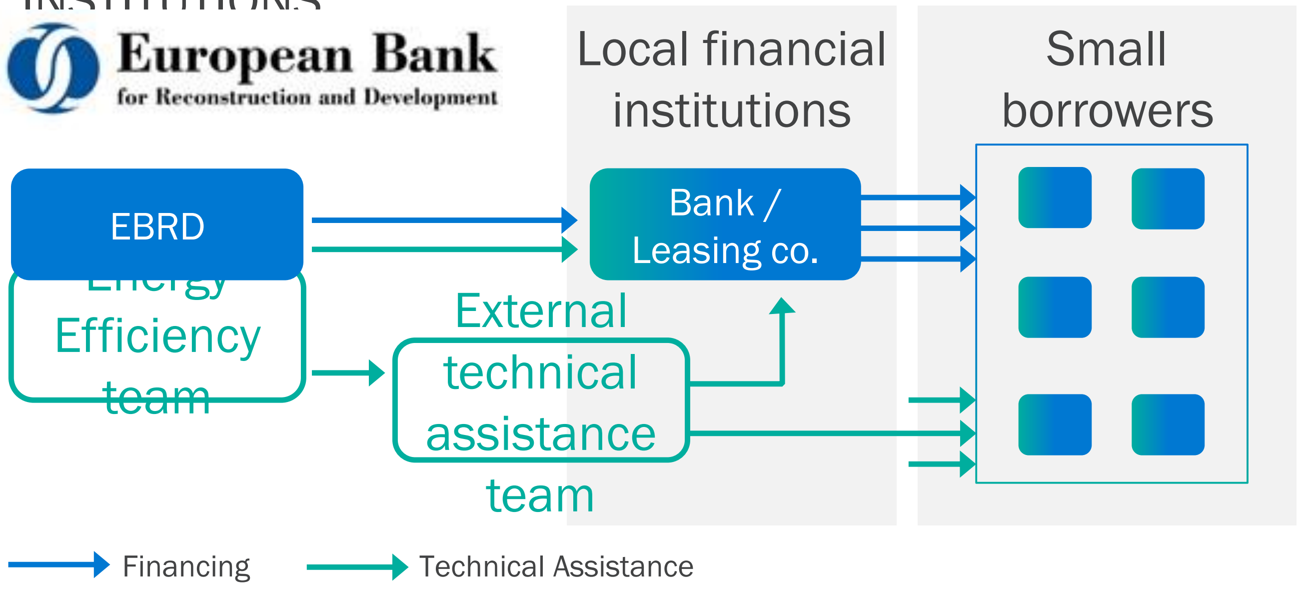
European Bank
for Reconstruction and Development

DIRECT FINANCING AND SUPPORT



FINANCING VIA PARTNER FINANCIAL INSTITUTIONS

GEFF Green Economy Financing Facility | European Bank for Reconstruction and Development



Eligibility requirements - rehabilitation of existing buildings

European Bank
for Reconstruction and Development

Partial financing of specific technologies and materials

- May be financed on components-basis (windows, thermal insulation, PV, SWH, cooling/heating/air ventilation, etc.)
- Based on Green Technology Selector eligible technologies and measures
- https://techselector.com/ts-en/

Complete financing of building rehabilitation - 100% of investment is eligible for financing if:

- The performance is increased to the EU standard, pro-rata if above national standards but below EU standards
- Received LEED, BREEAM or EDGE certificate (level regional specific) or relevant international/local certification if they meet similar standards
- Received passive house certification
- Received EPC class B (for countries with EPC regulations) or
- EPC class B (for countries without EPC regulations) based on an EPC country with similar level of development
- Energy saving of 30% compared to baseline performance, via any combination of energy efficiency or renewable energy measures

Eligibility requirements - New buildings

European Bank
for Reconstruction and Development

Partial financing of specific technologies and materials

- Up to 30% of investment is eligible for financing (Excluding land acquisition costs)
    - Financed on components-basis (Green technology Selector (eligible technologies and measures)

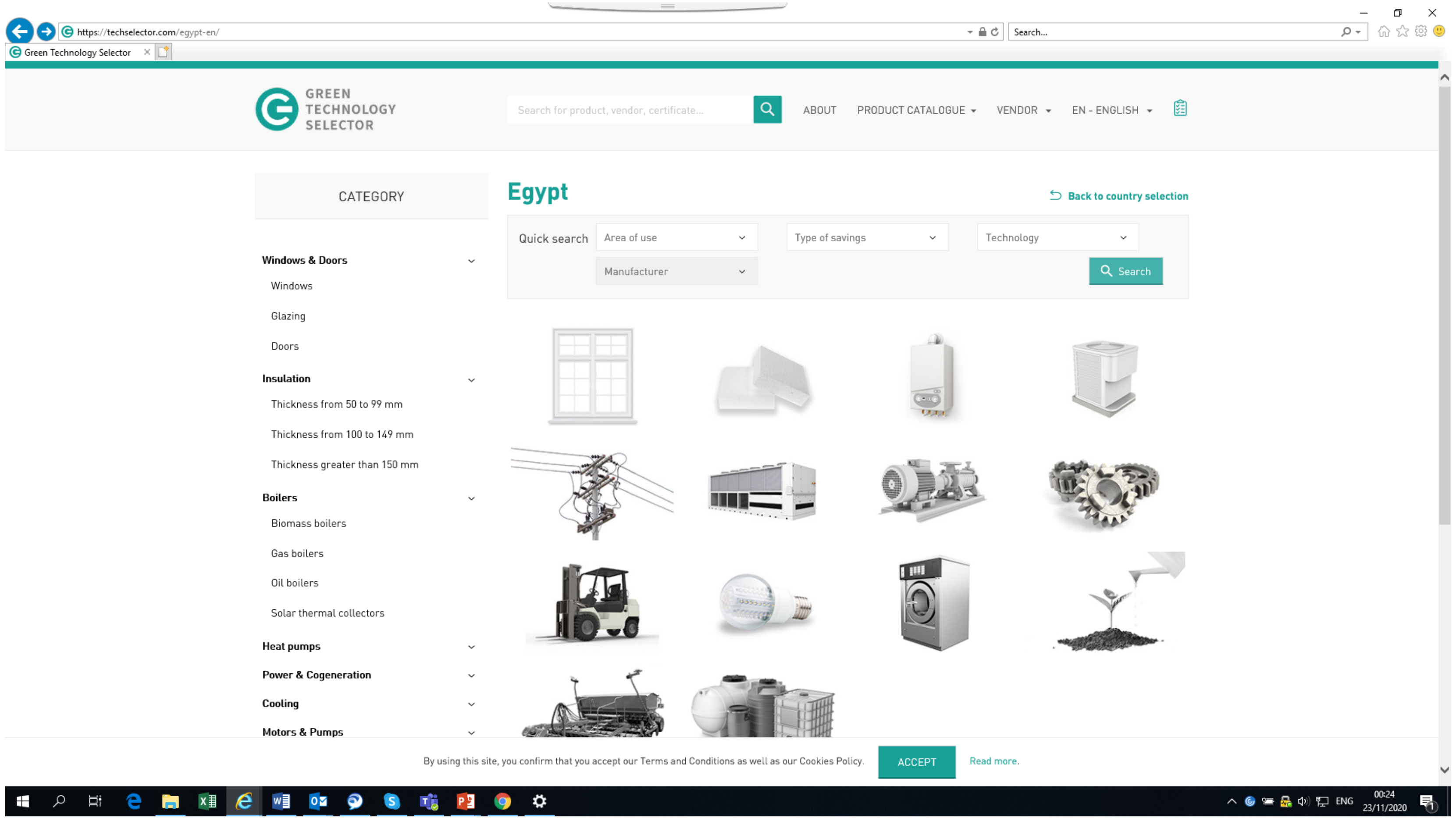
Complete financing of new building - 100% of investment is eligible for financing if:

- The performance is increased to the EU standard, pro-rata if above national standards but below EU standards
- Received LEED, BREEAM or EDGE certificate (level regional specific) or relevant international/local certification if they meet similar standards
- Received passive house certification
- Received EPC class B (for countries with EPC regulations) or EPC class B (for countries without EPC regulations) based on an EPC country with similar level of development

Green Technology Selector

European Bank
for Reconstruction and Development

- https://techselector.com/ts-en/



Sustainable building design support - Cairo for Investment and Real Estate Development (CIRA)

European Bank
for Reconstruction and Development

CLIENT

CIRA is the largest integrated, affordable private education provider in Egypt, operating in both the K-12 and higher education segments.

