

PROGRAMME FOR ENERGY EFFICIENCY IN BUILDINGS

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PEEB
PROGRAMME FOR
ENERGY EFFICIENCY
IN BUILDINGS

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c/o Agence Française de Développement (AFD)
5 Rue Roland-Barthes
75012 Paris, France

E info@peeb.build
T +33 (0) 1 53 44 35 28
I www.peeb.build

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Author

PEEB Secretariat

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THE BUILDING SECTOR IS THE SLEEPING GIANT IN THE FIGHT AGAINST CLIMATE CHANGE

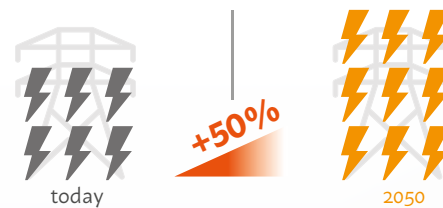
In the building sector, all trends are pointing upwards, with dramatic consequences for the climate. The construction and operation of buildings is already responsible for 39 percent of all energy-related carbon dioxide emissions. The sector also consumes 36 percent of global final energy.

4.5 trillion USD¹ are invested in real estate every year. Today's investment decisions will have an impact over the next 30 to 80 years. Better design can reduce energy consumption and carbon dioxide emissions throughout the long lifespan of a building. The potential to reduce the energy consumption of the building sector is massive, but not yet realised.

Immediate action on buildings and construction is needed to reach the goals of the Paris Agreement and fight climate change.



Global building floor area



Energy demand from the building sector



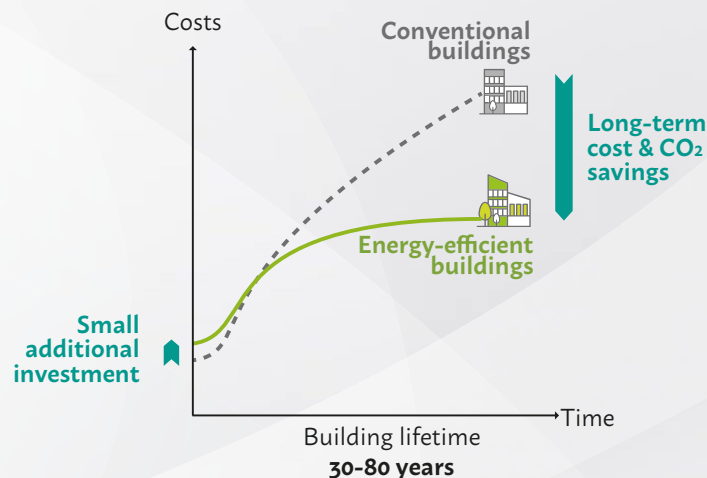
Energy needs for space cooling

Quellen: zu 1 & 2) GlobalABC (2016); Global Roadmap; zu 3) OECD and IEA (2018); The Future of Cooling; zu 4) UN Environment and IEA (2017); Global Status Report 2017.

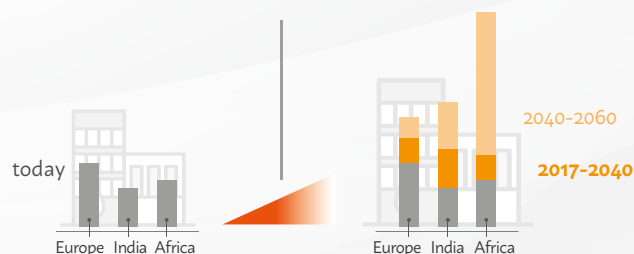
SHIFTING INVESTMENTS TOWARDS GREEN BUILDINGS

Energy efficient buildings are not rocket science. Improvements in the building envelope and appliances can achieve energy savings of 35% to 80% compared to standard buildings.² Green buildings³ also bring significant benefits from a macro-economic as well as a business perspective⁴. The International Energy Agency estimates that realising sustainable buildings will save USD 1.1 trillion by 2050⁵.

