



# Why are we here?

Tracing the path to low-emission, efficient and resilient buildings  
and construction

**Buildings:** Maxine Jordan, IEA and Ian Hamilton, UCL Energy Institute

Pretoria, Monday 14<sup>th</sup> October 2019

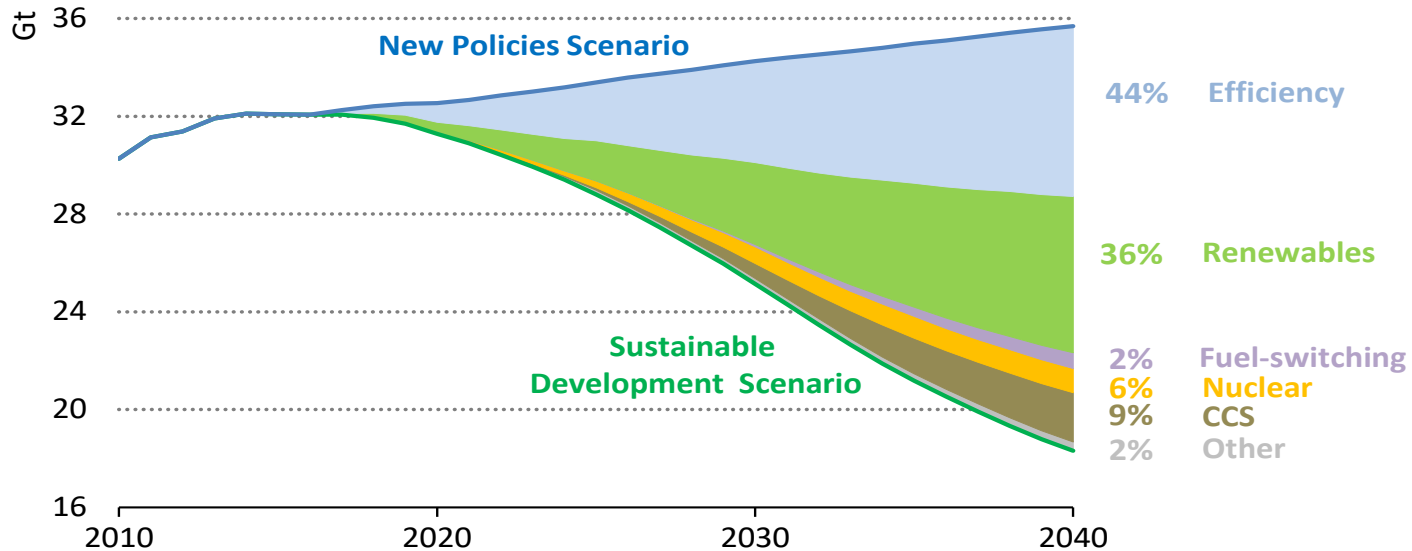
*Buildings energy efficiency sessions in partnership with*

UCL **ENERGY**  
INSTITUTE



# Energy efficiency in a secure, affordable & sustainable energy future

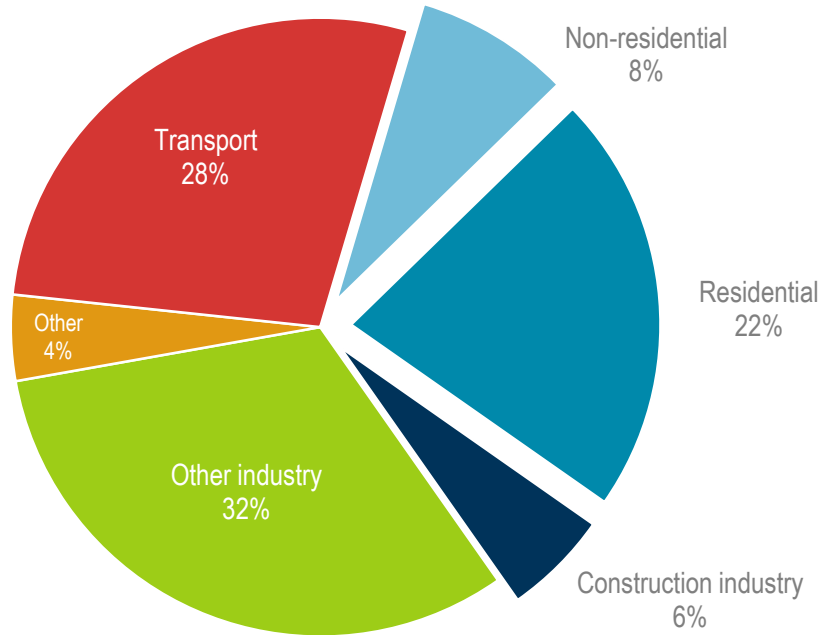
Global CO<sub>2</sub> emissions reductions in the New Policies and Sustainable Development Scenarios



The IEA's World Energy Outlook 2017 provides the context

# Global energy use

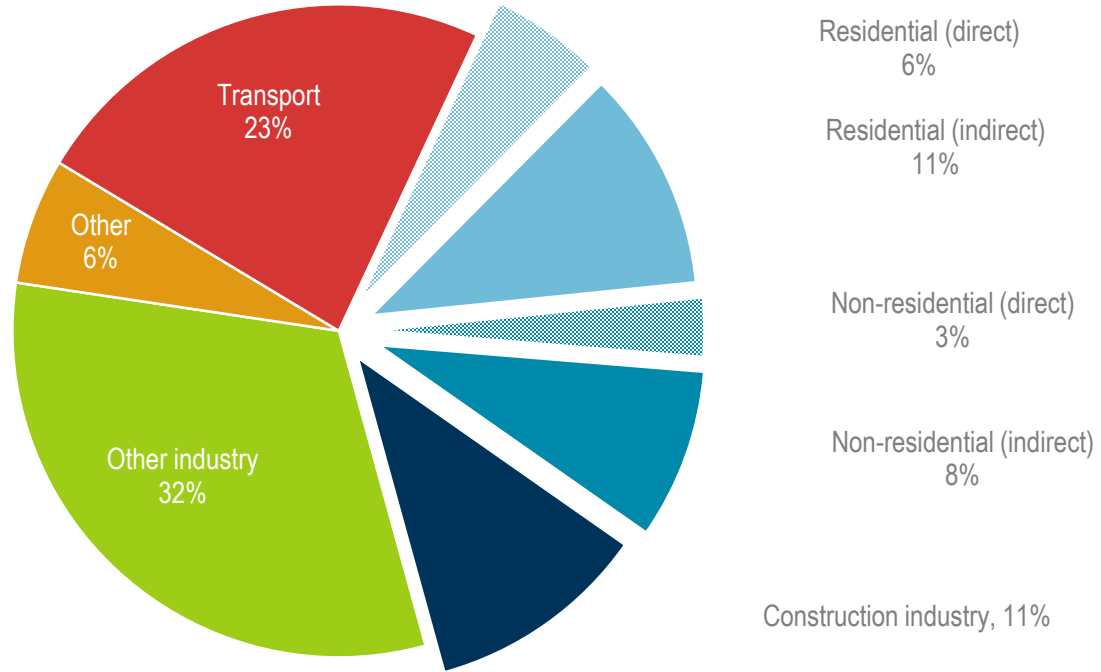
Share of global final energy consumption by sector, 2017