PROJECT

The EUR 25 million loan will finance the establishment of a new university in Assiut (Upper Egypt) to replicate the existing Badr University in Cairo in Greater Cairo ("BUC").

The EBRD will provide technical assistance to:

- Optimise the energy performance of existing Badr University
- Support the procurement of a solar plant on Badr University
- Provide low carbon and climate resilience design advice
- Procurement support to achieve green certification (EDGE) for the new Assiut Campus

TECHNOLOGY TRANSFER SUPPORT

The project benefits from partial grant support from EBRD's FINTECC programme which aims to accelerate the uptake of advanced resources efficiency technologies in countries with low market penetration levels and underdeveloped supply chains.

CAIRO
For Investment & Real Estate
Development S.A.E.

INVESTMENT PLAN

EBRD loan	EUR 25 million
of which FINTECC grant	EUR 0.4 million
Total project value	EUR 65 million

Urban Regeneration: Integrating resource efficiency and climate resilience in buildings in Jordan

European Bank
for Reconstruction and Development

CLIENT

A Jordanian shareholding company, majority owned by a leading private real estate developer in the MENA region, and partially by a state-owned corporation established to drive urban regeneration projects.

PROJECT

Support for the construction of a retail and entertainment centre as part of the larger Abdali Urban Regeneration Project in Amman. This is the largest mixed-use development undertaken in Jordan.

EBRD involvement contributed with special emphasis on climate resilience and sustainable resource use:

- Energy efficient design: highly efficient heating and cooling system design, use of natural light.
- Materials efficiency: use of GGBS concrete (ground-granulated blast furnace slag, a metallurgical by-product), recyclable polyester roofing;
- Water efficiency: rain water harvesting, grey water recycling.

INVESTMENT PLAN

EBRD loan	US$ 80 million
of which environmental financing	US$ 52 million
External	US$ 239million
Total project value	US$ 319million

IMPACT OF PROJECT

- Energy savings amount to 19,200 MWh/year
- Advanced efficiency measures in electrical systems and district heating and cooling design will lead to 6,000 tCO_2 emission reductions annually.
- Water efficiency measures enhance regional resilience to increasing water stress. Water savings amount to 2,400 m^3/year
- The mix of materials used will result in an overall carbon footprint 10% lower than common practice.

Questions

European Bank
for Reconstruction and Development

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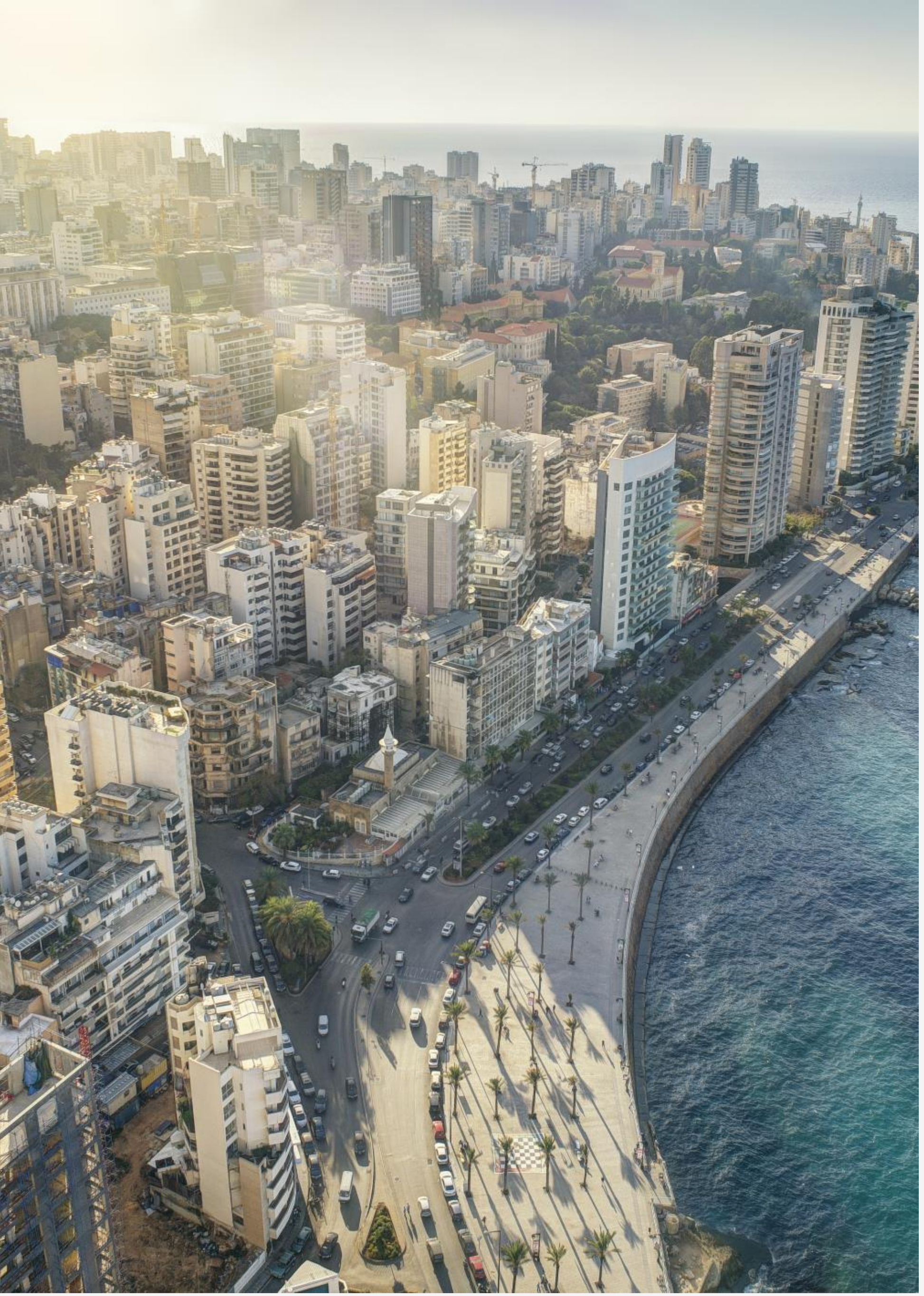

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Nesen Surmeli-Anac & Marco Reiser, Guidehouse

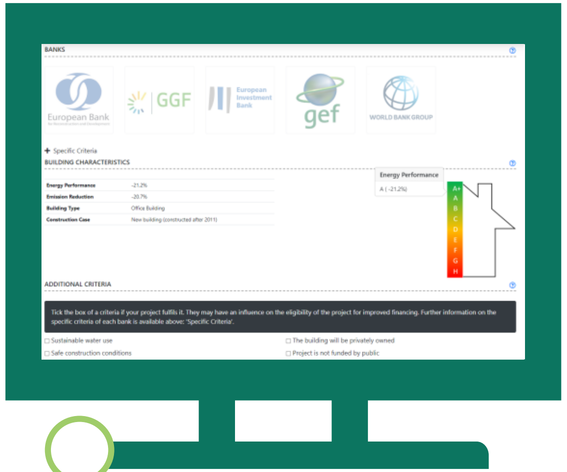
Photo by Lukas Blazek on Unsplash

Guidehouse BUILD_ME

Easier access to financing for energy efficient buildings

Approach

How to design and finance an energy efficient project?



BEP Tool shows:

- ✓ [25]% energy saving in comparison with **baseline**
- ✓ Financing available at local bank

Intermediating **bank grants credit** based on trusted classification scheme

Project is realized as energy efficient building

BUILD_ME classification scheme approach

Facilitate access to financing

Learning from best case practices and planning for strength factors in operation

Optimized Scheme operation

BEP Tool: Robust Methodology

Utilizing reliable technical knowledge for calculating the building energy performance

