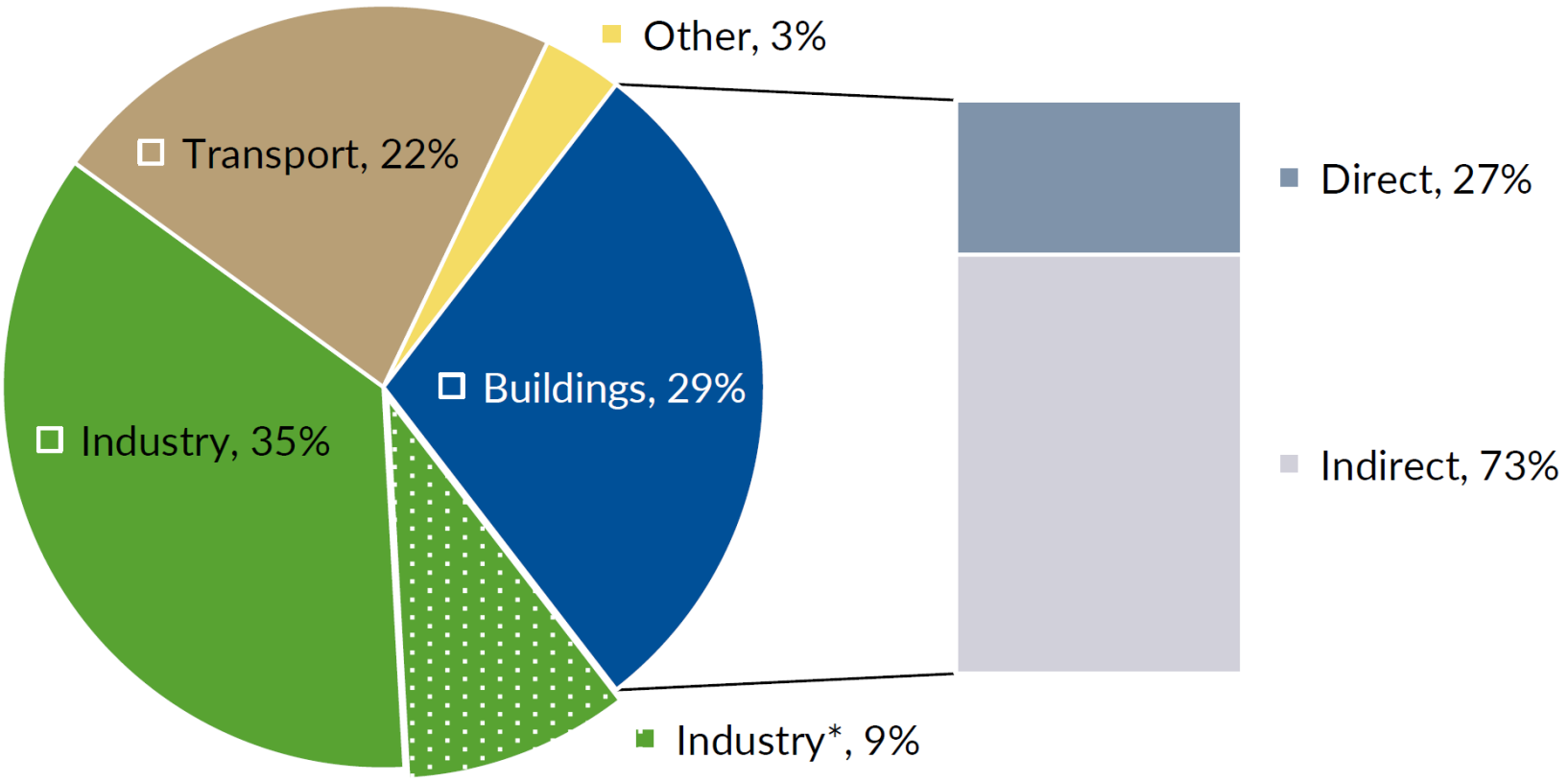
Global Alliance for Buildings and Construction

Global Status Report

for COP 22

2016

Emissions from Buildings & Construction



Buildings and construction make up nearly 40% of the global direct and indirect energy-related CO_2 emissions.