**The buildings sector accounts for 36% of global energy use**

# Global emissions

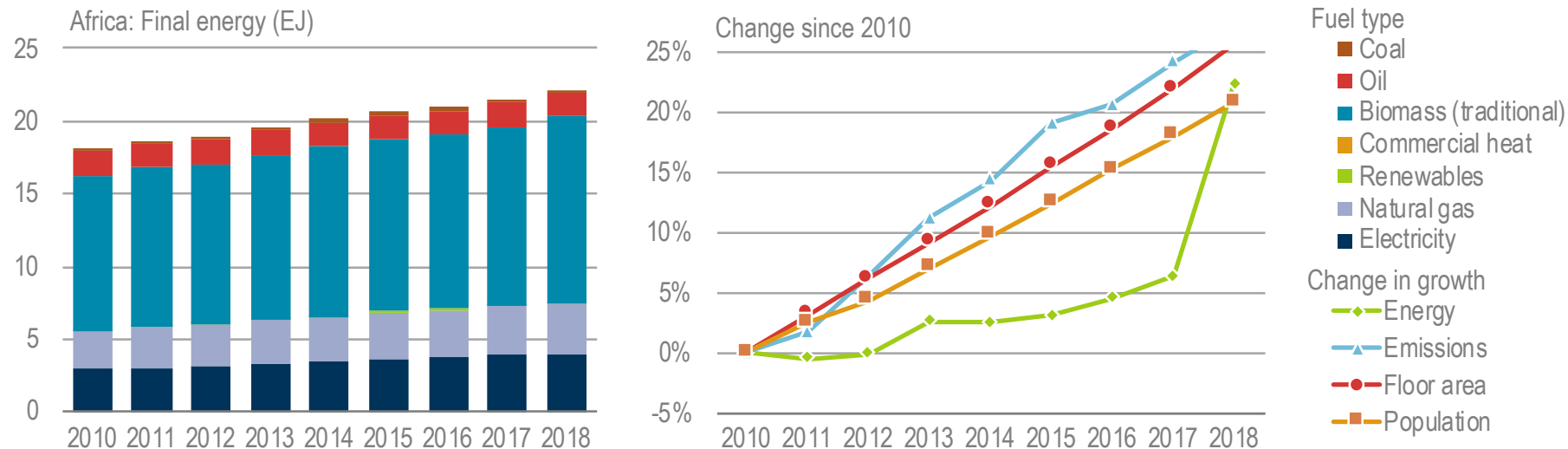
Share of global emissions by sector, 2017



**The buildings sector accounts for 39% of global energy-related emissions**

# Africa buildings

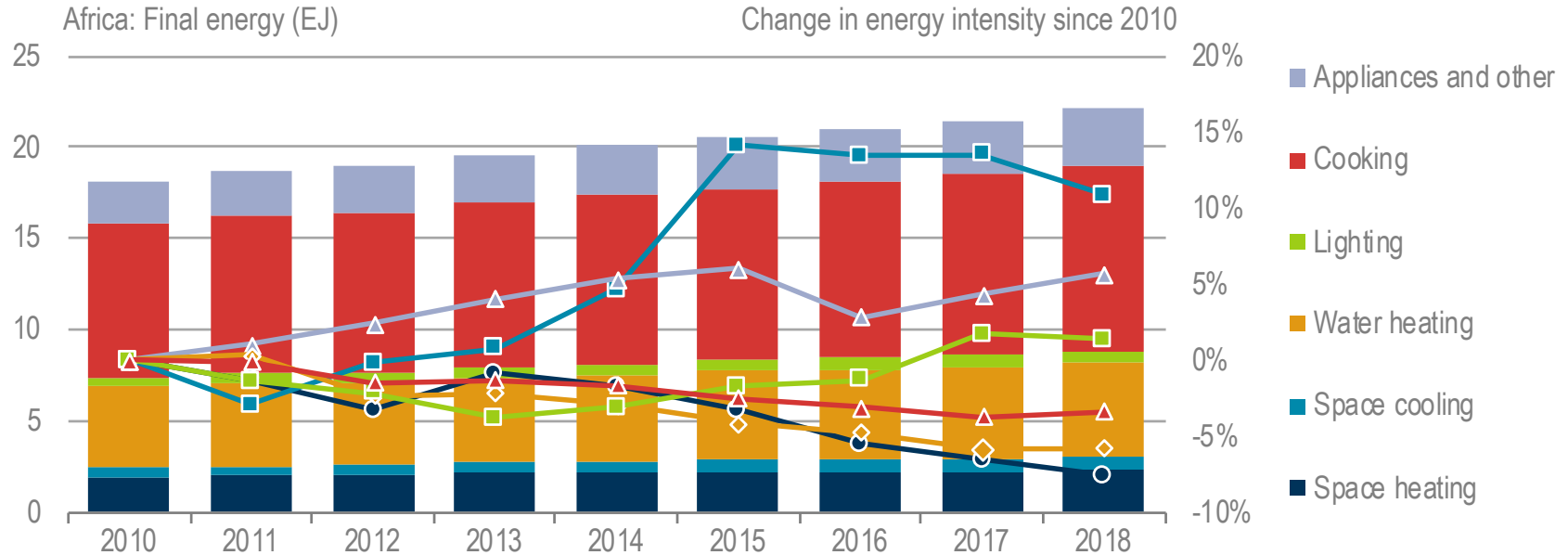
Africa final energy use by fuel type and change in indicators, 2010-18