This transition requires shifts in investment. To shift 4.5 trillion USD invested in buildings each year towards energy efficiency, two factors are essential: Ambitious policies and financing.



Small additional investments can bring 35% to 80% cost savings (IPCC 2014)



Emerging and developing economies will experience **the biggest growth in building floor area.**

- 1 GlobalABC, 2019 Global Status Report.
- 2 IPCC 2014, Buildings. In: Climate Change 2014: Mitigation of Climate Change.
- 3 Green buildings encompass energy efficiency measures as well as other environmental measures such as water efficiency and mobility solutions.
- 4 PEEB 2019, Business Models for Green Buildings. Data from World Green Building Trends 2018.
- 5 IEA 2019, Perspectives for the Clean Energy Transition: The critical role of buildings.

INTERNATIONAL CLIMATE ACTION FOR THE BUILDING SECTOR

Climate action in the new decade must focus on buildings. A rapid decarbonisation needs to happen in the building sector, driven by public and private actors at the national and international level.

At the climate summit COP21 in Paris in 2015, action on buildings got new momentum. The Global Alliance for Buildings and Construction (GlobalABC) was launched. GlobalABC works towards a zero-emission, efficient and resilient buildings and construction sector. 24 countries and 72 non-state organizations joined the initiative.

To bring this vision to life, GlobalABC members France and Germany initiated the Programme for Energy Efficiency in Buildings (PEEB).

'The building sector is crucial to meet the goals of the Paris Agreement. PEEB supports ambitious countries to move towards green buildings.'



Vera Rodenhoff

German Federal Ministry for the Environment (BMU) / Chair of PEEB Programme Orientation Committee

'PEEB combines the best of our organisations: financing expertise for large-scale projects, and technical advice and capacity-building.'



Mathilde Bord-Laurans

Agence Française de Développement (AFD) / Chair of PEEB Steering Committee

2015

COP21 Paris,
launch of the GlobalABC

2018

PEEB starts
operations

2020

first NDC revision



The Secretaries of State Brune Poirson and Rita Schwarzelühr-Sutter of the initiating countries France and Germany welcome PEEB country representatives at the climate change conference COP24.

PEEB is working with its first five partner countries, Mexico, Morocco, Senegal, Tunisia and Vietnam. More countries are interested in joining the programme.

PEEB combines the expertise of its implementing agencies Agence Française de Développement (AFD), Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ), and Agence de l'Environnement et de la Maîtrise de l'Energie (ADEME).

NDCs (Nationally Determined Contributions) – more ambition is needed to decarbonise the building sector

NDCs for the building sector are crucial to mobilise action. However, the GlobalABC's 2019 Global Status Report shows that most NDCs on buildings do not have specific targets or policy actions. The revision of NDCs is an opportunity to raise the ambition, make targets actionable and mobilise support towards a decarbonisation of the sector.

2030

30% reduction of energy use per square meter⁵
GlobalABC

2050

Decarbonisation of the building sector

PEEB SERVICES

PEEB combines **financing for energy efficiency in large-scale projects** with **technical assistance through policy advice**. Expertise and capacity-building for sector professionals is promoted as a cross-cutting topic.

FINANCE

PEEB mobilises innovative financing solutions for large building projects.

- Feasibility studies and support with project development
- Funding for energy efficient construction and renovation projects
- Mobilising innovative climate financing from international and national resources



POLICY

PEEB supports partner countries to improve policies and standards.

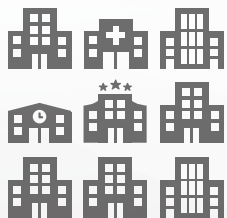
- Regulations and standards for green buildings
- Ambitious NDCs and implementation road maps
- MRV systems
- Inter-institutional cooperation



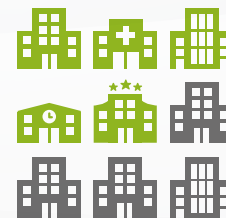
EXPERTISE

PEEB fosters expertise among professionals in the private & public sector.