Carbon-Energy Intensity in Buildings

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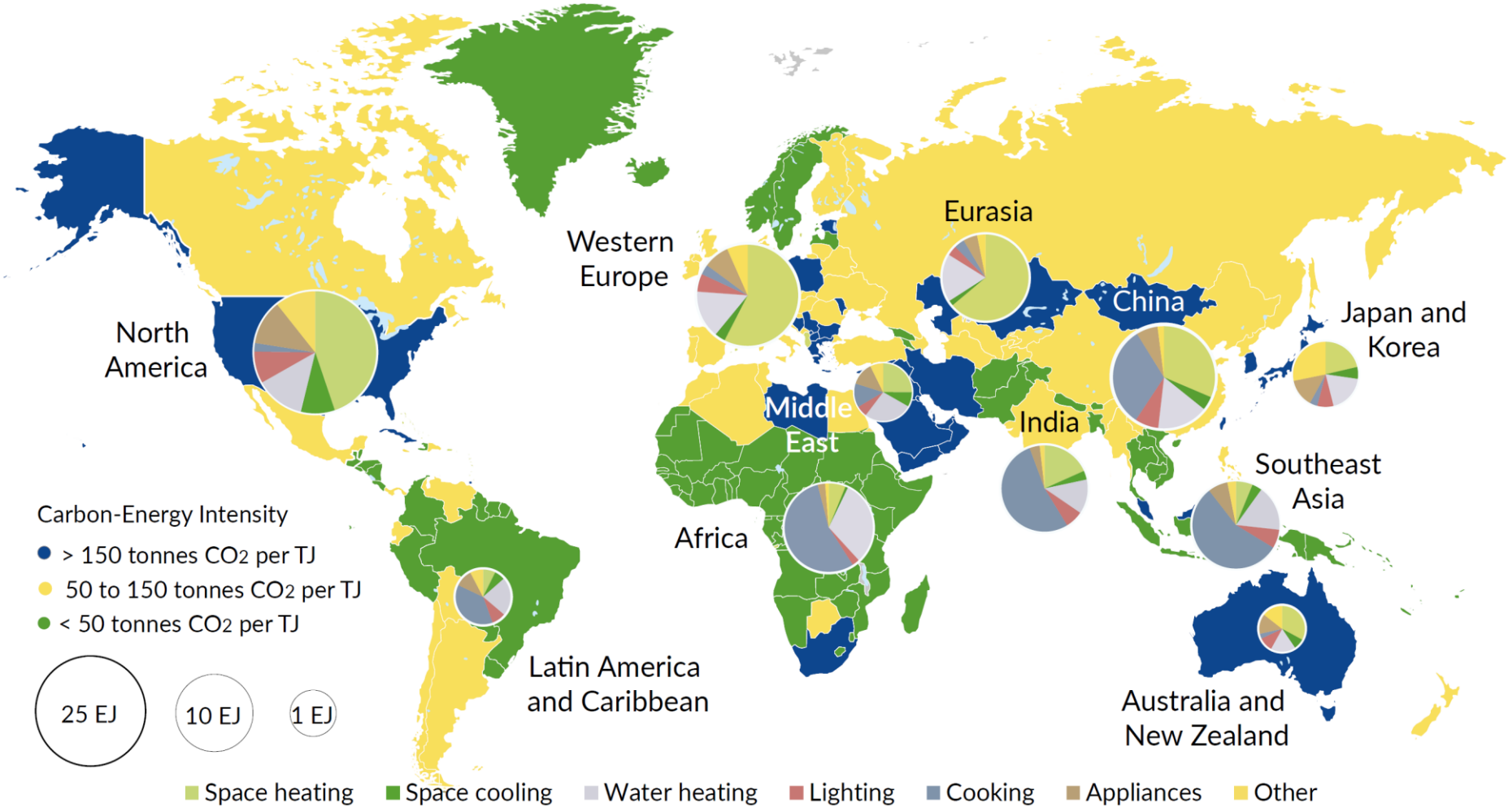
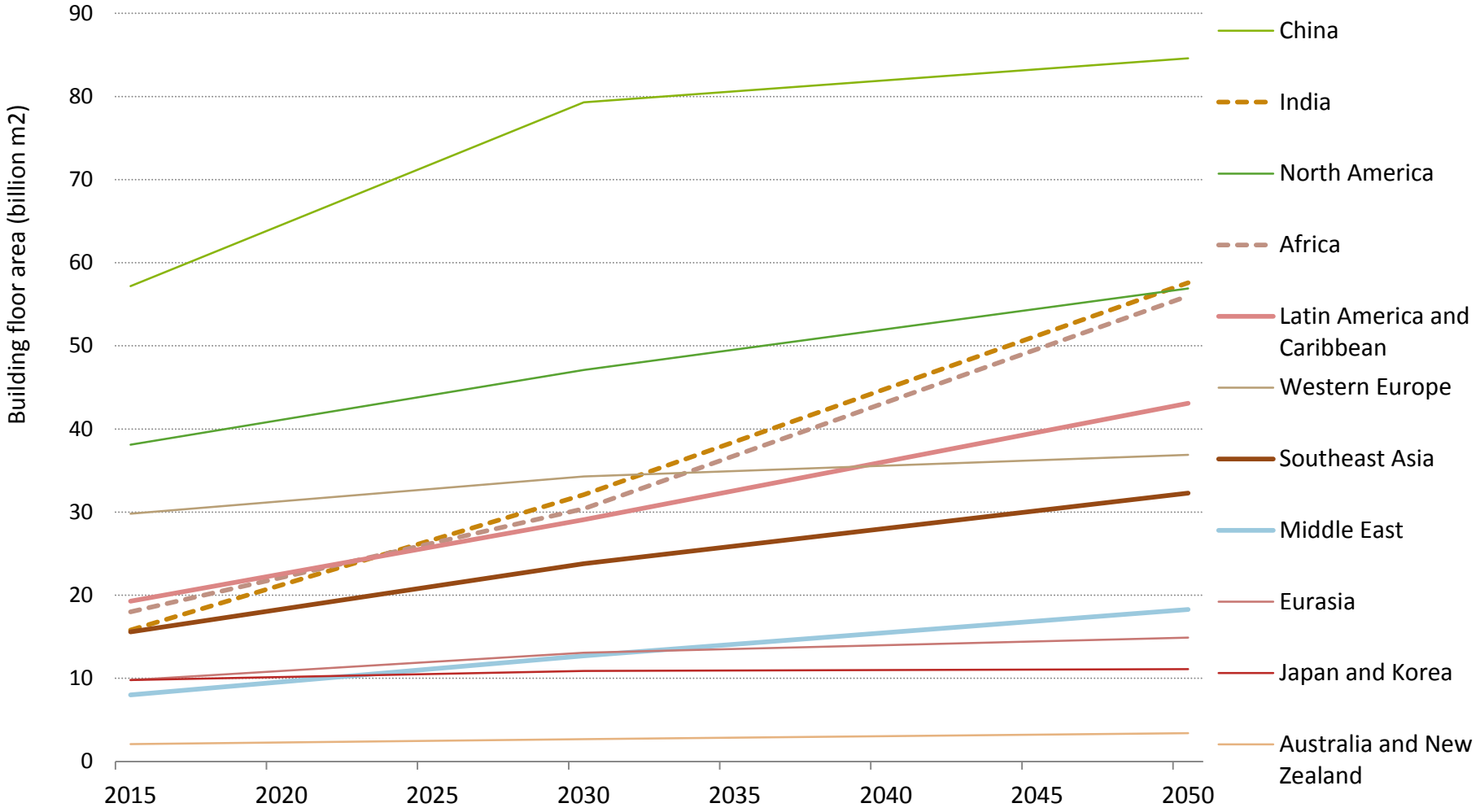