## Growth in Biomass, natural gas and electricity

# Africa buildings

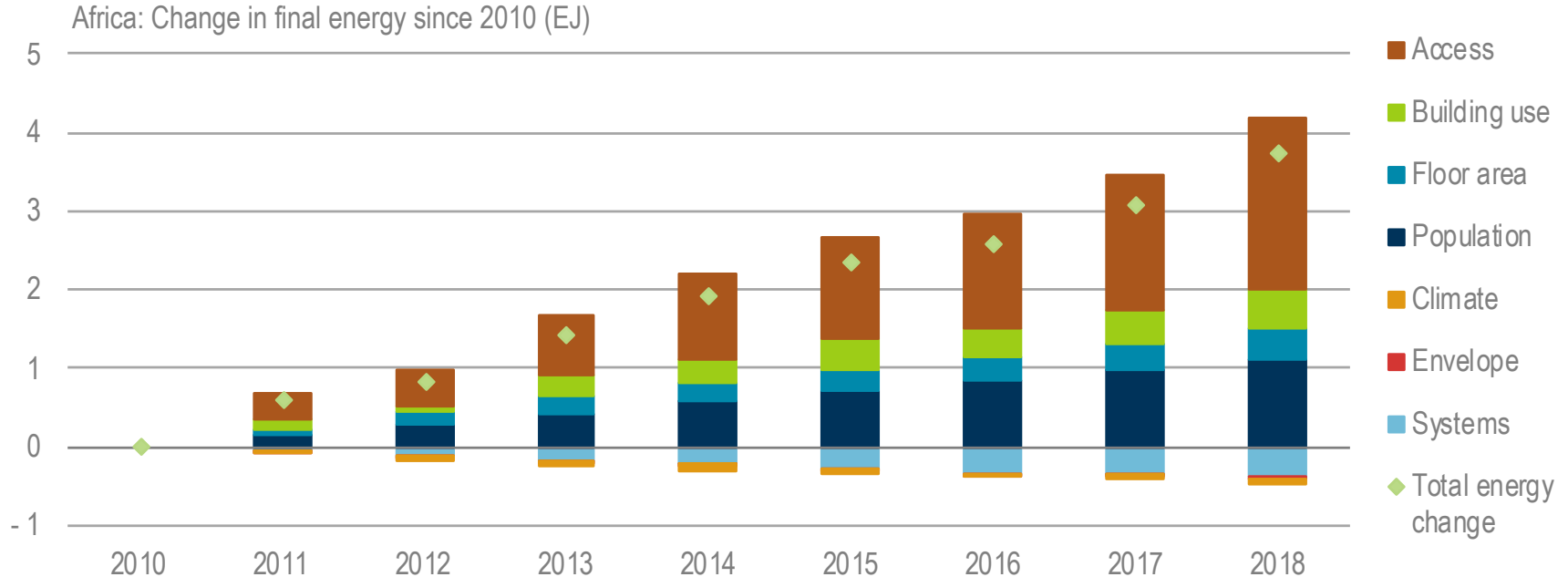
final energy use and intensity change by end use 2010-18



**Growth in cooling, though small share, and appliance and lighting**

# Africa buildings

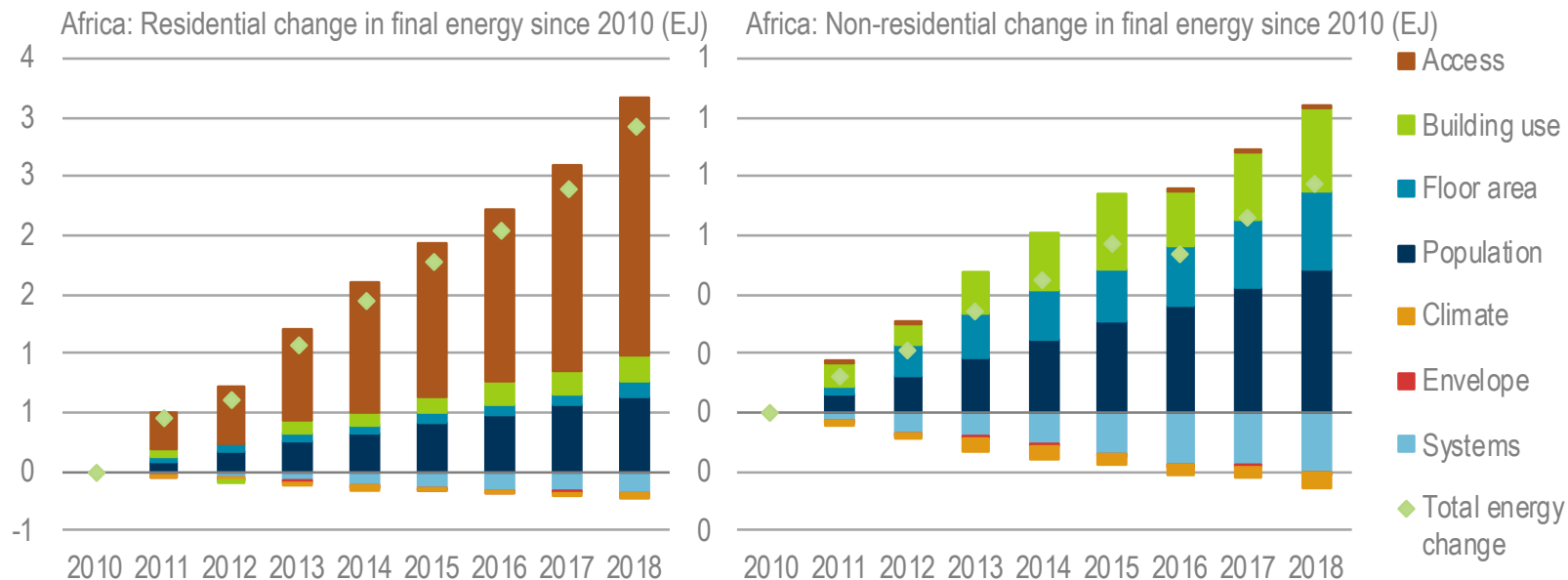
Final energy use and intensity change by end use 2010-18