- Planning of new buildings from design to construction and operation
- Sustainable building materials, digital tools, passive design, efficient appliances and sustainable energy supply
- Financing options and business models



Buildings cause 39% of all energy-related CO₂ emissions



Sustainable building sector

IMPACTS AND KEY FIGURES

FINANCE

- Financing pipeline: **EUR 600 million**
- Financing appraised for **3 projects**, feasibility studies ongoing for **6 projects**
- **Mobilisation of climate finance** for NAMA projects in Morocco and Vietnam, private sector projects in Mexico and Morocco



POLICY

- Supporting the **development of energy efficiency policies** in Morocco, Tunisia and Senegal
- Advice on **NDC roadmaps** or platforms in Mexico and Vietnam
- Support on establishment of **National Alliances for Buildings and Construction** in Morocco, Mexico, and Tunisia with GlobalABC



EXPERTISE

- **Capacity building** and **knowledge transfer** to the private and public sectors
- **Trainings on financing for green buildings** for over **500 policy makers** and practitioners in **5 countries**
- **Awareness-raising** at **17 international meetings** and co-organising **regional workshops** for Asia and North Africa in cooperation with the GlobalABC







PEEB ACTIVITIES

MEXICO



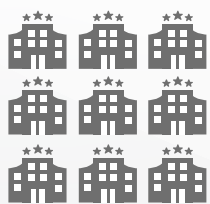
KEY FACTS

- Building growth: 15 million new housing units are needed by 2030
- Schools, hotels, commercial buildings and hospitals are also expected to grow fast
- NDC: 22% reduction of GHG emissions in 2030 below business-as-usual and 36% with international support
- USD 25 billion were invested in Mexican real estate market in 2017.



The Mexican government targets residential and commercial buildings in its NDC to reduce emissions through improved building regulations. Private firms need more capacity and incentives.

PEEB supports this through active engagement with the private sector, including investors, developers and financiers, as well as public institutions responsible for large public works and energy efficiency standards.



Sector growth: 40 million sqm hotels to be built by 2030

Private sector trainings on financing



Technical guide for hotels



Revise plans for 20 new hotels



Advice on energy regulations for hotels



Greening the hotel sector

PEEB ACTIVITIES IN MEXICO

- Advice to the Ministry of Environment (SEMARNAT) on incorporating ambitious energy performance standards into the existing building regulation for hotels
- Technical guide on energy efficiency in hotels
- 20 new hotels of the Mexican hotel chain Grupo Misión receive support on energy efficiency concepts
- Tenders for school and hospital projects integrate energy efficiency by advising the Ministry of Finance on financing criteria.
- Private sector mobilisation through recommendations on financial incentives and trainings on financing

PEEB SUCCESS STORY | ENERGY EFFICIENT HOTELS - LOW-COST MEASURES WITH GREAT IMPACT

Hotels are large consumers of energy and the tourism sector is continually growing. By 2030, an additional 40 million m² of hotels will have been built. After awareness-raising by PEEB, Mexican hotel groups are eager to make their hotels energy efficient. The Mexican hotel chain Grupo Misión plans to build 20 new energy-efficient hotels which are estimated to save around 124 ktCO₂ over a 30 years lifespan.

PEEB analysed hotel prototypes for three different climate zones in Mexico: dry, humid and temperate. Modifying prototypes leads to energy savings in a large number of building projects. Potential improvements range from 'no cost' measures like changing the orientation, to measures that would cost under EUR 100.000 per hotel.

This includes low emissivity glass or solar control properties, rooftops with thermal insulation, more efficient air conditioners and water heaters as well as solar powered water heating.

Savings potential from no cost to under EUR 100.000:

- Dry: 17% to 30%
- Humid: 25% to 37%
- Temperate: 20% to 34%



'PEEB has helped us innovate our energy saving goals so as to offer higher value to our investors and clients.'