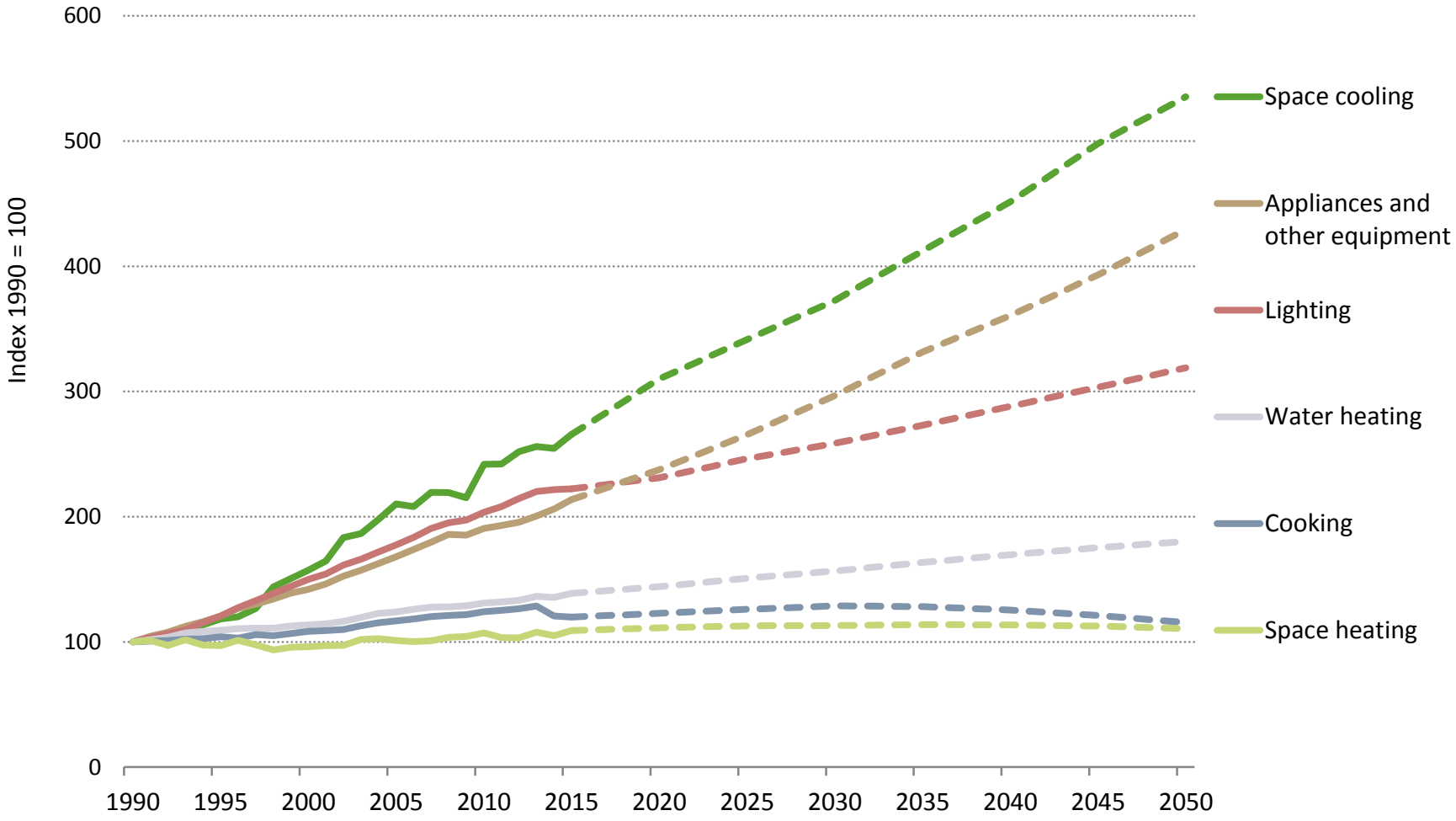
Growing demand for electricity use in buildings will put increasing onus on the power sector to reduce carbon intensity.

Floor Area Growth in Buildings



Major growth in buildings is expected in India and Africa (over 200%); and in Latin America, Southeast Asia and Middle East (over 100%).

End-use Growth in Buildings



Space cooling has been and will continue to be the fastest growing end-use to 2050.

