



Towards zero-emission efficient and resilient buildings

» GLOBAL STATUS REPORT 2016



Global Alliance
for Buildings and
Construction

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Global Alliance
for Buildings and
Construction

» GLOBAL ALLIANCE FOR BUILDINGS AND CONSTRUCTION WORKING GROUPS

The Global Alliance for Buildings and Construction (GABC) was launched at the 21st Conference of Parties (COP21) Buildings Day in Paris on the 3rd of December 2016. It was initiated by France and the United Nations Environment Programme (UN Environment) to bring together the building and construction industry, countries and stakeholders to raise awareness and facilitate the global transition towards for low-emission, energy-efficient buildings.

With its creation, GABC members acknowledged that the buildings and construction sector can contribute significantly to achieving climate goals and the common objective of limiting global warming to well-below 2 Celsius (2°C).

Indeed, the GABC aims at supporting and accelerating the implementation of the NDCs, and thus facilitate the implementation of the Paris Agreement for the buildings and construction sector in terms of energy efficiency gains, growth of renewable energy and GHG emissions reduction. Moreover, the GABC aims at dramatically reducing the GHG emissions of the global building stock by increasing the share of eco-friendly buildings, whether new or renovated.

Today, the GABC gathers together 23 countries and 64 non-state organisations (sub-national, non-governmental organisations and private sector) from all over the world and is intended to increase the pace and scale of actions through communication, collaboration and implementation.

GABC activities are organized around different working groups contributing to the transition towards low-GHG and resilient real estate: Education and Awareness; Public Policies; Market Transformation; Finance; and Measurements, Indicators and Accountability. These working groups have been established during the inaugural meeting and seminar of the GABC, held in Paris on the 18th and 19th of April 2016.

During the inaugural meeting in Paris, GABC members agreed on the need for two ad-hoc frameworks: a Global Roadmap for the transition towards low-emission and resilient real estate and this Global Status Report, along with a Building and Climate Yearbook that will be produced on an annual basis hereafter.

This is the first draft of the Global Status Report, which will track each year the progress made in the transition towards low-emission and resilient real estate. The next complete edition will be issued on November 2017.

The GABC Secretariat is hosted by the UN Environment, Economy Division in Paris and served by the GABC Coordinator. Contribution of new data and information to enrich this document are welcome.

For more information, please contact the following email address: globalstatusreport@globalabc.org.

» GLOBAL PERSPECTIVE

Energy use in **buildings and for building construction** represents more than one-third of global final energy consumption and contributes to nearly one-quarter of greenhouse gases (GHG) emissions worldwide ¹.

A growing population, as well as rapid growth in purchasing power in emerging economies and developing countries, means that energy demand in buildings could increase by 50% by 2050 ², while global building floor area is expected to double by 2050, driving energy demand and related GHG emissions for construction.

¹ This data covers more than building-related energy. This concept will be further explained in the GABC Roadmap.

² IEA (2016), Energy Technology Perspectives 2016, IEA/OECD, Paris.



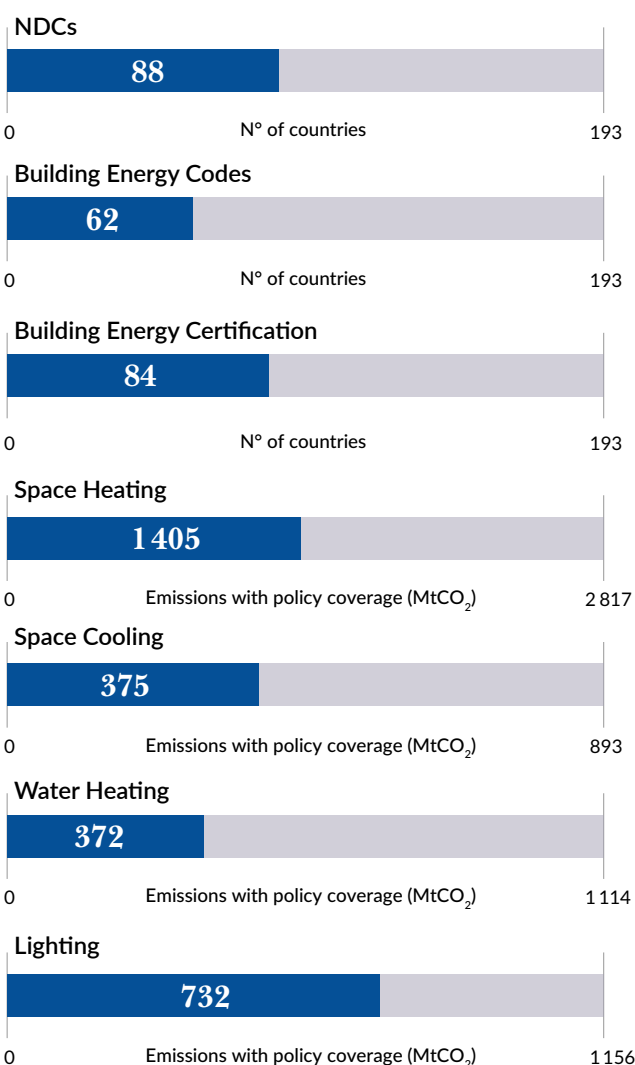
Table Building floor area growth to 2050 by region³