Identifying issues and improving scheme before full roll out

Pilot Phase and Projects

Building stock Typology

Adapted to the national conditions

Providing comparability with different countries

Enabling conditions for EE financing

Tailored to FIs Lending Criteria

Building Baseline Definition

Creating accurate presentation of baseline cases

Analysis of existing certification systems

Dimensions	Analysis criteria	LEED	BREAM	EDGE	TARSHEED	GREEN PYRAMID	ARZ	GREEN BLD CODES
National uptake	Level of acceptance of tool in its focus geography	Major limitation	Major limitation	Major limitation	Major limitation	Major limitation	Major limitation	Major limitation
	Trend of market uptake in last 3 years in build me countries	Major limitation	Major limitation	Major limitation	Major limitation	Major limitation	Major limitation	Major limitation
Market preparedness	Availability of certifiers	No limitation	Major limitation	Medium limitation	No limitation	Medium limitation	No limitation	Medium limitation
	Level of expertise needed to become an assessor	Major limitation	Major limitation	Major limitation	Major limitation	Medium limitation	Medium limitation	Medium limitation
Accessibility	Finanacial affordability	Major limitation	Major limitation	Medium limitation	Medium limitation	Medium limitation	Medium limitation	Medium limitation
	Complexity of certification process	Major limitation	Major limitation	No limitation	Medium limitation	No limitation	Major limitation	No limitation
Technical reliability	Transparency of calculations	Medium limitation	No limitation	Medium limitation	Medium limitation	Medium limitation	Major limitation	Major limitation
	Scheme's applicability to local conditions and practices	Major limitation	Medium limitation	No limitation	No limitation	No limitation	No limitation	No limitation
	Accuracy / robustness of results	Medium limitation	No limitation	Medium limitation	Medium limitation	Medium limitation	Medium limitation	Medium limitation
	Availability of saving target/ benchmark in energy consumption	No limitation	No limitation	No limitation	No limitation	No limitation	Major limitation	Major limitation
	Availability of baseline/base case description	Medium limitation	Medium limitation	Medium limitation	No limitation	No limitation	Major limitation	Major limitation
	Applicability range for new/existing buildings	No limitation	No limitation	No limitation	No limitation	Major limitation	Major limitation	Major limitation
	Applicability range for residential/ commercial buildings	No limitation	No limitation	No limitation	No limitation	No limitation	Major limitation	No limitation
	Driver for more ambitios performance	No limitation	No limitation	No limitation	No limitation	Medium limitation	No limitation	Major limitation
Process reliability	Verficiation step in place	No limitation	No limitation	No limitation	Major limitation	Major limitation	Major limitation	Major limitation
	Surveillance/ audit mechanism in place	No limitation	No limitation	Medium limitation	Major limitation	Medium limitation	No limitation	Not applicable
	Validity period for certificate	No limitation	No limitation	Medium limitation	Major limitation	No limitation	No limitation	Not applicable

Major limitation
Medium limitation
No limitation
Not applicable

International schemes (LEED, BREAM, EDGE)

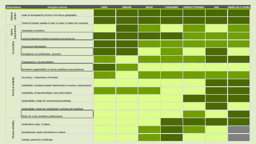
National schemes (TARSHEED, GREEN PYRAMID, ARZ, GREEN BLD CODES)

BUILD_ME classification scheme implementation concept

Institutionalize the scheme to facilitate lending for buildings EE

1 Define technical aspects

Existing schemes



Building Typology

BEP Calculation Tool

2 Tailored Scheme to banks' eligibility

Requirements of international FIs have to accept a scheme?
Energy savings

- Emission reduction
- Building types
- Public projects
- Private projects
- Occupational H&S
- Sustainable water use
- …
- …..

3 Concept for Operation and Management

Ownership and running

Operational structure of scheme

Certification and labelling process

Process of audit

Process of quality

4 Implementation in target countries

Requirements of local banks to accept scheme

Test scheme with pilot projects in each target country

Implementation scenario fit to each country condition

5 Readiness for operation in lending

Illustrative Example

Guidehouse BUILD_ME

BUILD_ME classification scheme proposed solutions

Immediate use

BEP Tool **ONLINE**

BEP Tool available online
at least until December 2026

Research
Design
Construction practice
Education

energy performance rating

Use mode 1

BEP tool available for construction sector users for design and information purposes.
This use case does not generate a certificate but provides a report of energy performance of the building and an energy performance rating

High impact – quick intervention

National Scheme BAU: **water**, **energy**, **site**

Certification

National Scheme with BEP: **water**, BEP Tool **ONLINE**, **site**

Certification PLUS

Use mode 2

National certification scheme integrates result of BEP tool in its certification process; the energy performance assessment is carried out via BEP tool. There may be several paths:

a) National certification BAU and National Certification with BEP tool runs parallel, the choice is left to the applicant depending on their needs.
b) National certification BAU used at design stage of the building, while National certification with BEP tool is used at construction stage
c) National certification with BEP tool can be used at any stage and be provided as evidence for eligible funding option.

Strategic – Long term intervention

BEP Tool ONLINE **Operator Platform**

National Scheme operator runs BEP online with increased operational control. All national market related calculation factors included in the online operator platform (OOP)

National Scheme with BEP and improved operation: **water**, BEP Tool **OOP**, **site**

Certification PRIME

Use mode 3

National certification scheme is updated in depth by making use of BEP tool, where national scheme operator can update certain default parameters themselves as needed. Additionally following areas of the scheme operation is improved:

- Control of project documentation
- Audit on site for as-built performance
- Certification validity

Guidehouse BUILD_ME

Building Energy Performance (BEP) WebApp

Overview

Performance of energy efficiency measures & RE

- Calculate **energy demand** of building
- Compare it to the **country's baseline** buildings or other personal projects
- Determine the **energy savings** of single or multiple efficiency measures and the use of renewable energies

Calculation of monetary savings

- Identify **cost savings** resulting from the energy efficiency measures and get the **cost-optimal** case
- **Local market data** is already available for Egypt, Jordan and Lebanon (investment cost, energy prices) ...
- ...or enter the real investment cost and energy prices of the specific project *(not in beta)*

Free web application

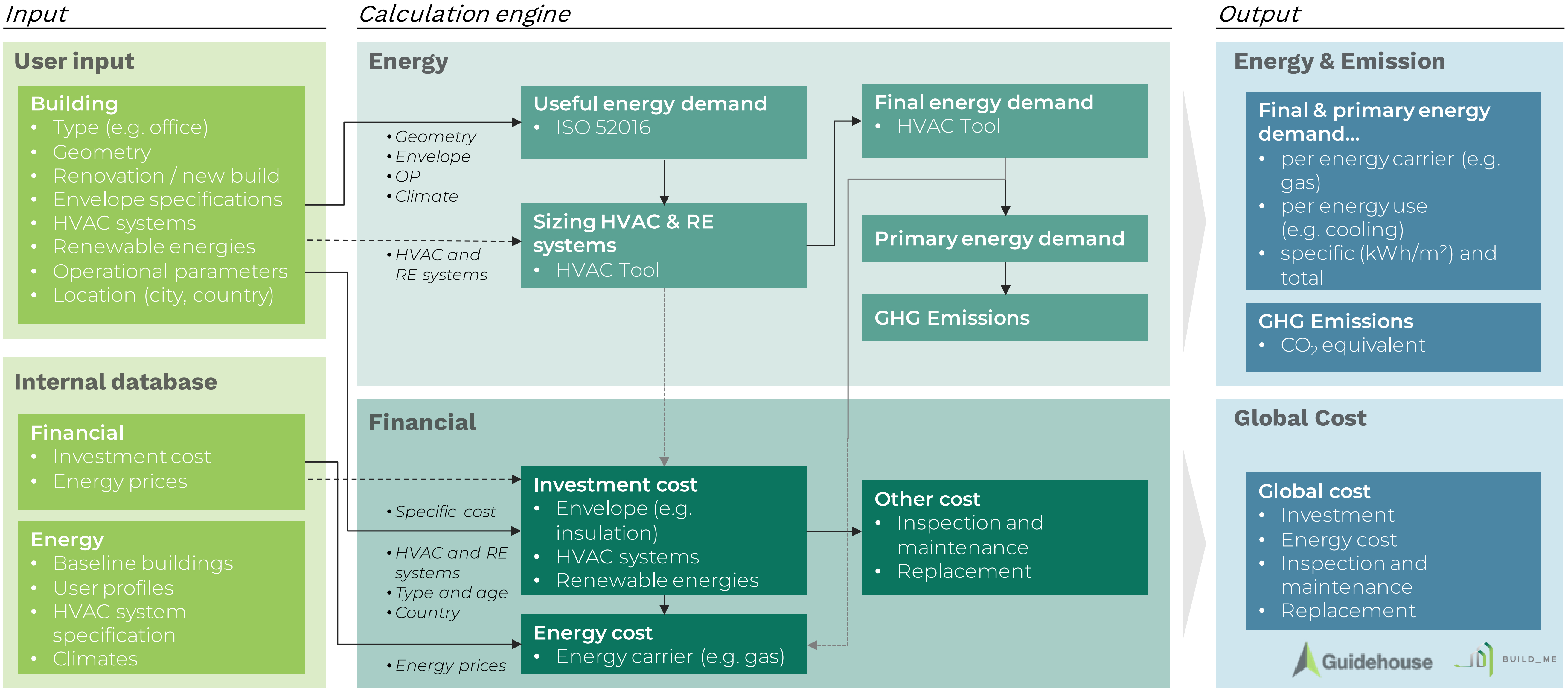
- After the launch in 2021 – the tool is **free to use as browser application**
- Optimized for **mobile devices**
- Provides **default input values** for faster application, but also **advanced mode** for experienced user
- *Currently: only selected beta-tester have access*

Proven methodology

- Energy calculation is based on the **international norm** for modelling thermal building performance (EN ISO 52016)
- The BEP-Tool was already **successfully applied** in various projects and countries
- **Full transparency** with a detailed user manual, incl. all calculation steps and internal assumptions.