Energy Consumption in Buildings for 2°C

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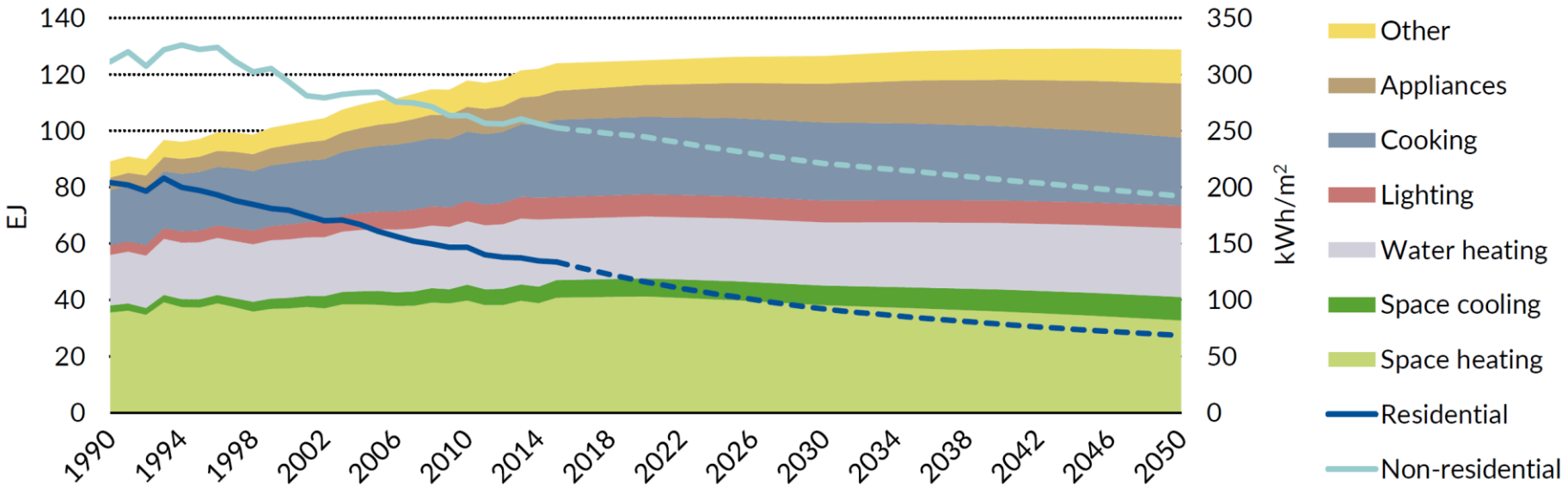
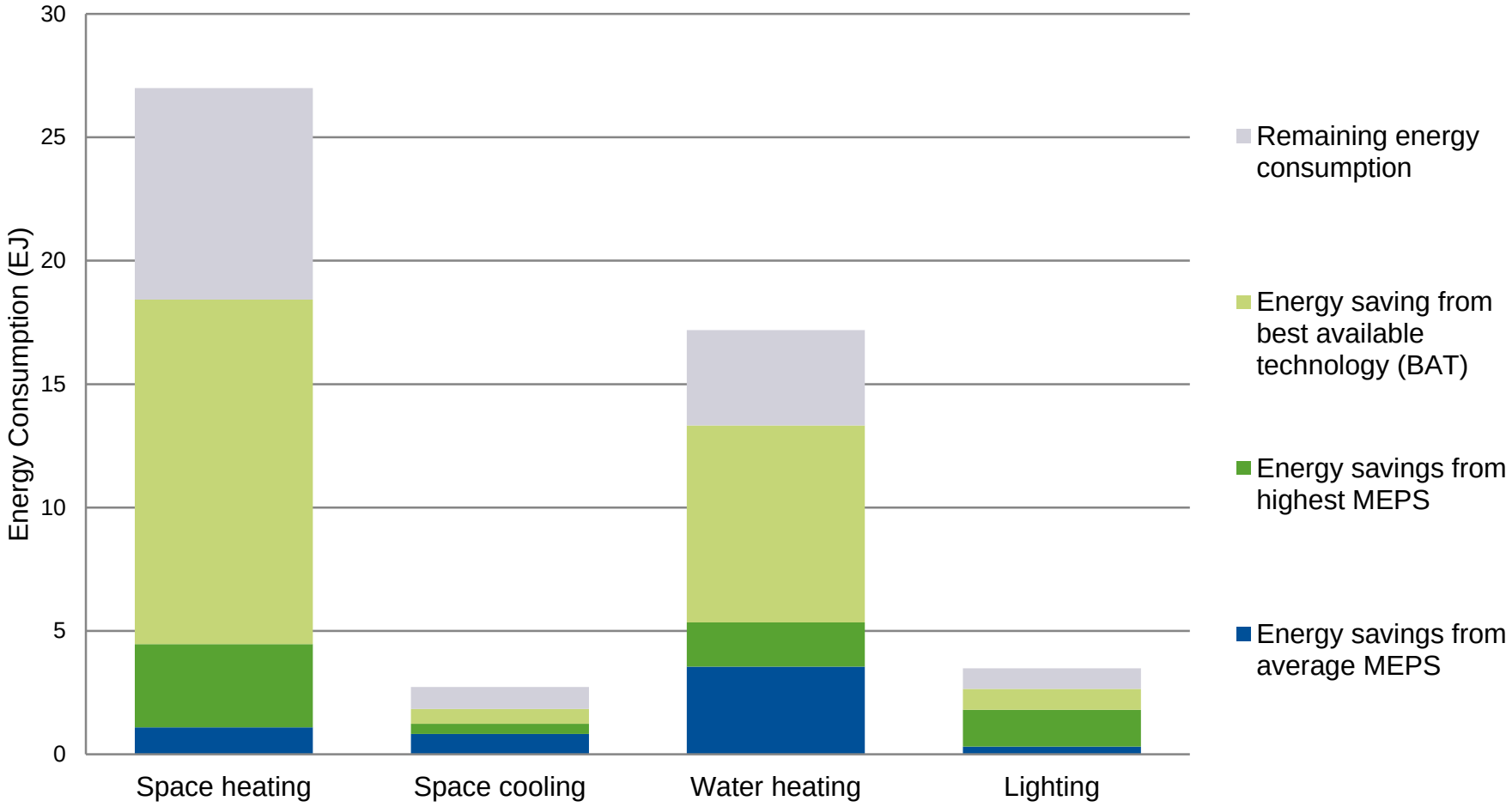


Note: kWh/m² = kilowatt-hour per square metre. / *Source: IEA (2016), Energy Technology Perspectives 2016, www.iea.org/etp.*

Building energy intensities need to decrease by at least 80% by 2050 in order to reach 2°C scenario targets by 2050.

Energy Savings Potential in Buildings



Existing technologies can save more than two-thirds of major end-use energy consumption in buildings.