Billion m2	2015	2030	2050
North America	38.1	47.1	56.9
Western Europe	29.8	34.3	36.9
Eurasia	9.8	13.1	14.9
China	57.2	79.3	84.6
India	15.8	32.1	57.6
Japan and Korea	9.8	10.9	11.1
Southeast Asia	15.6	23.8	32.3
Australia and New Zealand	2.1	2.7	3.4
Latin America and Caribbean	19.3	29.1	43.1
Middle East	8.0	12.7	18.3
Africa	18.0	30.4	56.0
World	223.4	31.54	415.2

Yet, the building sector offers the largest cost-effective GHG mitigation potential, with net cost savings and economic gains possible through implementation of existing technologies, policies and building designs⁴.

Building energy efficiency technologies and policies have been demonstrated as cost effective means for collectively improving energy security and productivity, while also improving health and wellbeing, reducing local air pollution, creating jobs and adapting to climate change. Governments are looking increasingly at ways to accelerate investment in net-zero/low-carbon buildings, and the essential role of the building sector is well recognised as a critical element to achieving the Paris Agreement's goal of limiting global warming to well-below 2°C.

Nearly 90 countries have now included building sector actions in their Nationally Determined Contributions (NDCs), and a coalition of over 90 states and non-state actors has formed the Global Alliance for Buildings and Construction to raise awareness of the building sector's huge climate action potential and focus specifically on engaging relevant stakeholders to help achieve a well-below 2°C pathway.



³ IEA (2016), *Energy Technology Perspectives 2016*, IEA/OECD, Paris.

⁴ Intergovernmental Panel on climate Change (IPCC) (2014), *Climate Change 2014: Mitigation of Climate Change*, 5th Assessment Report, WG III.

In addition, more than 3 000 city-level and 500 private sector commitments and actions in the building sector have been registered under the United Nations Framework Convention on Climate Change. The finance sector is also mobilising investors, representing over USD 3 000 billion in assets to increase financing for energy-efficient buildings. A number of industry and professional bodies are also mobilising their networks of company and professional members to support market development for high-performance buildings, including initiatives to implement net-zero/carbon-neutral building certification programmes, platforms for private sector engagement with cities to develop and implement local decarbonisation action plans, and communication and education campaigns on net-zero buildings and deep renovation of existing buildings⁵.