**Demand for services through access and population dominate growth, with small amount of system improvement change**

# Africa buildings

Influence of factors buildings energy use by building type in Africa, 2010-18

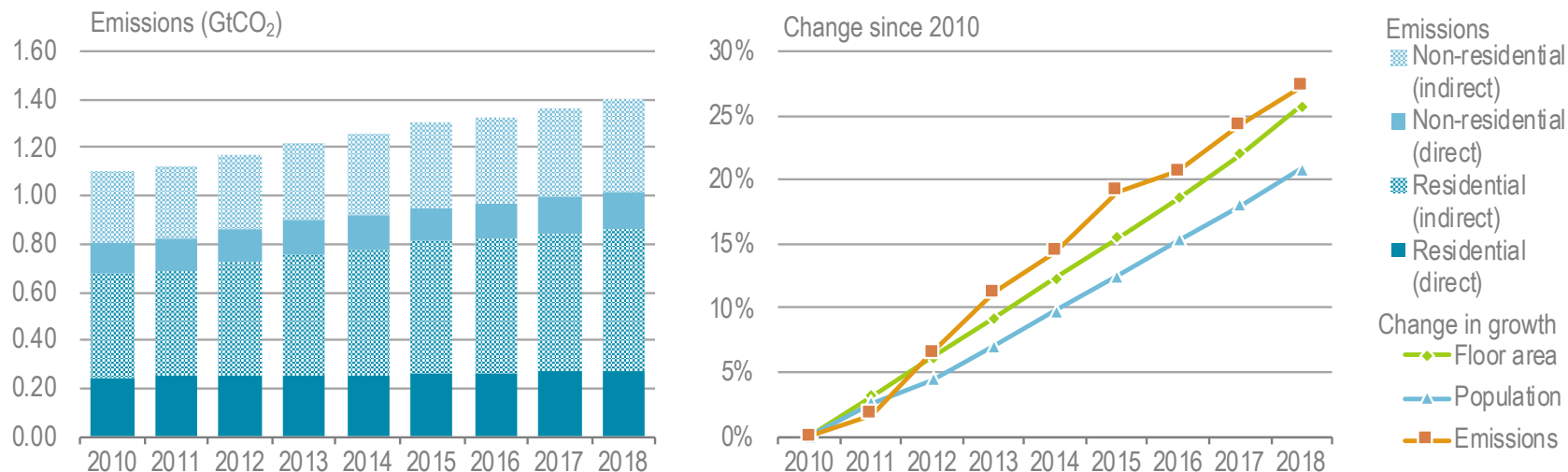


**Growth in access in residential sector compared to population, more intense buildings and floor area growth in non-residential**



# Africa buildings

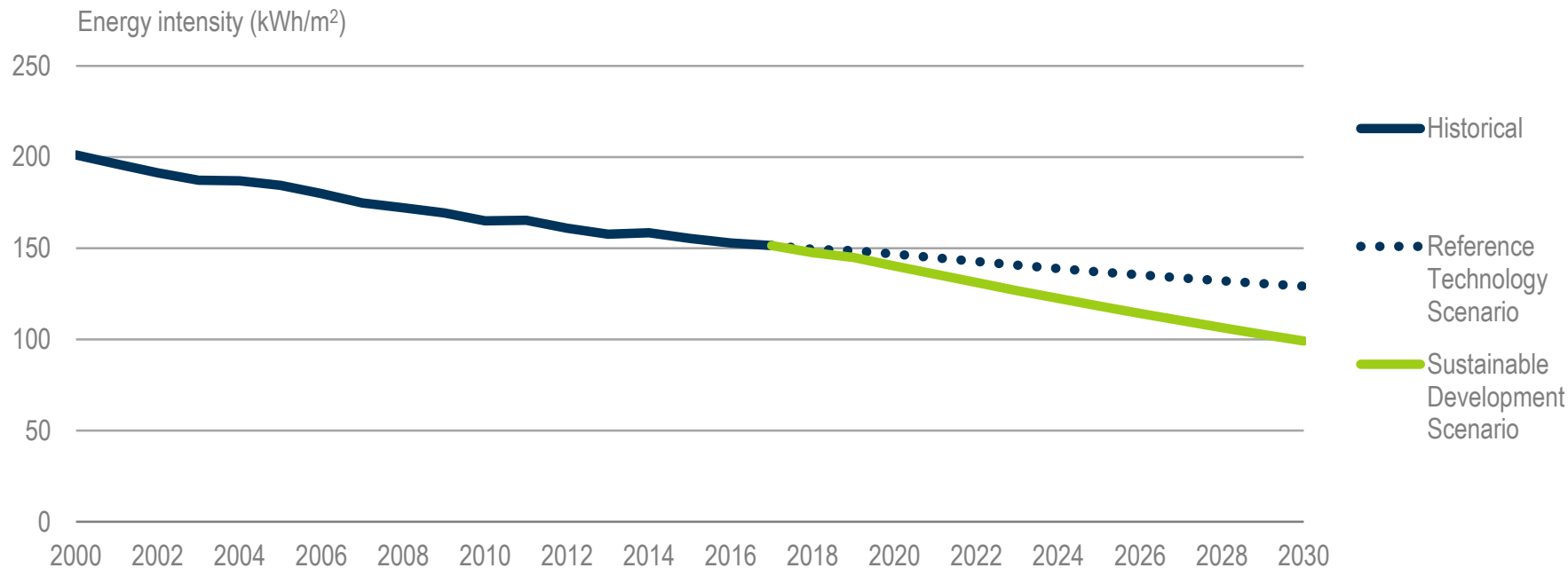
Africa buildings energy-related emissions by building type and change in indicators, 2010-18