Alejandro Fis,

Director of Expansion and Development,
Hotel Group Grupo Misión, Mexico, 2019

MOROCCO



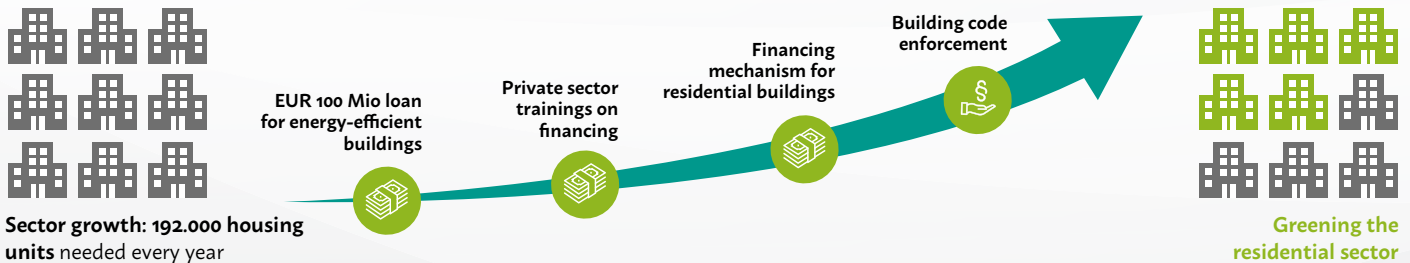
KEY FACTS

- 50% of all investments in Morocco are in real estate property
- 192,000 new housing units are needed every year until 2030
- The NDC stipulates a 42% reduction of greenhouse gas emissions below business-as-usual by 2030
- Energy demand needs to be reduced by 19% in the residential and 13% in the service sector by 2030.



Morocco has a comprehensive building energy efficiency code. Compliance is essential. PEEB therefore focuses on better enforcement as well as financial incentive mechanisms.

In addition, PEEB supports the agile private sector in the development of energy efficient building projects and trainings.





PEEB ACTIVITIES IN MOROCCO

- Enforcement of the building code through support for the Ministry of Housing and training of 100 government officials
- Strengthening of the Moroccan Alliance for Buildings and Climate (AMBC)
- Mobilisation of the private sector through trainings on financing and technical advice
- Development of a national financing mechanism for residential buildings through technical studies
- Development of a EUR 20 million NAMA support project

Financing: EUR 100 million loan to public housing developer, Al Omrane, for energy efficient buildings and appliances.

PEEB SUCCESS STORY | CLIMATE FINANCING FOR ENERGY EFFICIENCY IN LOW- AND MIDDLE-INCOME HOUSEHOLDS

Morocco's residential sector is growing. Low- and middle-income households often cannot afford the higher upfront cost of energy efficient buildings and appliances. The Government of Morocco is therefore setting up a financing mechanism.

PEEB worked with the Government of Morocco to apply for EUR 20 million of climate financing from the NAMA Facility. AFD will provide an additional EUR 100 million loan to the developer. The Ministry of National Territory Planning, Urban Planning, Housing and City Policy, the Ministry of Energy, Mining and Environment, and the public housing developer, Al Omrane, are the central stakeholders in this project. The preliminary proposal was accepted, and a final decision is expected in early 2021.

A financing mechanism will provide support for energy efficient buildings via Al Omrane, and support highly efficient appliances via retailers. Approximately 160kt CO₂ will be mitigated over the five-year duration of the programme and 955kt CO₂ over the lifespan of buildings and appliances.



'The project is particularly important for promoting energy efficiency in the residential sector in Morocco. It stimulates the market to accelerate the application of energy efficiency measures in buildings.'