Icons by Eucalyp from www.flaticon.com

Calculation methodology



Developed for the MENA region

Database from local partners & international calculation methodology

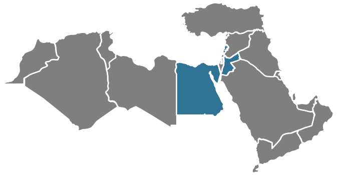
Baseline buildings

Local investment cost & energy prices

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

International calculation methodology: ISO 52016

Focus is on the countries: **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

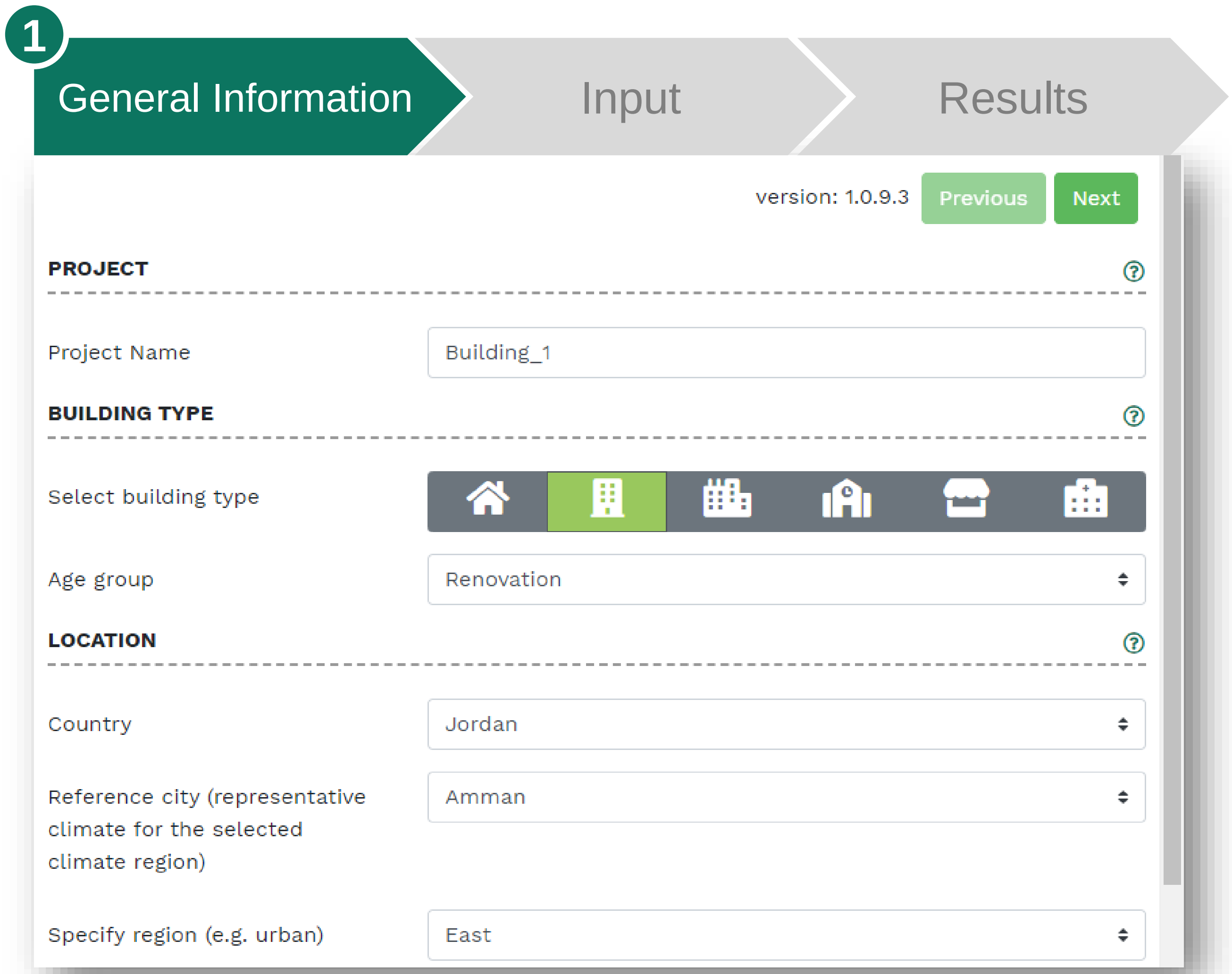
The calculation standard is internationally acknowledged.

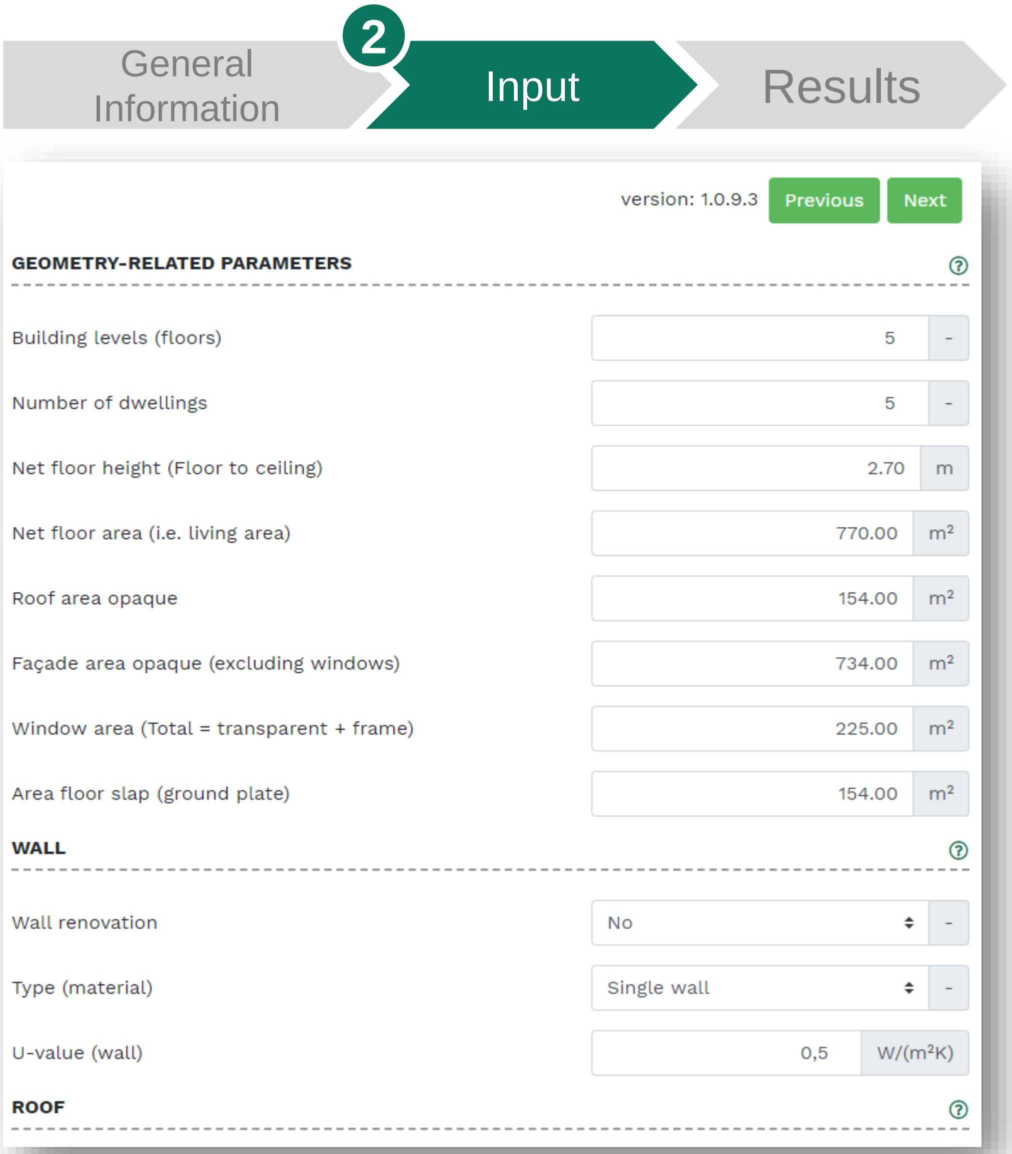
Internal market data is **collected from local partners** for Egypt, Jordan and Lebanon.