**Emissions and tightly linked to population and floor area growth, mostly in residential access to electricity**

# Global supporting the path to sustainable development goals

Global building final energy use per unit of floor area, 2000-30

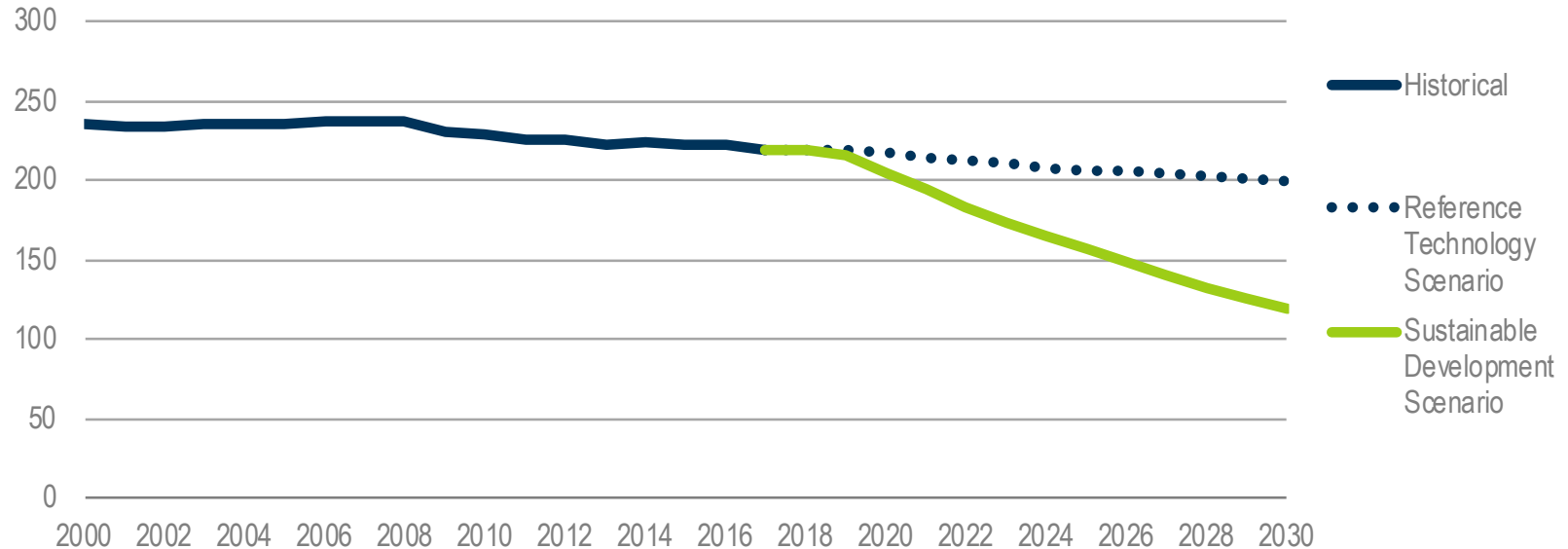


**Energy use per m<sup>2</sup> in buildings needs to be reduced by 30% by 2030**

# Africa supporting the path to sustainable development goals

Energy intensity under the sustainable development scenario, 2000-2030

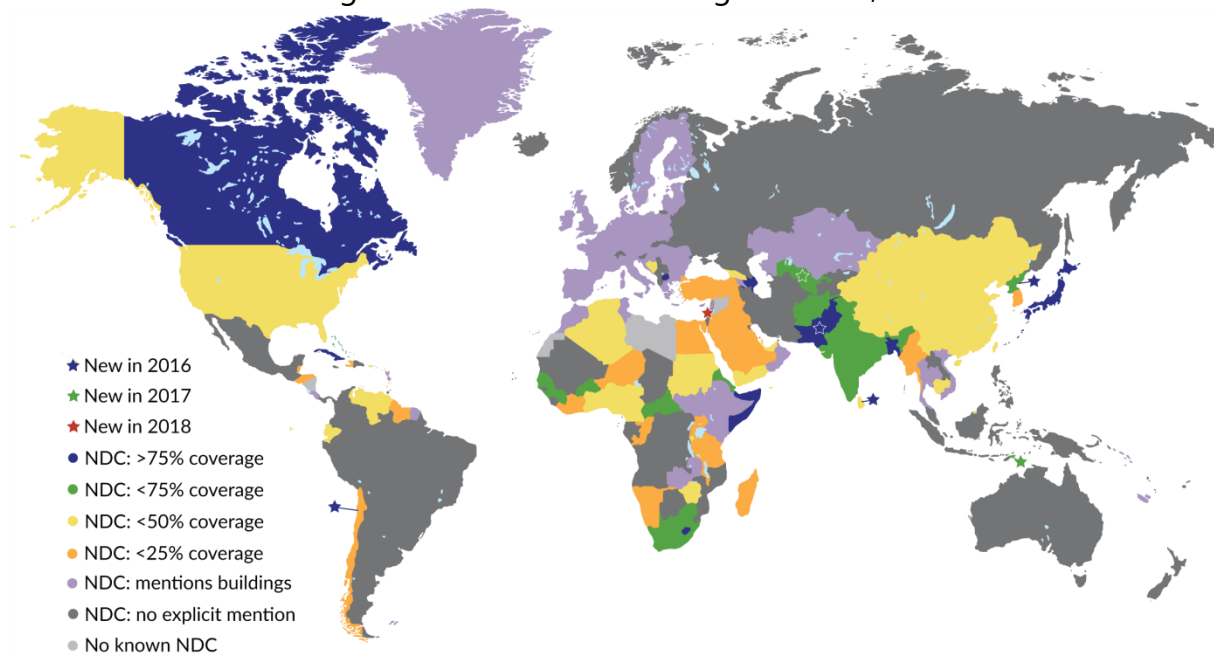
Africa: Energy intensity (kWh/m<sup>2</sup>)



**Energy use per m<sup>2</sup> in buildings needs to be reduced by 40% by 2030**

## Reason 4: defining commitments for sustainable development

Buildings sector emissions coverage in NDCs, 2017-18



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.

**The majority of NDCs today do not explicitly cover buildings sector emissions**

# Roadmap for Buildings and Construction

## 2020-2050

**To achieve low-emission, efficient and resilient  
buildings and construction**

## Current 8 strategic priority areas:

1. **Urban planning:** use urban planning policies to enable reduced energy demand, increased renewable energy capacity and improved infrastructure resilience.
2. **New buildings:** Increase uptake of new buildings with net-zero operating emissions.
3. **Building retrofits:** Increase the rate of building energy renovation and increase the level of sustainability in existing buildings.
4. **Building operations:** Reduce the operating energy and emissions through improved energy management tools and operational capacity building.
5. **Systems:** Reduce the energy and emissions needed for equipment, appliances, lighting and cooking.
6. **Materials:** Reduce the environmental impact of materials and products in buildings and construction by taking a life-cycle and circular economy approach.
7. **Resilience:** Reduce building risks related to climate change through building design, selection of materials and improving resilience to structural, water and heat risks.
8. **Clean energy:** Increase secure, affordable and sustainable energy and reduce the carbon footprint of energy demand in buildings.