Mrs. Nouzha BOUCHARB

Minister of National Territory Planning, Urban Planning, Housing and City Policy

SENEGAL

KEY FACTS

- Dakar's population is expected to increase from 3.5 million inhabitants today to 5 million by 2030
- 322,000 new housing units are needed, about half of them in Dakar
- Ambitious new building projects are ongoing, including a new urban centre in Diamniadio and the project to build 100,000 new homes by 2024.



Senegal has an active building sector and intends to become a pioneer for sustainable building materials. PEEB supports the Senegalese government in developing a regulation for new buildings and distributes knowledge about financing energy efficiency in the private sector.

The ministries of Health and Education benefit from financial support and capacity-building to save energy and use sustainable building materials in schools, hospitals and administrative buildings.



Population expected to double by 2050



Greening the education sector



PEEB ACTIVITIES IN SENEGAL

- Roadmap to develop thermal regulation through technical support
- Technical support and trainings for ministry staff in charge of construction
- Energy efficient health centres and schools through revisions of standard plans
- Trainings on financing energy efficiency measures for private sector

Financing: three rural health centres; schools and legal buildings under discussion

PEEB SUCCESS STORY

ENERGY EFFICIENCY IN THE HEALTH SECTOR

Senegal has a large programme for construction in the health sector. Most rural health centres serve at least 100,000 people. Air conditioning, equipment for sterilisation, radiology and washing are the biggest drivers of electricity consumption in these facilities. Power cuts in rural areas lead to a high use of diesel generators.

PEEB finances the integration of energy efficiency in three rural health centres. PEEB experts train ministry staff on energy efficiency at the planning stage. They also suggest improvements to standard plans and planning documents. Low and medium cost measures like roof insulation, protection against direct sunlight through shading, integrating solar PV or solar water heaters and using local materials will save energy.

Passive building design combined with ceiling fans can reduce the periods of discomfort throughout the day from 85% to 5%. They lead to cost savings of EUR 20,000 per year for every health centre and improve work and health conditions for staff and patients. This will also improve work and health conditions for staff and patients.



'In the health sector, we often don't look beyond functional and aesthetic aspects. We need to integrate energy efficiency into our practices.'

Ibra Aly Sy, Project Coordinator,
Ministry of Health

TUNISIA



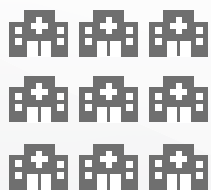
KEY FACTS

- The building sector is expected to grow by 25% in the next 15 years
- The NDC stipulates a reduction in carbon intensity by 41% by 2030
- Individual households' investment in housing made up 18% of total capital investment in Tunisia in 2016.



Tunisia's regulative framework is well developed and incentive mechanisms promote energy efficiency. The application of codes is essential. PEEB therefore focuses on compliance with regulation both for project developers and for public authorities.

To reach the ambitious NDC targets, the residential and public sectors need to become energy-efficient. Several health facilities are being constructed or renewed. PEEB supports construction projects in the health sector as well as a social housing project.



Construction and rehabilitation of hospitals

EUR 158 Mio financing for two hospitals



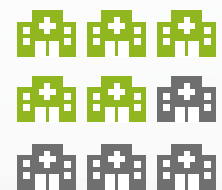
Guide for hospitals



Trainings for energy efficiency managers



Green building code for hospitals



Greening the health sector



PEEB ACTIVITIES IN TUNISIA

- Enforcement of building codes through trainings for municipal employees and a legal review of enforcement mechanisms
- Guide for health facilities and raising awareness within the Ministry of Health
- Mapping of current and future building stock and energy demand to demonstrate the need for action
- Training of policy makers, architects and engineers on financing
- Assistance to the Ministry of Housing in identifying an appropriate large scale, energy-efficient social housing project.

Financing: EUR 158 Mio for the construction of two upgraded, energy efficient regional hospitals.