Climate Commitments for Buildings

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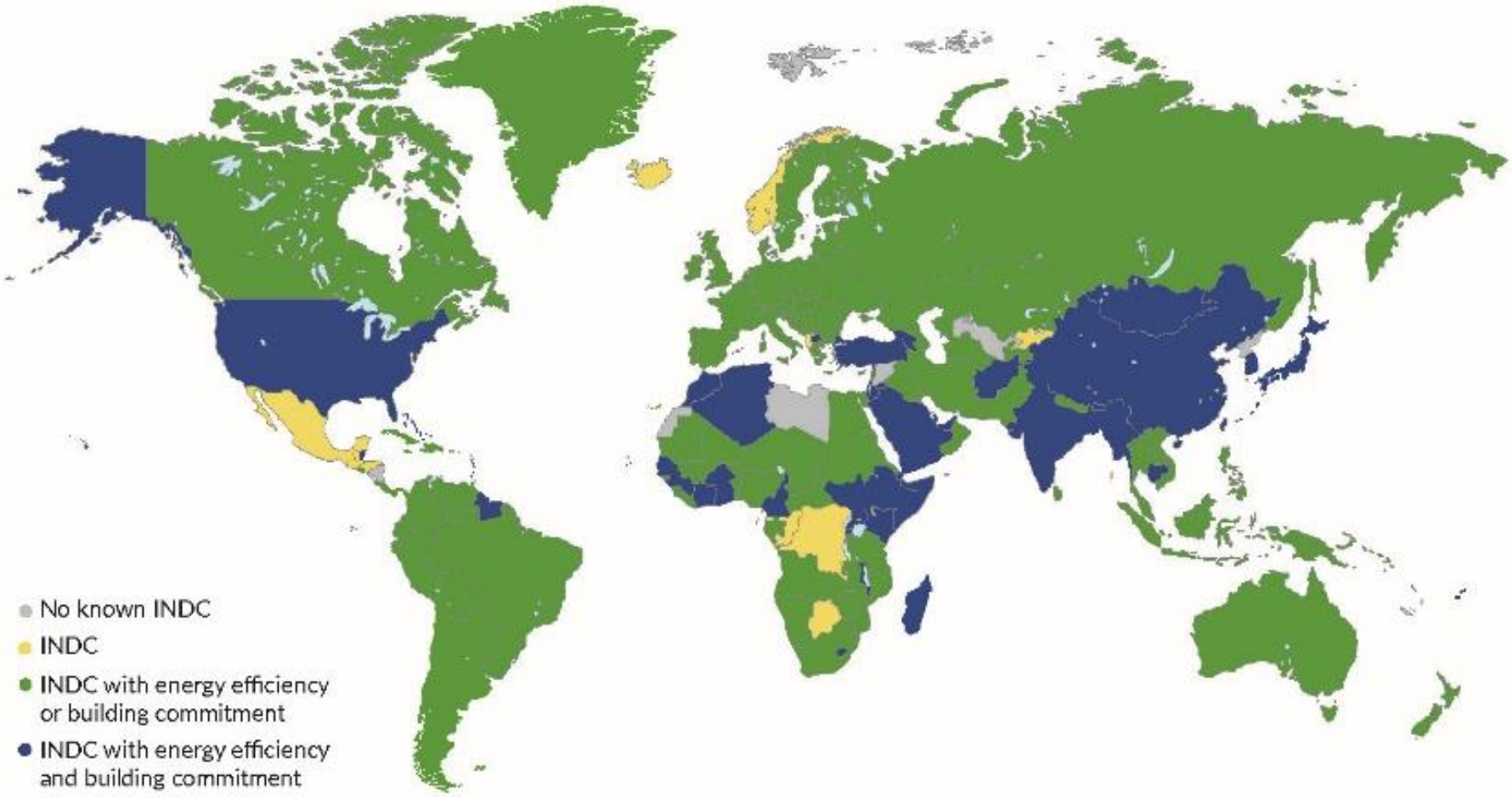

This map is without prejudice to the status of or sovereignty over any territory, to the delimitation of international frontiers and boundaries, and to the name of any territory, city or area.

Climate commitments are widespread, but specificity on building commitments are not common to date.

Energy Codes for Buildings

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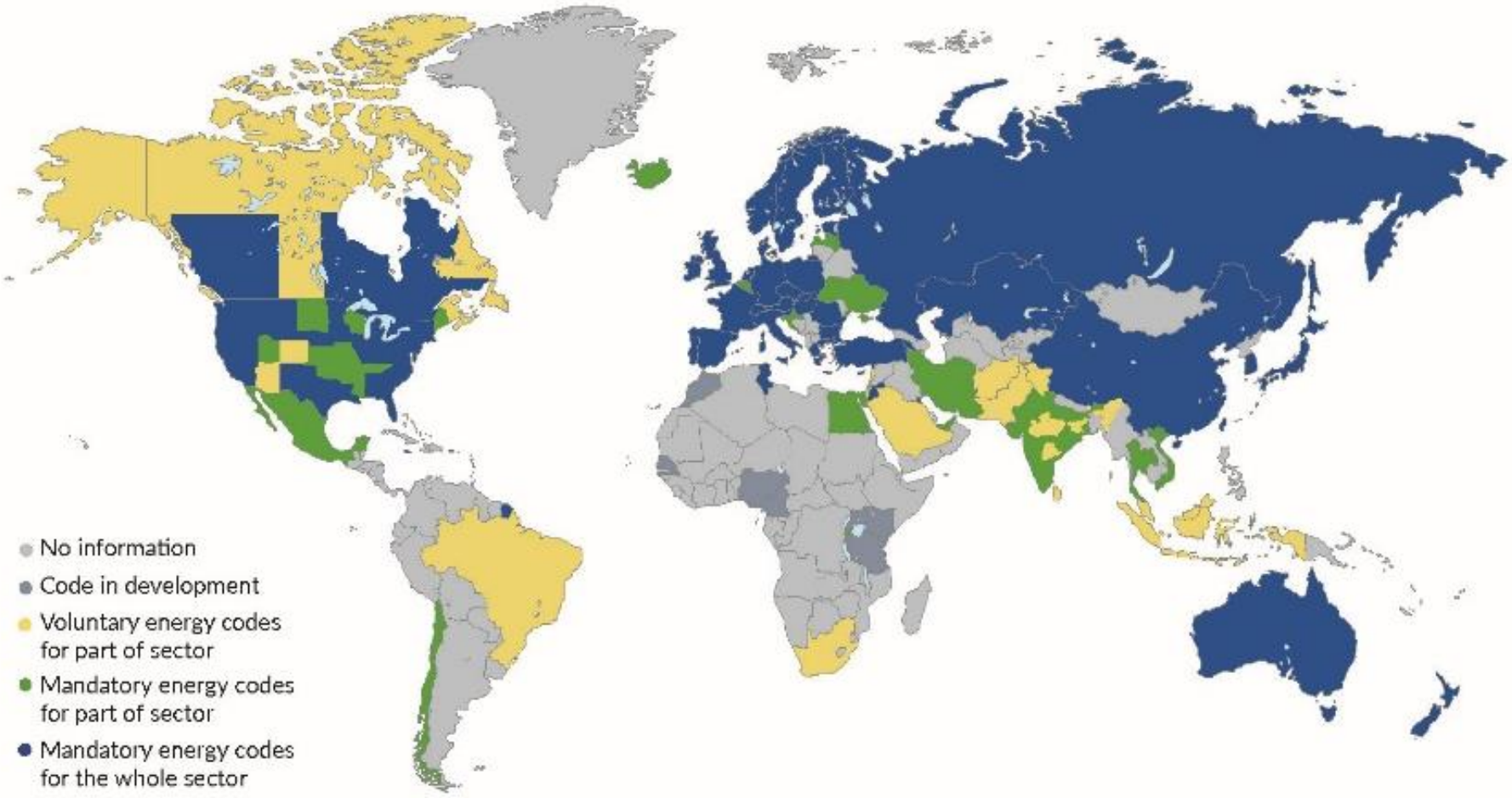

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Policy development of building energy codes is continuing to become more prevalent globally.