# Global Roadmap for Buildings and Construction

- Urban planning
- New buildings
- Building retrofits
- Building operations
- Systems
- Materials
- Resilience
- Clean energy

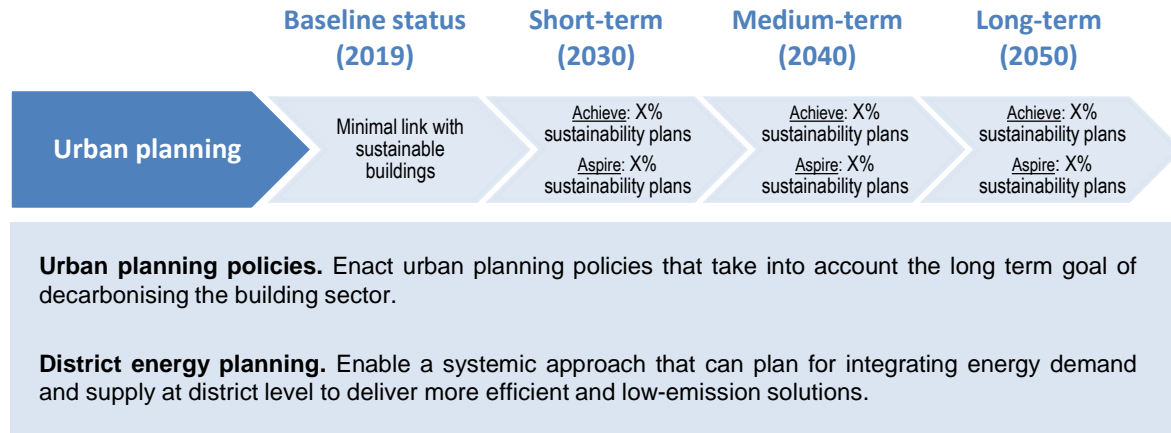


# Roadmap for Buildings and Construction

## Set targets for:

- Urban planning
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### Key actions



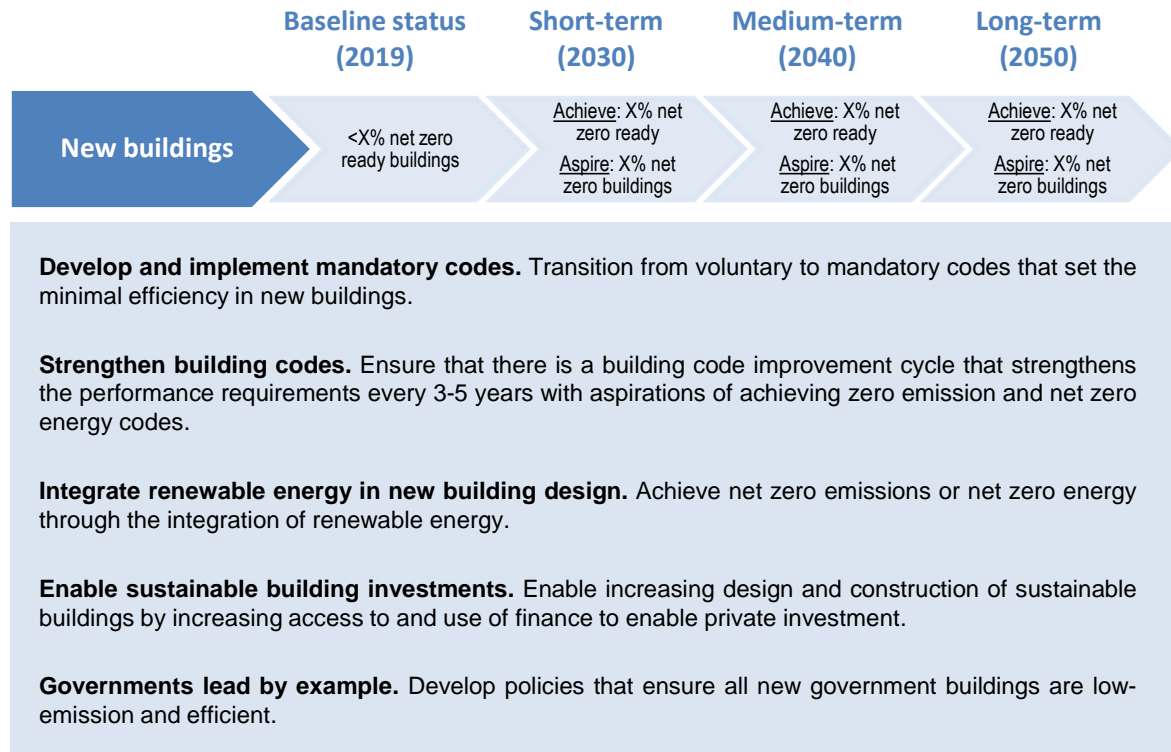


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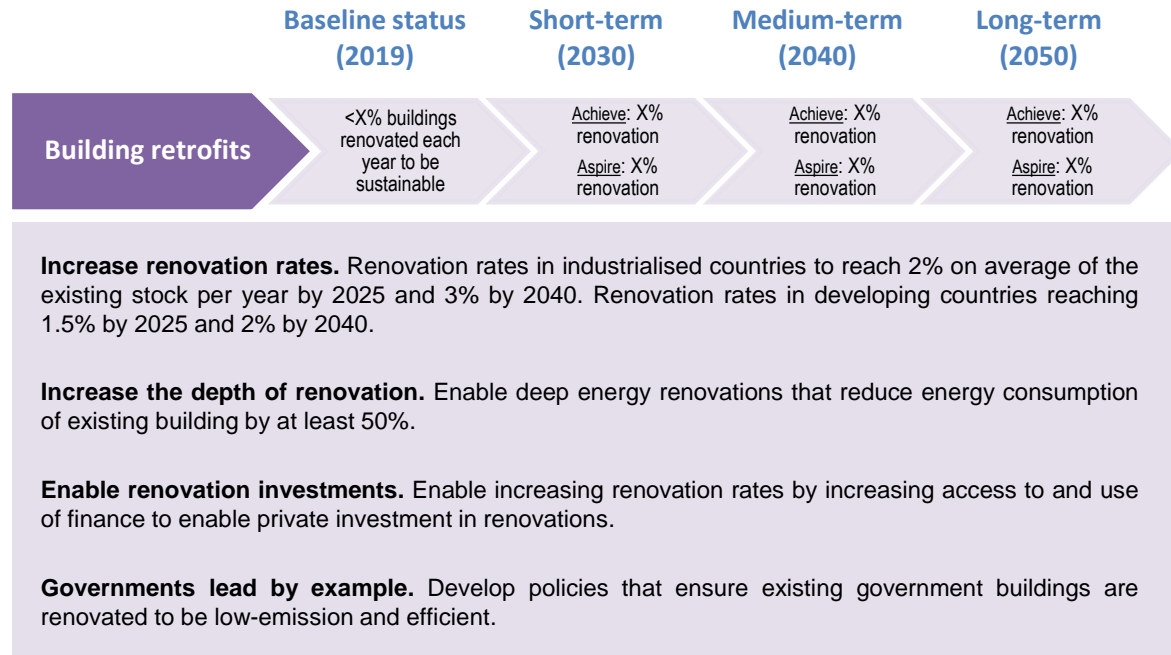