International energy calculation methodology.

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

Online Web App - Input





Online Web App – Results

3

General Information | Input | Results

Home | Tools | Knowledge base | News | About

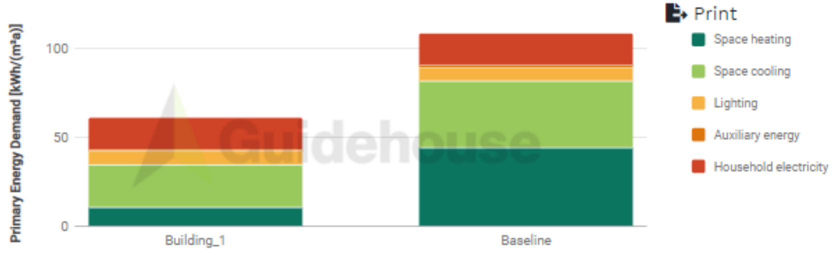
version: 1.0.9.3 Previous Next

Heating: 10.56 kWh/(m²a) | Cooling: 13.37 kWh/(m²a) | Other: 14.91 kWh/(m²a) | Σ 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%

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Online Web App – Results detail

1| Quick overview

The main facts.

7| Performance rating

C = equal to baseline

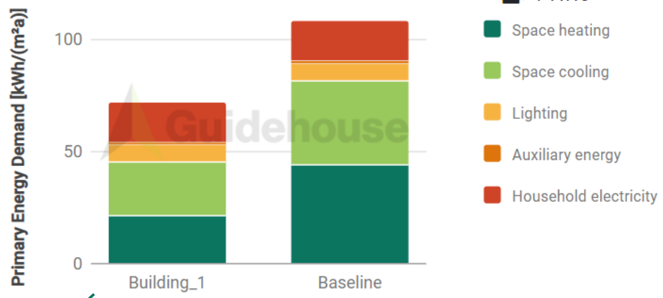
Heating: 21.41 kWh/(m²a) | Cooling: 13.36 kWh/(m²a) | Other: 10.34 kWh/(m²a) | Σ Total: 45.11 kWh/(m²a)

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	21.41	44.09	-51%
Space cooling	23.96	37.50	-36%
Lighting	7.86	7.86	0%
Auxiliary energy	0.80	1.00	-20%
Household electricity	18.19	18.19	0%
Total	72.22	108.64	-34%
Total incl. PV	63.93	108.64	-41%

2| Output selection

4 tabs to select the energy performance indicator.

6| Comparison

Difference to the baseline buildings.

3| Overview chart

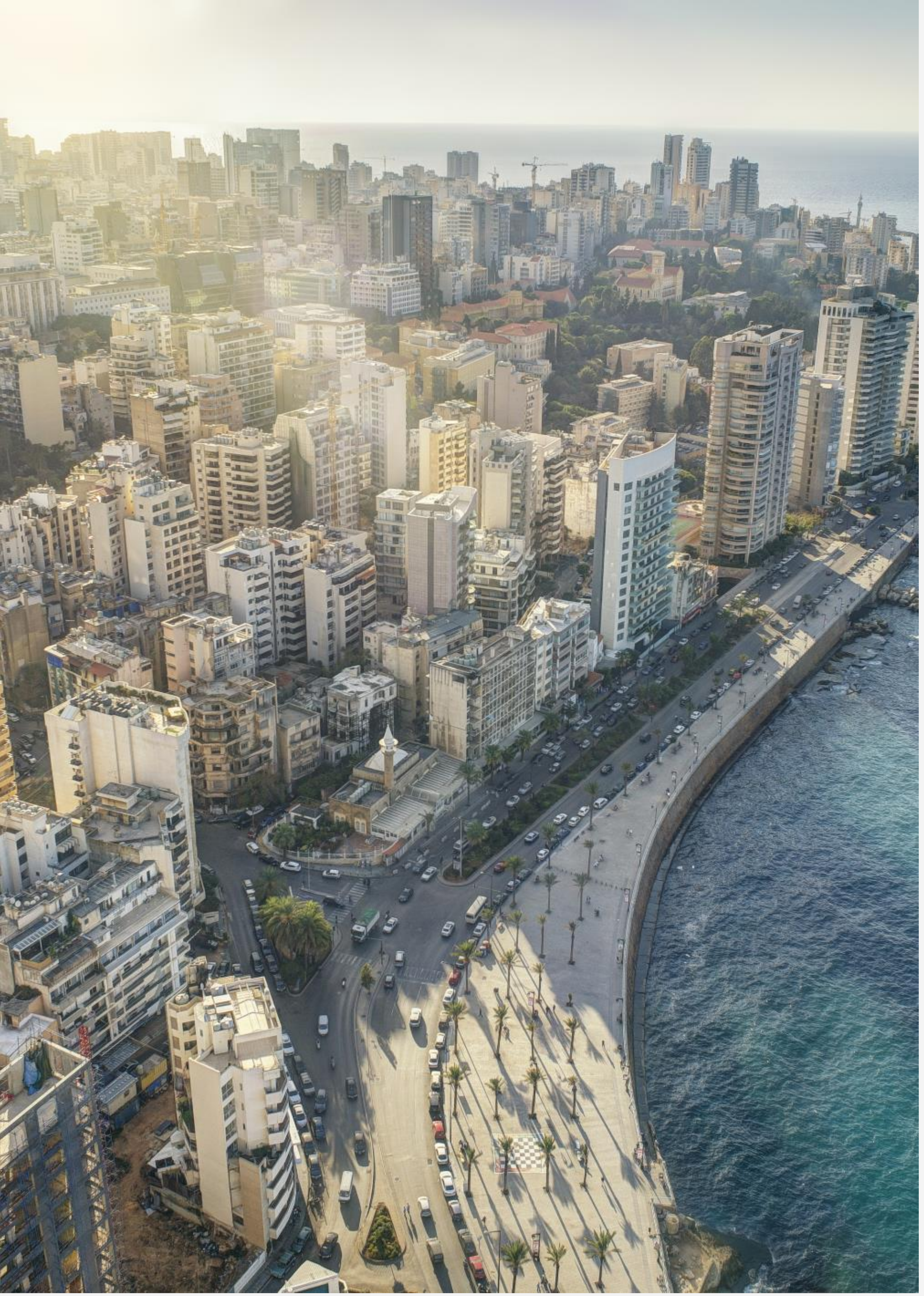
Comparison to the baseline building.

4| Results table

Detailed results in numbers.

5| Baseline building

Detailed results of the baseline building.



Agenda

Overview of the BUILD_ME project

Challenges and needs for financing energy efficiency building projects in the region