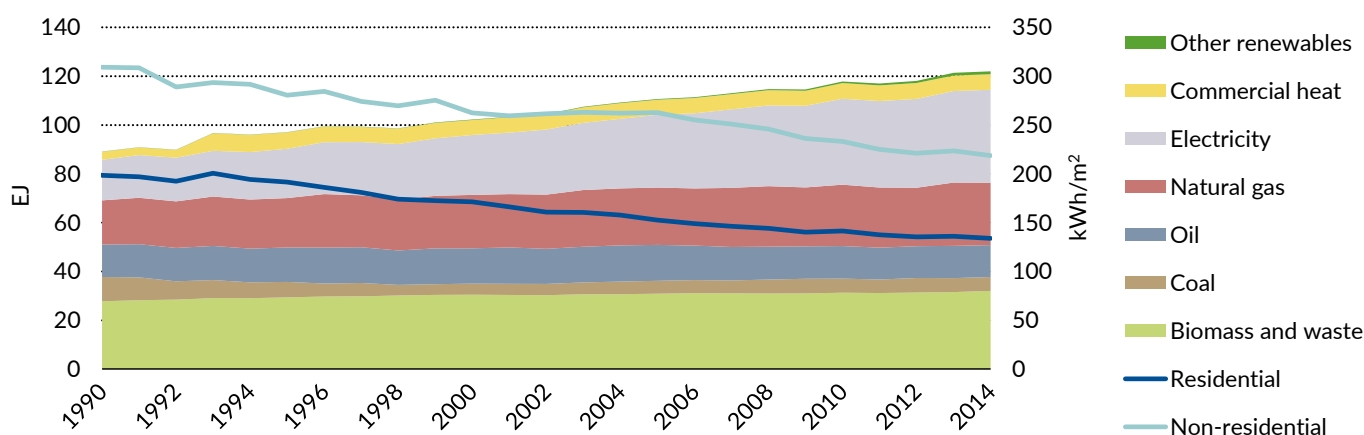
Despite this surge of awareness and commitment across stakeholders, the energy savings and GHG mitigation targets being set for the building sector are not yet

ambitious enough to achieve the Paris Agreement's pledges. A below 2°C pathway requires reducing global energy and process-based carbon dioxide (CO₂) emissions by 60% in 2050 compared to 2012⁶.

For the building sector, this means avoiding at least 50% of projected growth in energy consumption through mainstreaming of highly energy-efficient, near-zero, net-zero energy and energy-plus buildings in new construction as well as massive uptake of deep renovation of the existing building stock by 2030⁷.

Ensuring this transformation requires investing around an additional USD 220 billion annually by 2020 – an almost 50% increase on 2014 investments in energy-efficient buildings⁸. This does not necessarily require new funding, but rather a reallocation of less than 3% of the current total global annual investment in construction activity (roughly USD 8.5 trillion in 2014)⁹. Returns on this investment could be more than 100%¹⁰ if investments in ambitious policy and technology actions are made

Figure 2 Global building sector energy consumption and intensity by sub-sector, 1990-2014



Note: Building sector energy consumption and intensities represent final energy consumption; EJ = exajoules; kWh/m² = kilowatt-hour per square metre.

Source: International Energy Agency (IEA), calculations derived from IEA World Energy Statistics and Balances 2016, www.iea.org/statistics.

Key point

Building energy intensities have improved since 1990, but not enough to offset strong growth in building floor area. As a result, global building energy consumption and related GHG emissions continue to rise.

⁵ For a list of GABC member initiatives, see: <http://web.unep.org/climatechange/buildingsday/take-action>.

⁶ IEA (2015), Energy Efficiency Market Report 2015, IEA/OECD, Paris

⁷ Ibid.

⁸ IEA (2015), Energy Efficiency Market Report 2015, IEA/OECD, Paris

⁹ Construction Intelligence Center (2014), Global Construction Outlook 2020, Timetric, April.

¹⁰ Diana Urge-Vorsatz, Andras Reith, Katarína Korytárová, Mynika Egyed, János Dollenstein (2015), Monetary Benefits of Ambitious Building Energy Policies, research report prepared by Advanced Building and Urban Design (ABUD) for the Global Building Performance Network (GBPN), January.

now, and possibly even higher when accounting for the potential multiple benefits, such as improved health and wellbeing¹¹. Alternatively, if business-as-usual or even only moderate performance improvements in new and existing buildings continue to be implemented, there may never be a positive return on investment, and even a possible loss of about 6% by 2050¹².

Priorities for Action

The most efficient and low-carbon building and construction markets have often taken decades to develop. However, a global transformation to a highly energy-efficient, low-carbon building sector must occur over the next decade to ensure a well-below 2°C ambition. This is especially true in emerging economies, where there is a critical window of opportunity to address the largest new construction markets to avoid locking in inefficient buildings for decades.

**50%
or more**

Building sector energy savings potential in 2050 in support of a below 2°C pathway.