Energy Certification for Buildings

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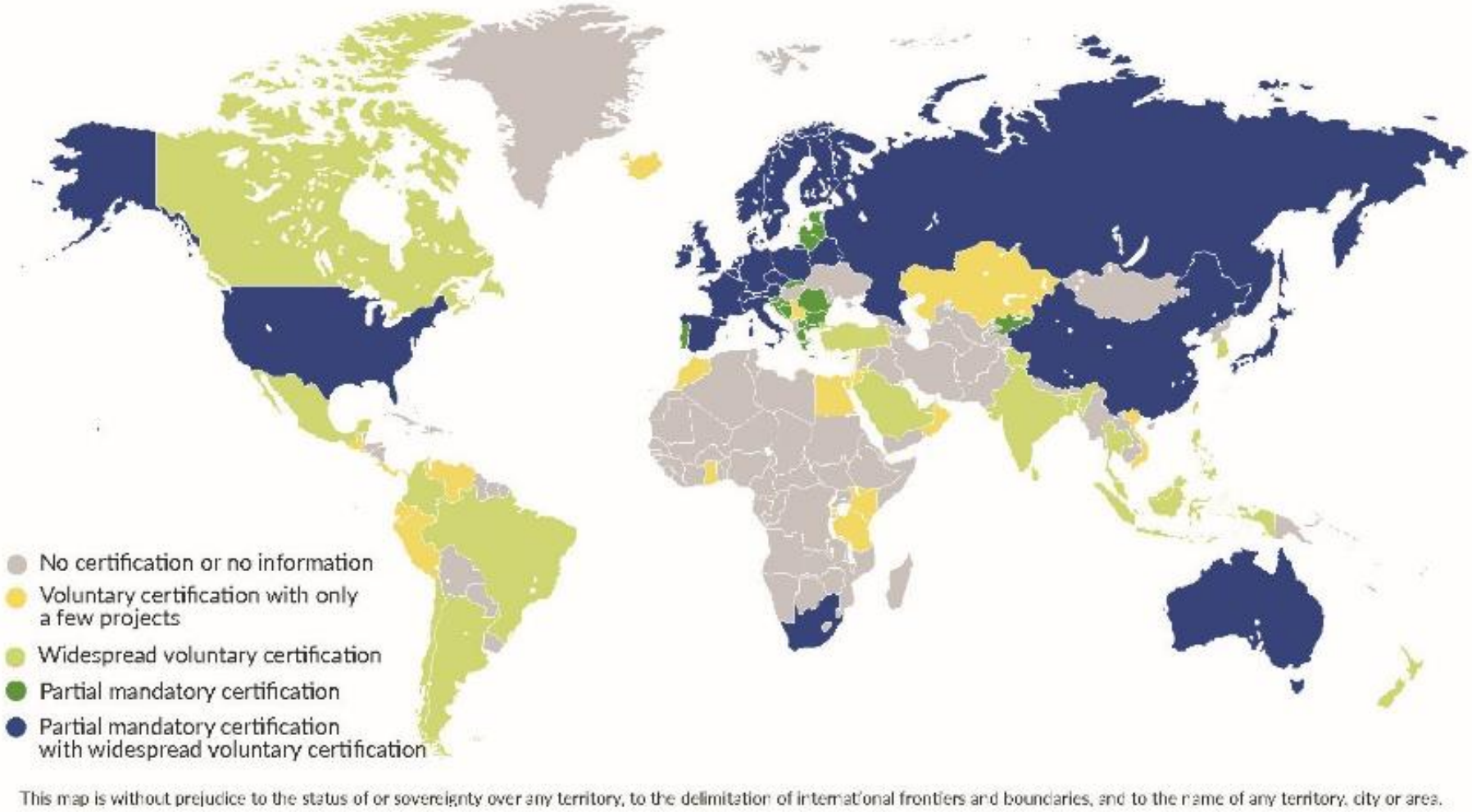
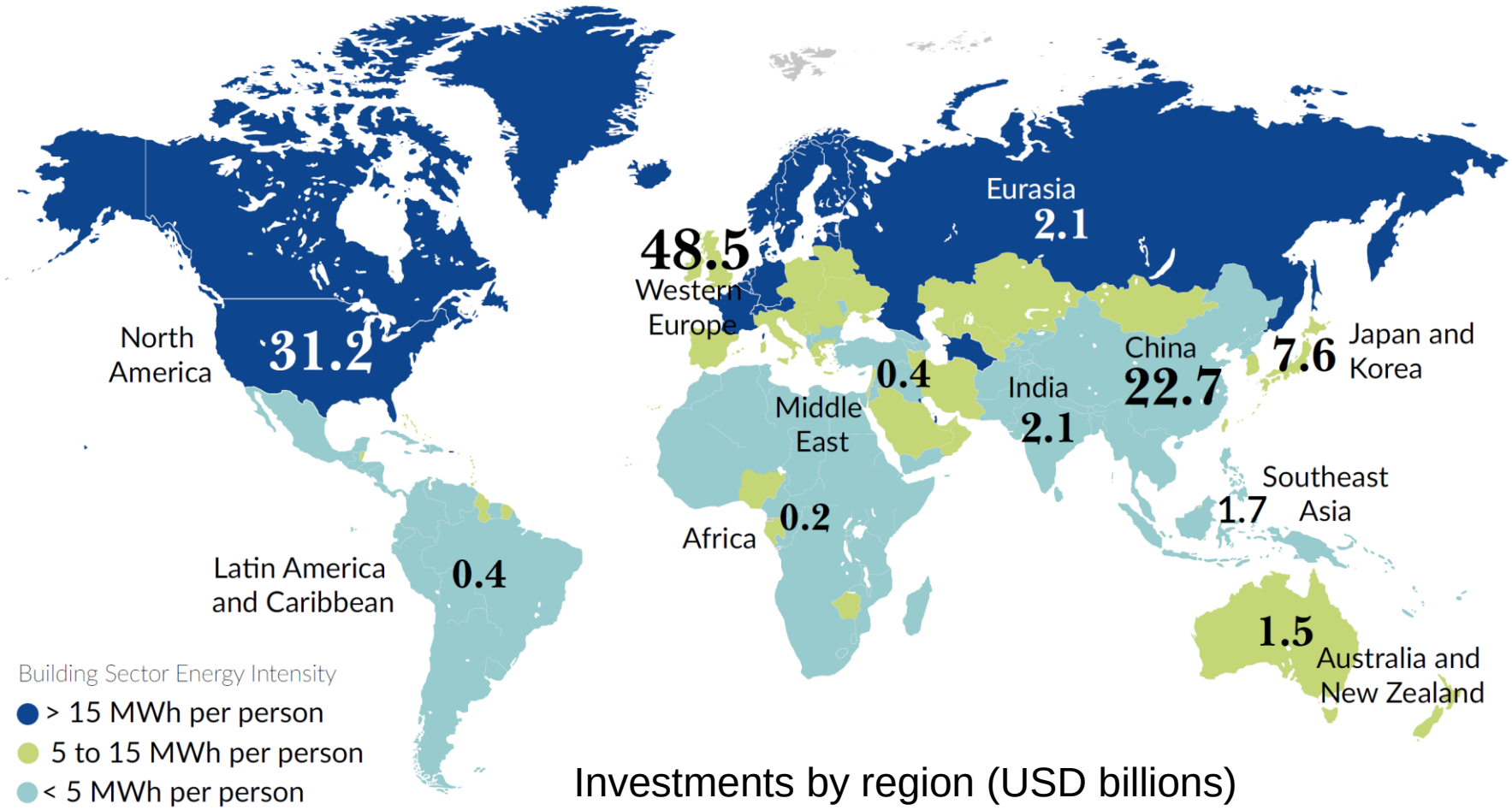