PEEB SUCCESS STORY

HOSPITALS - SCALE EFFECTS FOR SECTOR TRANSFORMATION

Tunisia improves access to regional health facilities by extending existing facilities as well as constructing new ones. Two large regional hospitals will incorporate extensive energy efficiency measures with PEEB support. Both hospitals will outperform the planned energy regulations for hospital buildings by 20%. The required financing of EUR 156 million will come from AFD, with an additional EUR 2 million from the European Union.

PEEB will support the Ministry of Health for the duration of the construction process to ensure achievement of the high energy performance standard. A technical guide on energy efficiency in health facilities will be used to transfer this knowledge to other hospital projects.

More than a dozen large regional hospitals are currently planned. These scale effects lead to a high leverage in energy-efficient investment and CO₂ savings.



'Our role is to convince our partners, project owners and implementing entities to adopt low-energy solutions. A PEEB study showed that simple and locally implementable solutions can achieve a 50% improvement in energy performance.'

Camille-Nicolas Perreand,
AFD Health Division Task Team Leader

VIETNAM



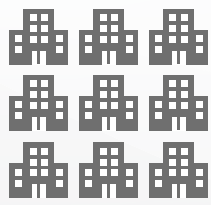
KEY FACTS

- 374,000 new housing units needed in cities each year until 2040
- NDC: 8% reduction in greenhouse gas emissions below business-as-usual by 2030, 25% with international support
- Real estate is one of the largest sectors of the Vietnamese economy, with USD 11 billion in 2019



The Vietnamese government aims to promote green housing, commercial and service buildings. PEEB supports the Ministry of Construction (MOC) in developing a new national programme for affordable, low emission housing.

Vietnam also intends to strengthen its NDCs in the building sector. PEEB supports with the development of an NDC Buildings Mitigation Platform.



Sector growth: 374,000 housing units needed every year.

EUR 100 Mio for national housing programme



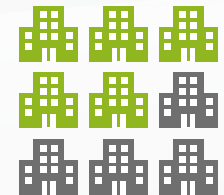
Mobilising private investments



Technical guide for green housing



NDC Buildings Roadmap



Greening the residential sector



PEEB ACTIVITIES IN VIETNAM

- Support for NDC Buildings Mitigation Platform and NDC buildings roadmap for faster NDC implementation.
- Trainings on financing for policy makers and practitioners as well as investment recommendations for green buildings
- Technical guide for green housing
- Preparation of a large-scale national programme for green housing
- Development of a proposal to the NAMA Facility for housing

Financing: EUR 100 million funding for a national program that promotes affordable, low carbon housing

PEEB SUCCESS STORY

HOUSING FUND TO PROVIDE GREEN LOANS FOR FAMILIES

A young and growing population in Vietnam means there is a huge demand for new housing, especially amongst young urban families.

The Vietnamese Ministry of Construction is preparing a new national programme for affordable, low-carbon housing for mid-income households. PEEB supports the development of the new housing programme, through analysis of appropriate financing schemes and a technical feasibility study.

The new programme will introduce basic standards for energy efficiency, including improved building design, insulation and efficient lighting.

Green credits will stimulate supply and demand:

- Private housing developers receive green credits for the construction of energy efficient housing.
- Low- and mid-income households receive green credits to cover additional costs, to incentivize purchasing or long-term leasing of affordable energy efficient housing.



'There is a great potential for green buildings in Vietnam. Businesses need to lead the way, but the awareness of buyers is just as important.'

Nguyen Tran Nam, president of the Vietnam Real Estate Association



Roundtable Morocco



Panel FIABCI event

INTERNATIONAL: RAISING AWARENESS, MOBILISING AMBITION

PEEB raises awareness on the need for action in the building sector and best practices. This is done in collaboration with partner countries and at the international level with the GlobalABC.

PEEB co-hosted two regional roundtables of the GlobalABC in Morocco and Vietnam, bringing together 150 participants from 27 countries. At the UNFCCC climate conferences, the UN Climate Action Summit and the Global Business Summit of the International Real Estate Federation FIABCI, PEEB

co-organised side events and mobilised support for initiatives. Topics ranged from NDC implementation, financing, raising ambition and monitoring. National meetings bring together business and policy for more ambition.