Tools to mobilise financing and accelerate energy efficiency

On the ground in Jordan: Konn Homes

Q&A

Outlook

On the ground in Jordan: Konn Homes

Husni Abzakh, Konn Technologies

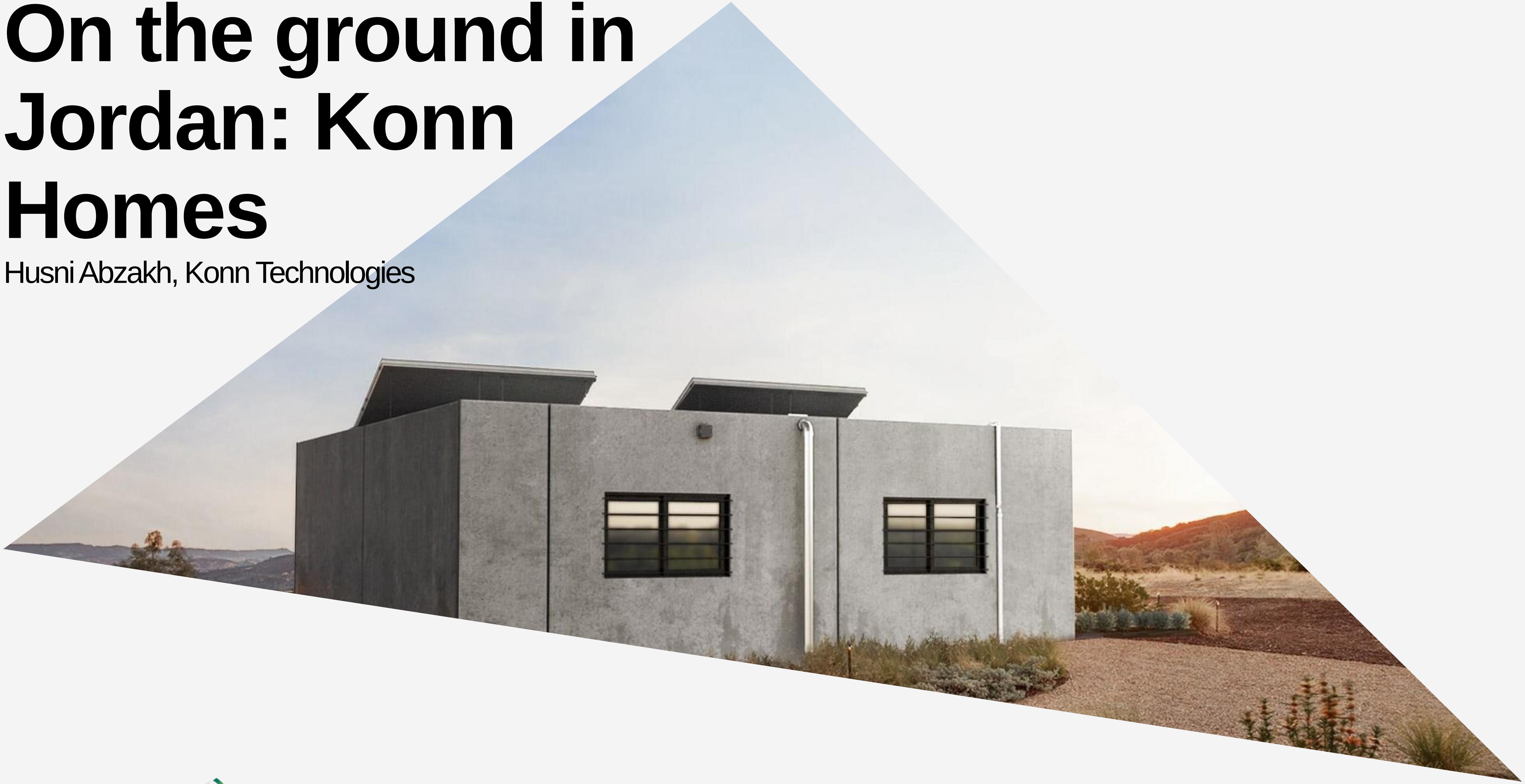


Photo by Konn Technologies

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كن
KONN

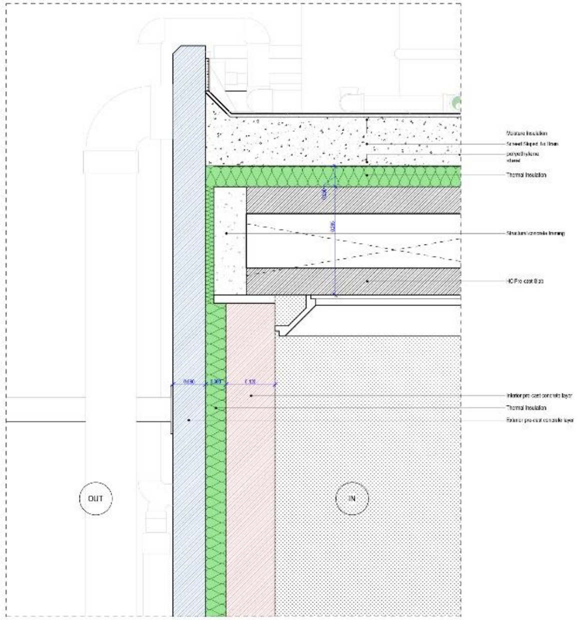
Konn Homes is a construction technology company that provides advanced, tech-enabled solutions for the construction of sustainable and affordable homes.

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.

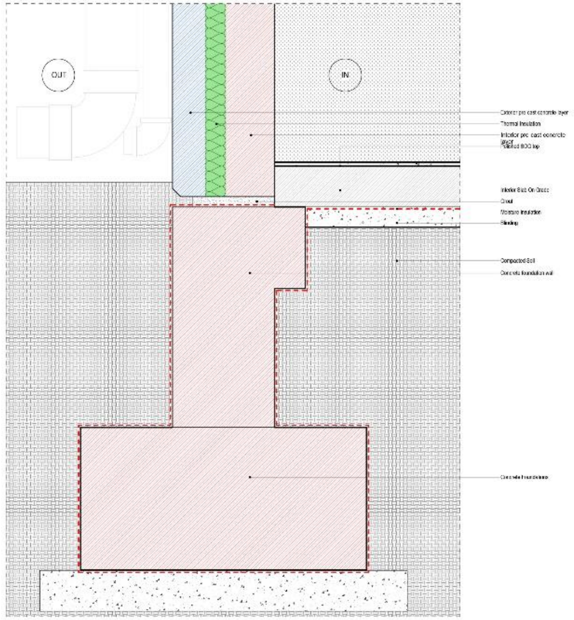
Konn homes are designed for the lifestyle and needs of the residents of Jordan and the MENA region, and built with the highest performing materials and techniques for the local climate and environment.

Building Envelope

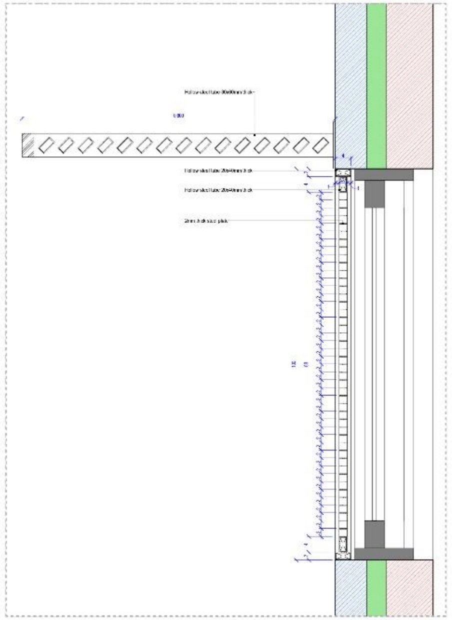
Building Element	Description	U-Value (Prototype)	U-Value (Iteration)
Exterior Walls	Precast concrete sandwich panels with XPS thermal insulation boards	0.57 W/m²K.	0.44 W/m²K.
Roof	Prestressed Hollow-core slab panels topped with XPS thermal insulation boards, 100mm sloped screed and Polyurethane damp 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.