Policy development of building energy certification is continuing to become more prevalent globally.

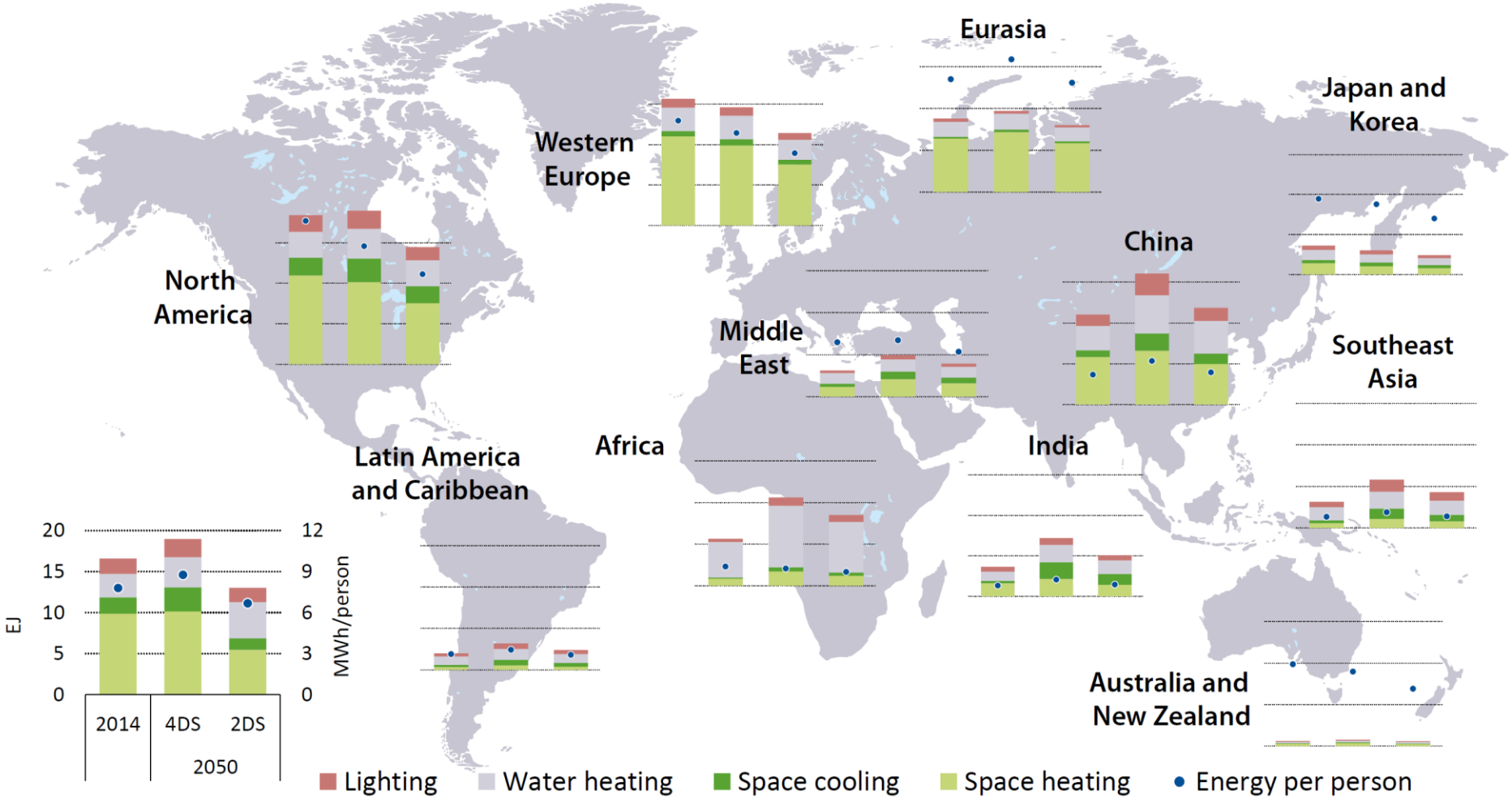
Energy Efficiency Investment in Buildings



Investments by region (USD billions)