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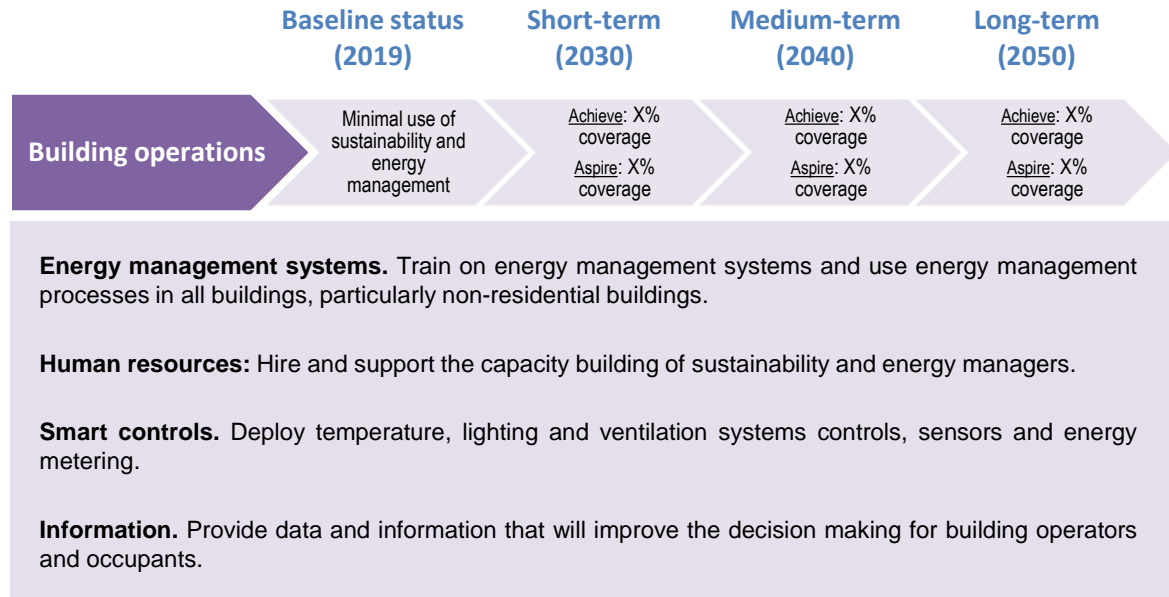


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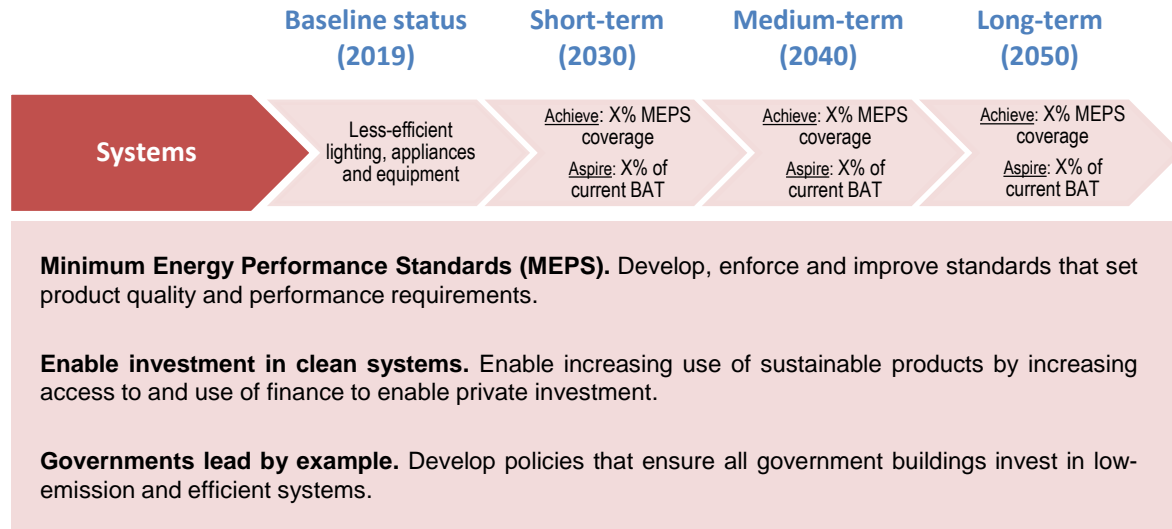


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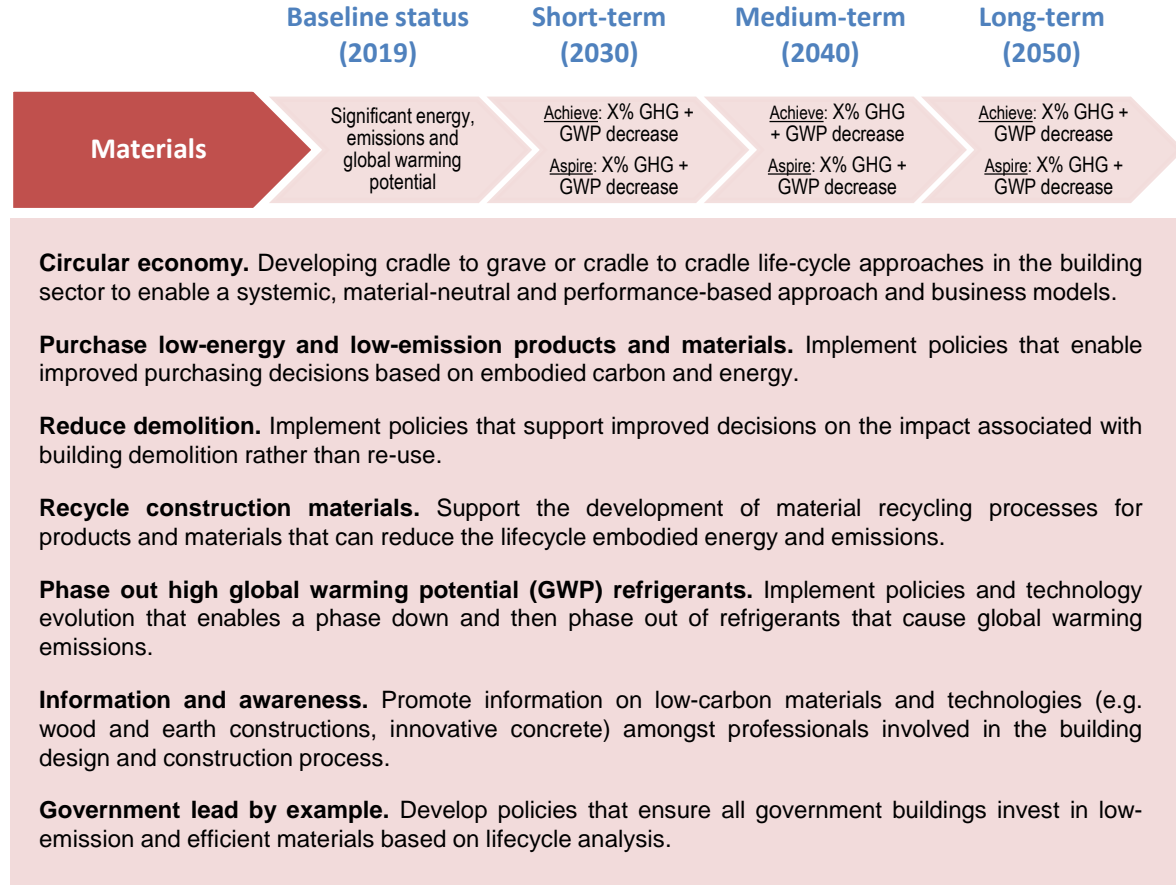