PEEB publications add to the global discussion and provide practical guidance. Topics include new business models, digital solutions and building design to curb the massive cooling demand. Analyses of the building sector in partner countries help decision makers spur action.



PEEB APPROACH TO ENERGY-EFFICIENT BUILDINGS

AVOID

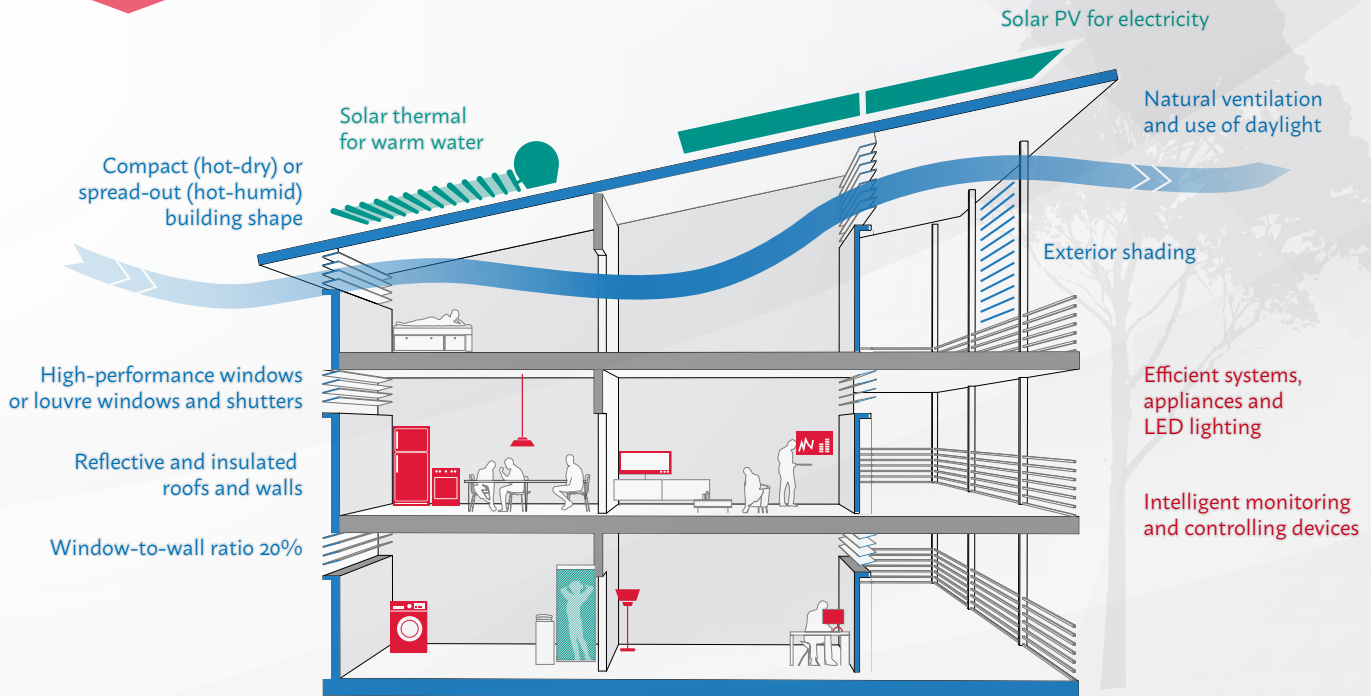
Building design adapted to the local climate to avoid high energy demand

SHIFT

Renewable energy to replace carbon-intensive energy supply

IMPROVE

Efficient systems and appliances to reduce energy consumption



Building orientation west-east



Energy efficiency measures in a building



PEEB

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5 Rue Roland-Barthes
75012 Paris, France

E info@peeb.build
T +33 (0) 1 53 44 35 28
I www.peeb.build

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