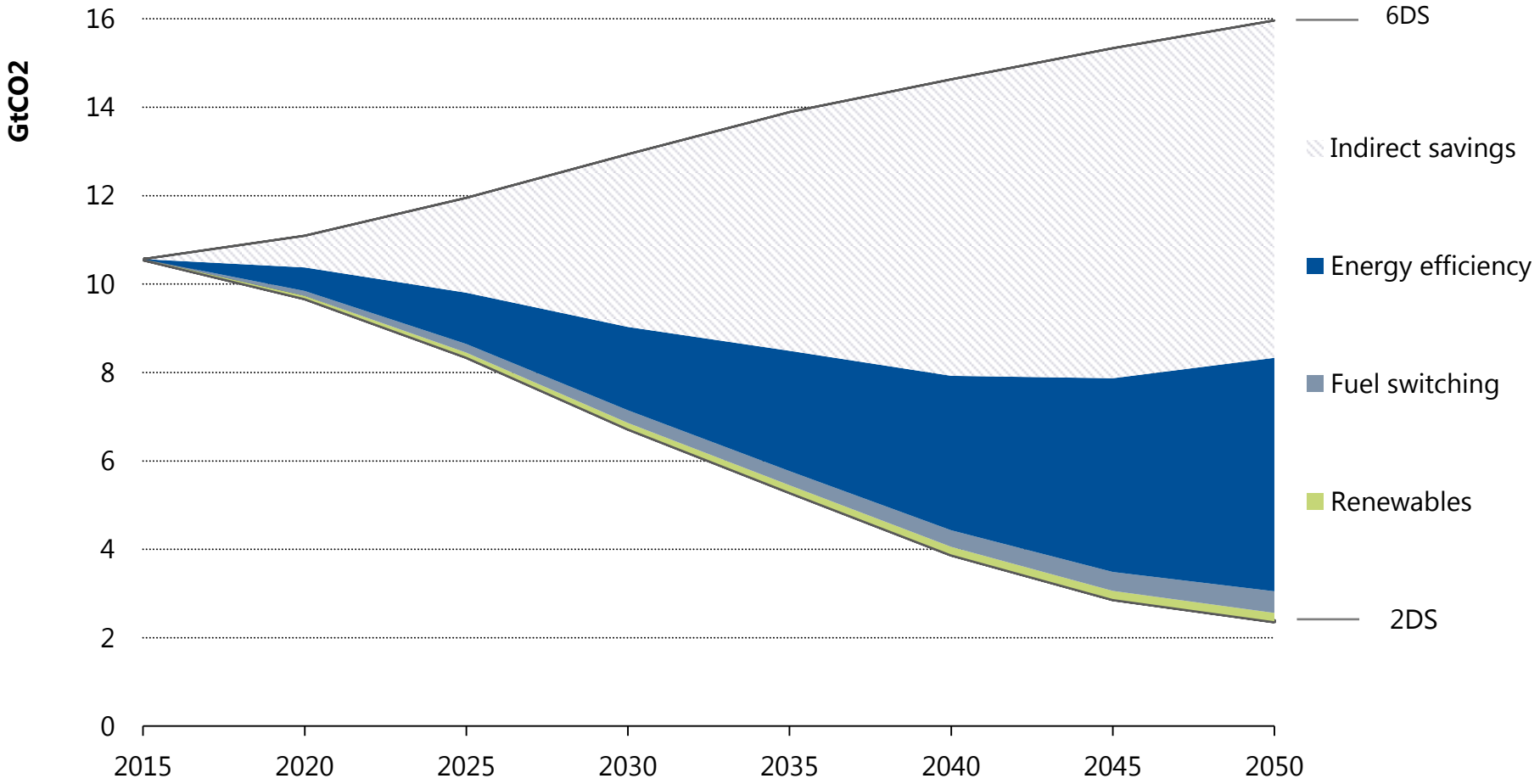
Investment in energy efficiency in buildings has continued to increase.

Sustainable Pathway for Buildings



Significant reductions in building energy use is needed to achieve the 2°C scenario out to 2050.

Emission Savings Potential for Buildings



84 $GtCO_2$ of cumulative global emissions savings potential from direct measures in buildings. 250 $GtCO_2$ when including indirect (power).

Net Zero and Passive Buildings

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© Vandemusser Design

Single Family House
North Carolina, USA

© Velux

Single Family House
France

Denmark, Solhuset | e+ School
Solhuset (The Sun House)

Building shape, orientation and windows are optimised in relation to plot and sun to maxise use of daylight and solar heat. A combined solar and geothermal system provides the needed energy for heating and hot water, while solar cells also produce electricity.

New Delhi, India | NZEB Office
Indira Paryavaran Bhavan

Solar passive design reduces heat ingress in building envelope and allows for 75% of natural daylight use to reduce energy consumption. Uses energy-efficient chilled beam system for air-conditioning and geothermal heat rejection for the cooling towers of HVAC system. On-site solar photovoltaic cells to meet total energy demand.

USA, Los Altos | e+ Office
David and Lucile Packard Foundation

Triple-paned windows reduce the thermal bridges throughout the building envelope. A cooling tower provides chilled water (circulated throughout the building to chilled beam exchangers) to a storage tank that is passively cooled during the night. Two narrow office wings are configured around a central courtyard to maximise daylighting potential.

© William Sheftall

Leon County Extension
Florida, USA

Shanghai, China | e+ Residential

Strict design of thermal insulation and exterior facade for increased shading co-efficient. Energy system includes a solar collector system, an HVAC & DHW system, an indoor terminal unit (heat recovery ventilator) and a renewable energy power system.

Israel, Ramat-Gan | NZEB Residential
Team Israel

Building-integrated photovoltaics designed for climate control and vertical solar harvesting. Designed to maximise entry of indirect natural sunlight.

Two stall office building

Brazil, São Paulo | NZEB Stadium
Estádio Nacional

Stadium includes strip of solar panels encircling the roof, which is semi-transparent, allowing natural light to filter through to reduce lighting costs.

© United Nations Environment Programme

UNEP Headquarters
Nairobi, Kenya

© Crossways Farm Village

***House Rhino*, South Africa**

© University of Wollongong

***Illawarra Flame*, Australia**

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Net zero and passive buildings are becoming more common, as they become more necessary to achieve the 2°C scenario.