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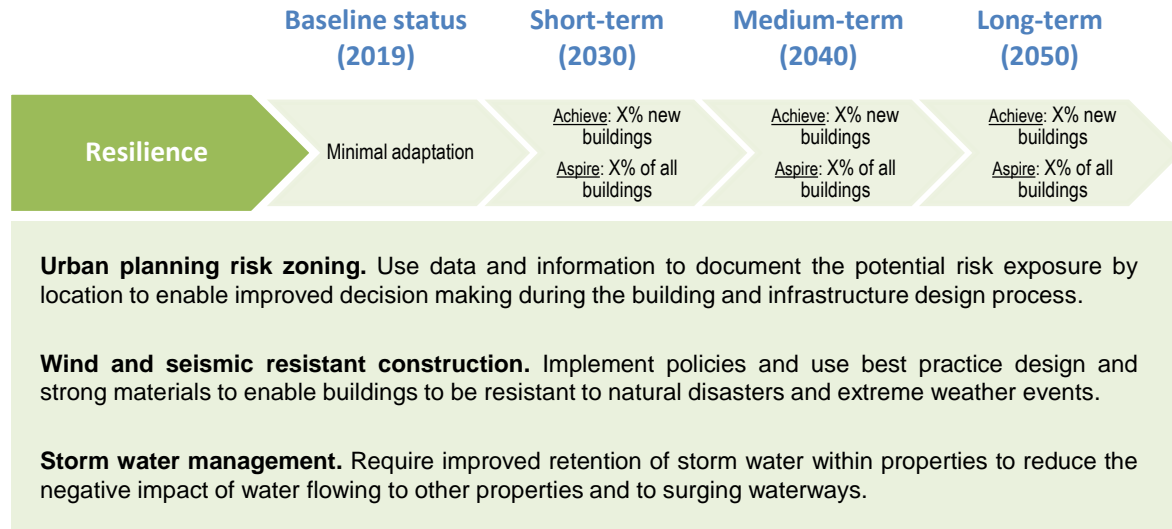


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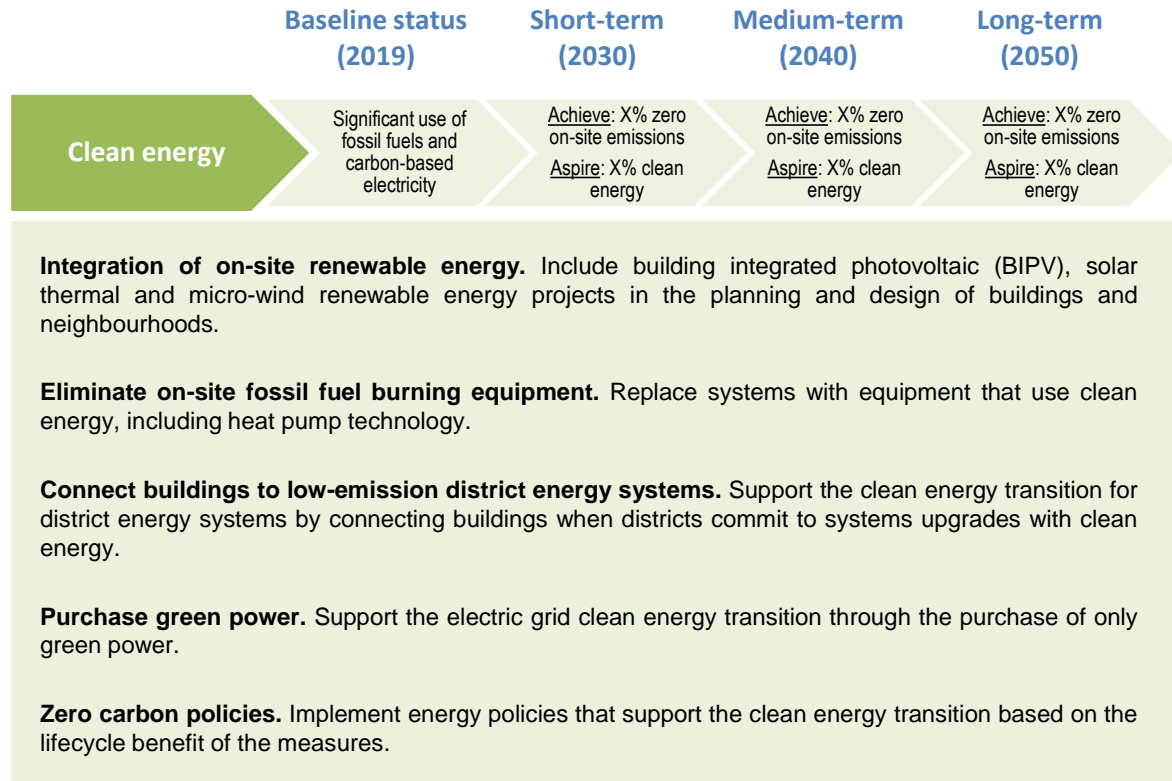


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# Global Roadmap for Buildings and Construction



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# Buildings could be 40% more efficient than today

## What is possible by 2040



- Building space could increase by 60% for no additional energy use.
- Space heating, cooling and water heating offer 60% of savings.

## Key policy actions

- Comprehensive efficiency policies, targeting both new and existing building stock and appliances.
- Incentives to encourage consumers to adopt high efficiency appliances and undertake deep energy retrofits.
- Improved quality and availability of energy performance information and tools.