There are many strategies for reducing the climate related impact of buildings and construction. Key priorities identified in the draft GABC roadmap include:

1

Urban planning policies for energy efficiency

Use urban planning policies to impact the form and compactness of buildings to enable reduced energy demand and increased renewable energy capacity.

2

Improve the performance of existing buildings

Increase the energy efficiency renovation rate and increase the level of energy efficiency in existing buildings.

3

Achieve net-zero operating emissions

Increase the uptake of building or system level net-zero operating emissions for new buildings.

4

Improve energy management of all buildings

Reduce the operating energy and emissions through improved energy management tools and operational capacity building.

5

Decarbonise energy

Integrate renewable energy and reduce the carbon footprint of energy demand in buildings.

6

Reduce embodied energy and emissions

Reduce the environmental impact of materials and equipment in the buildings & construction value chain by taking a life-cycle approach.

7

Reduce energy demand from appliances

Collaborate with global initiatives to reduce the energy demand from appliances, lighting and cooking.

8

Upgrade adaptation

Reduce climate-change related risks of buildings by adapting building design and improving resilience.

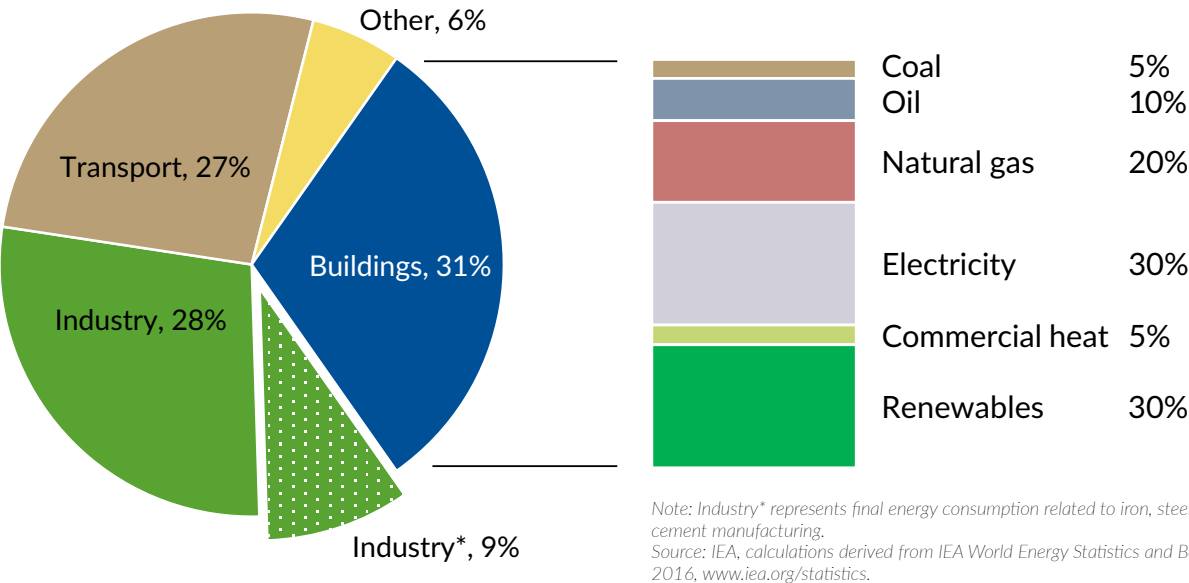
¹¹ World Green Business Council (2014), Health, Wellbeing and Productivity in Offices, www.betterplacesforpeople.org.

¹² Ibid.

» GLOBAL STATUS

The global building sector consumed nearly 122 exajoules (EJ) (equivalent to 34×10^6 gigawatt-hours [GWh]) in 2014¹³, over 30% of total final energy consumption¹⁴ for all sectors of the economy, having increased by more than 35% since 1990¹⁵. Buildings also accounted for half of global electricity demand, with electricity consumption increasing by more than 500% in some regions since 1990. When upstream power generation is taken into account, the building sector therefore represents roughly 30% of global energy-related CO₂ emissions.

Figure 3 Global final energy consumption and building energy use by fuel share, 2014



Key point

Buildings and construction account for nearly one-third of global final energy consumption.

Globally, building energy performance (as measured by If no action is taken to improve the energy performance

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