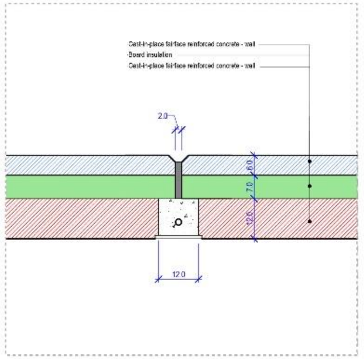
Wall/Roof Slab connection



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

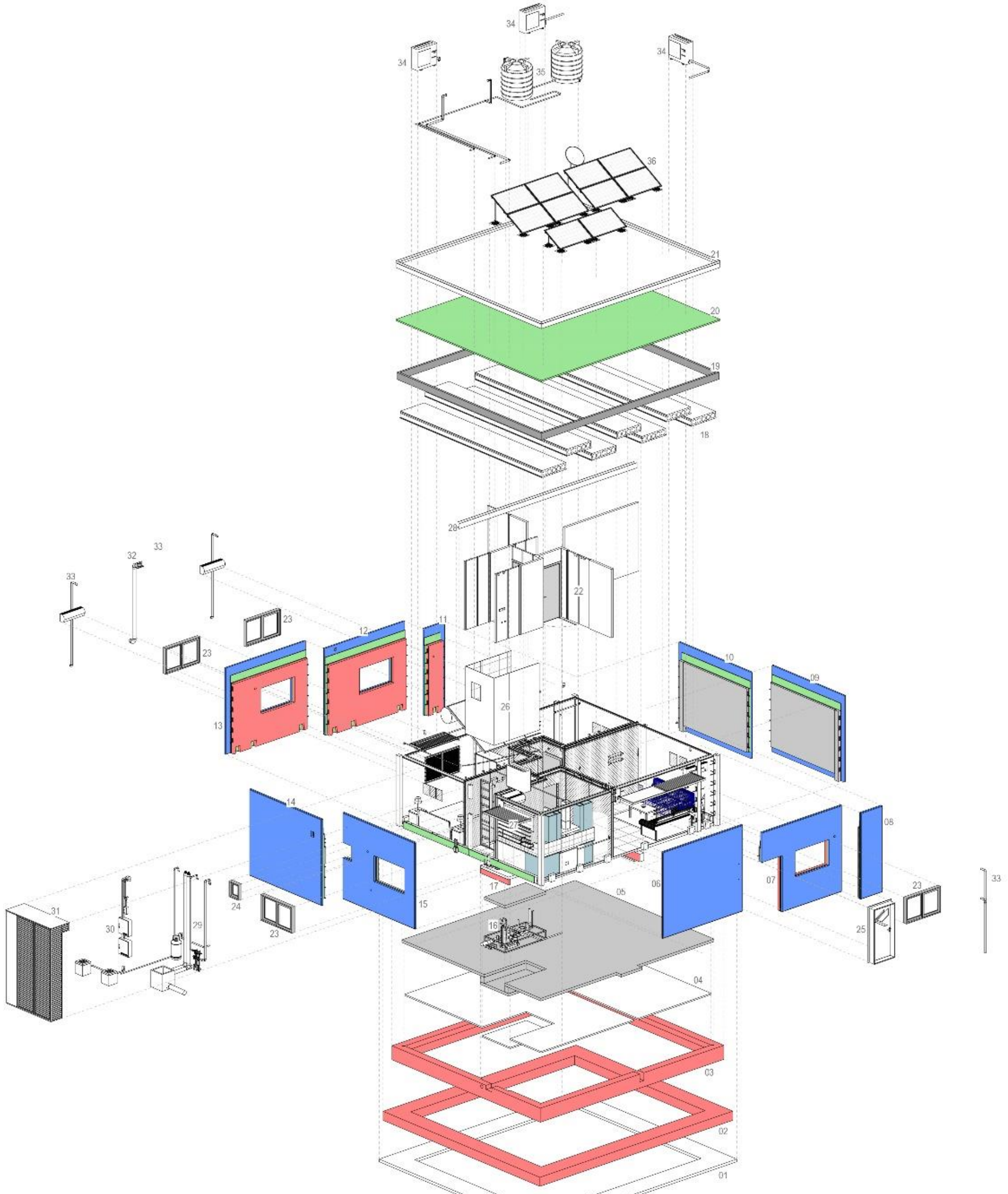
Lighting
LED (natural light) integrated energy-saving lighting fixtures

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



Financing

Challenges facing financing homes as energy efficient projects:

Market Acceptance

Prevailing market sentiment
Familiarity with established practices
Perceived resale value

Initial Construction Costs vs. Traditional Construction

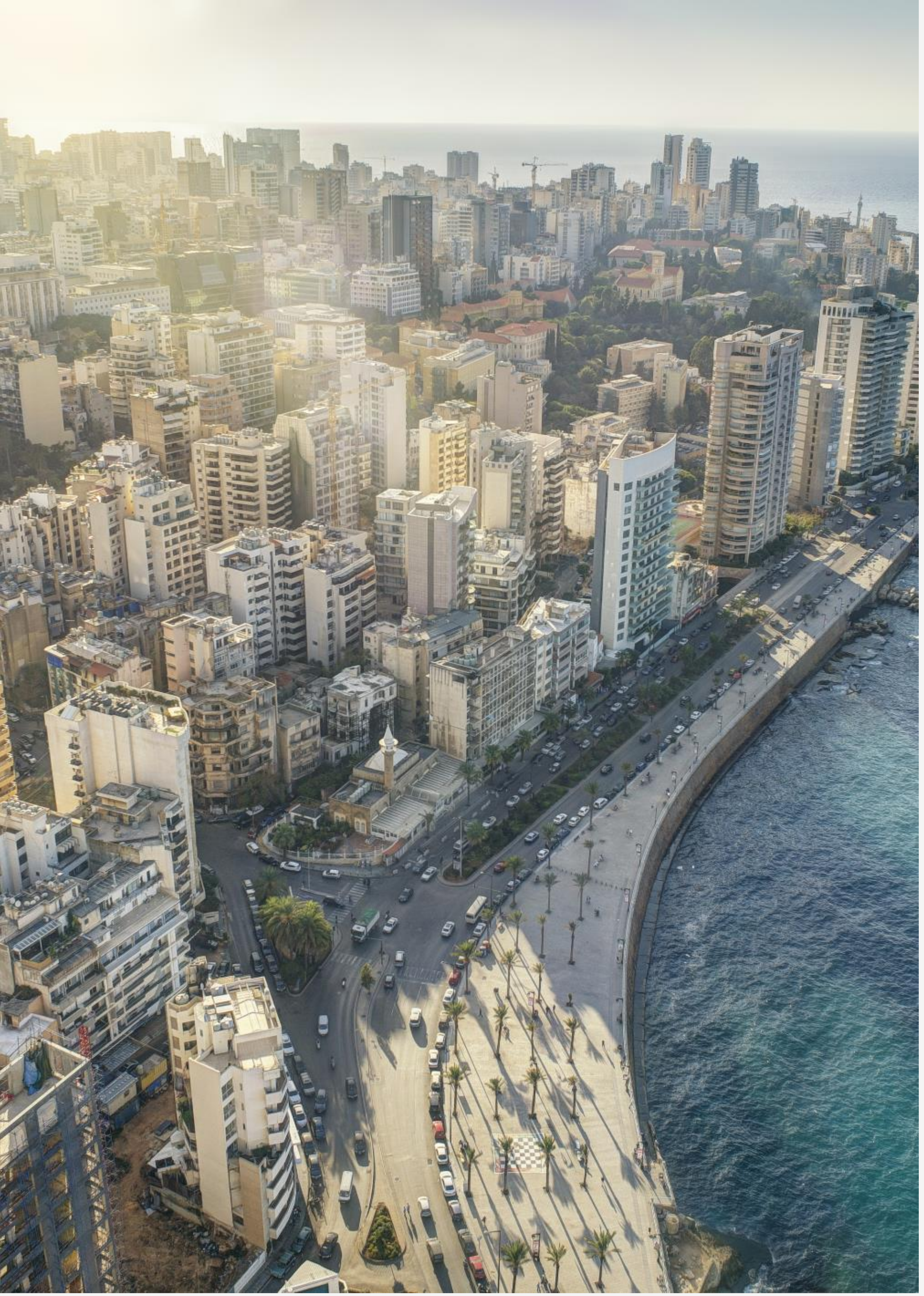
Willingness for long-term investment in EE
Low-specifications building costs
Awareness of building impact

Available financing programs

Common financing methods
Inaccurate budget allocation
Dependency on compound loans

Institutional incentives for small projects

Accessible incentives for home owners
Awareness of available programs



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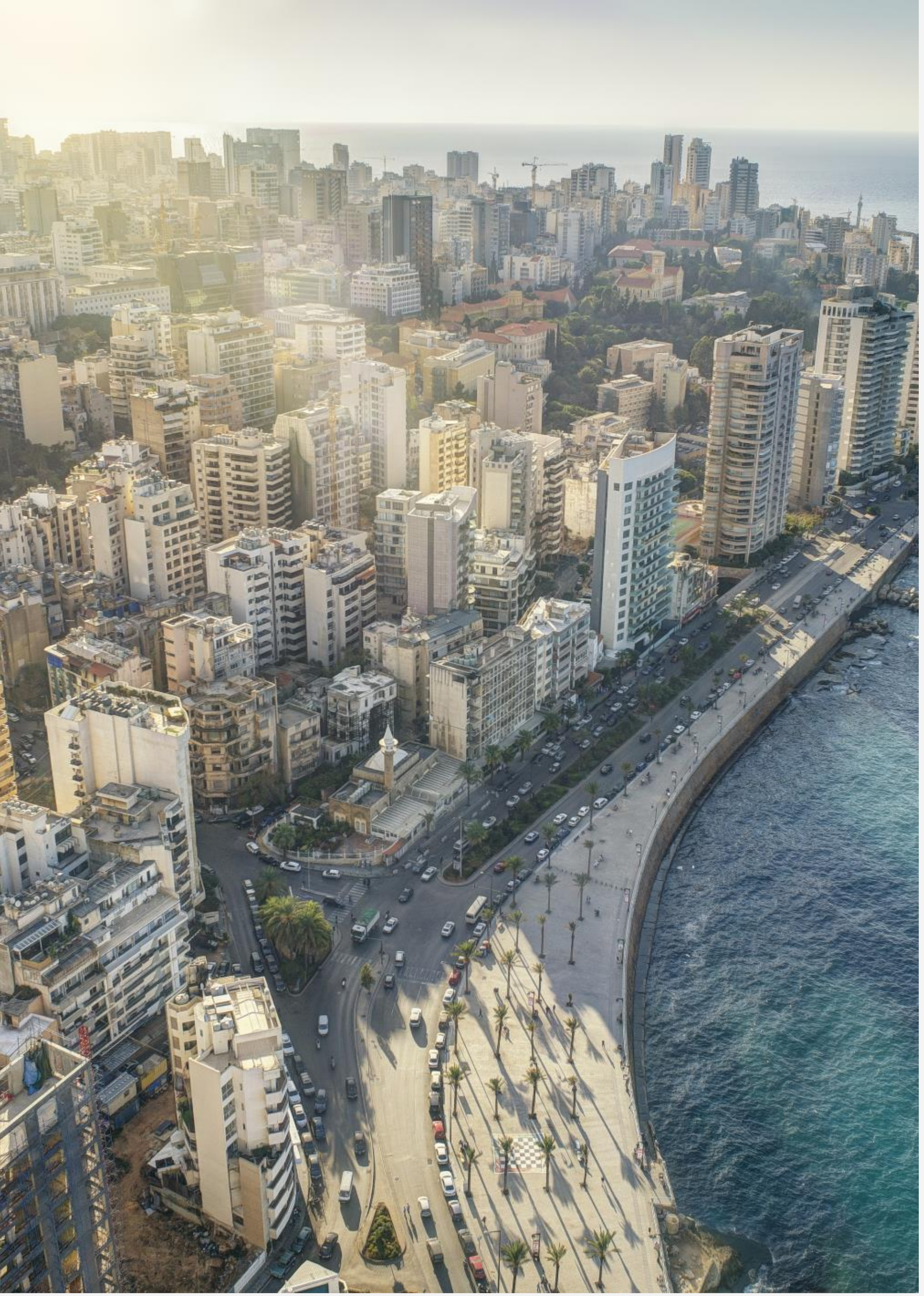

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Photo by Martin Adams on Unsplash

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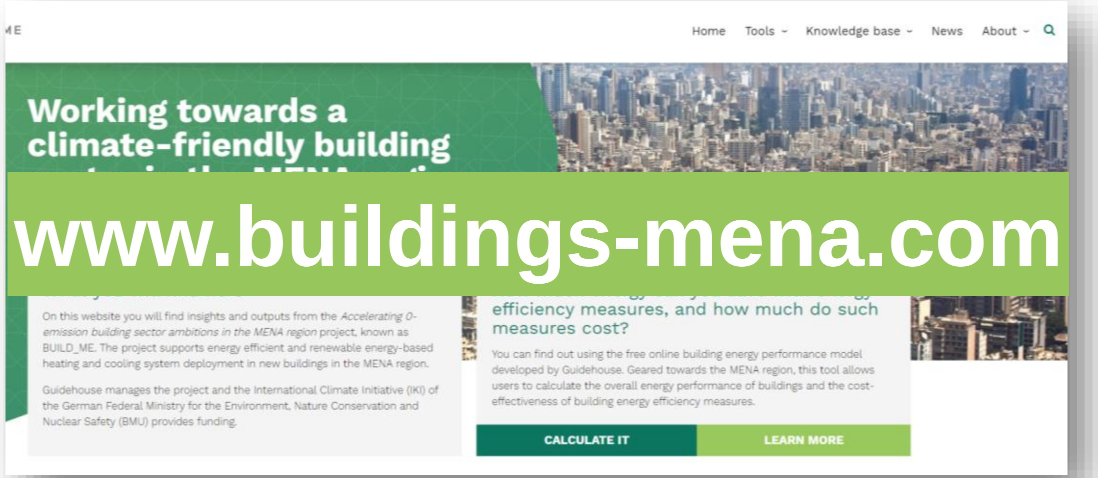
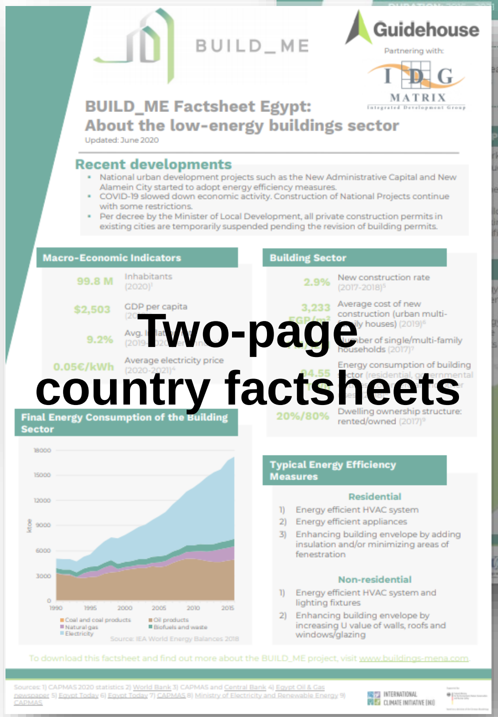
Online resources

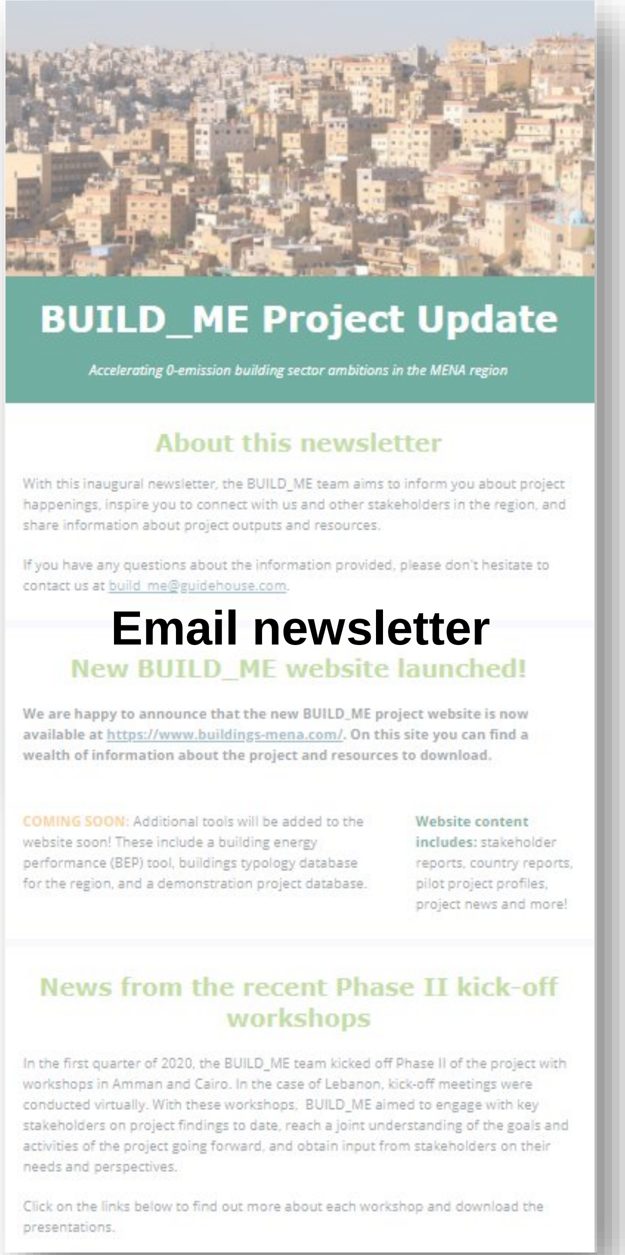


www.buildings-mena.com

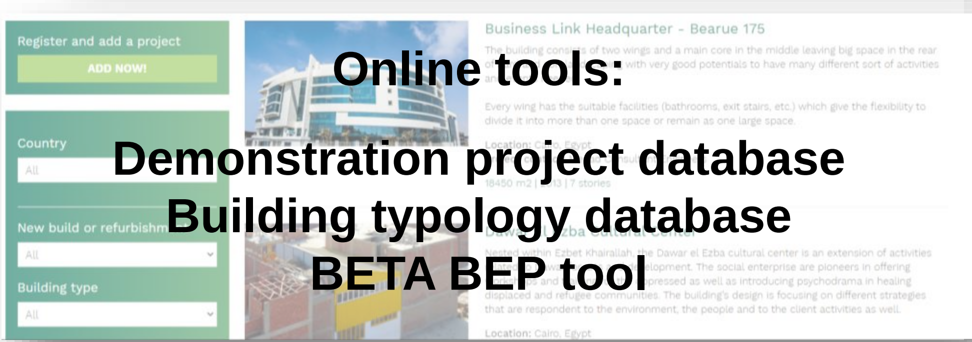
One-pager



Two-page country factsheets



Email newsletter



Online tools:

Demonstration project database
Building typology database
BETA BEP tool

News items:

Event at COP25

National workshops in Q1

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

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

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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.

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INTERNATIONAL CLIMATE INITIATIVE (IKI)

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