

UN Sustainable Development Goals, 2030

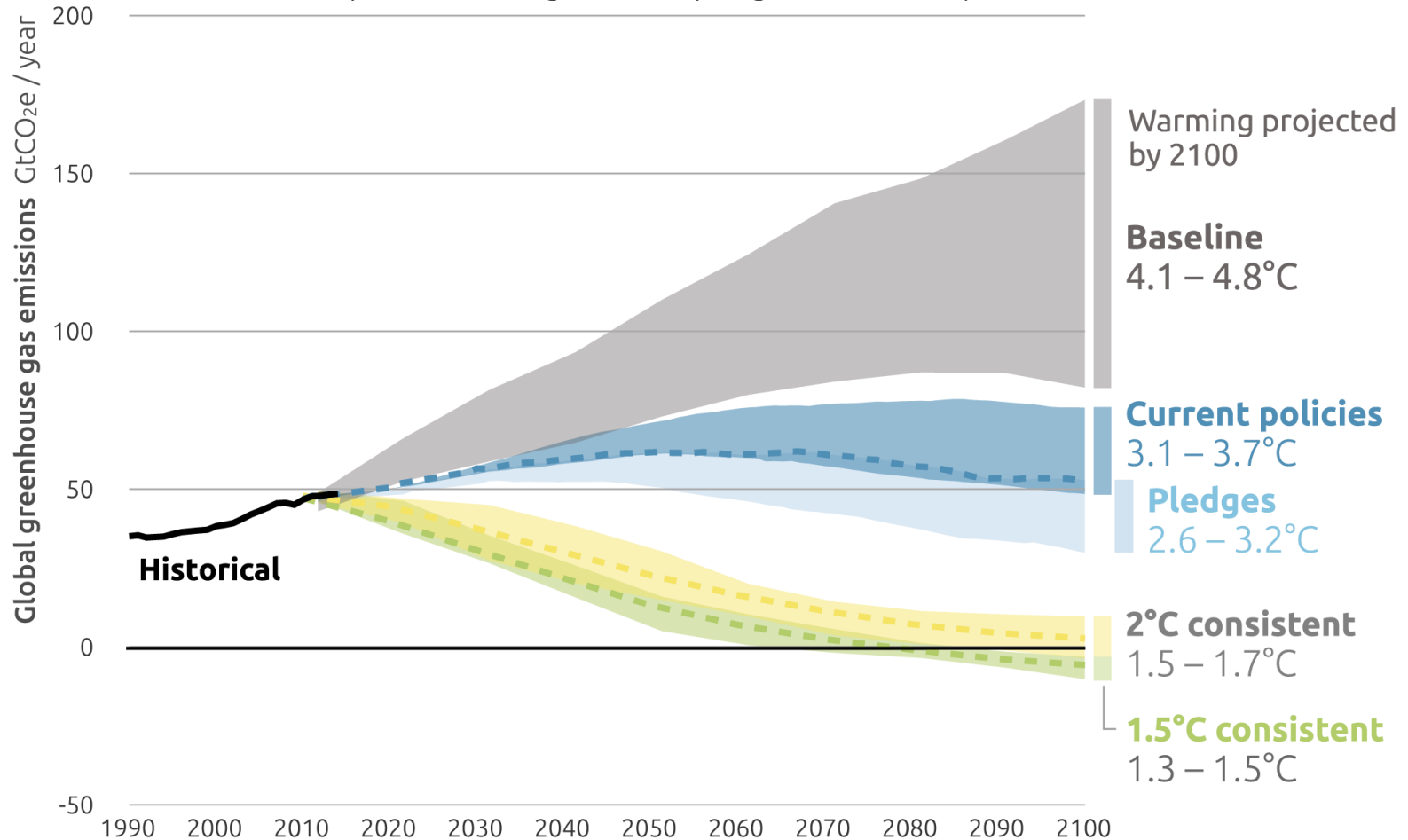


Climate Change

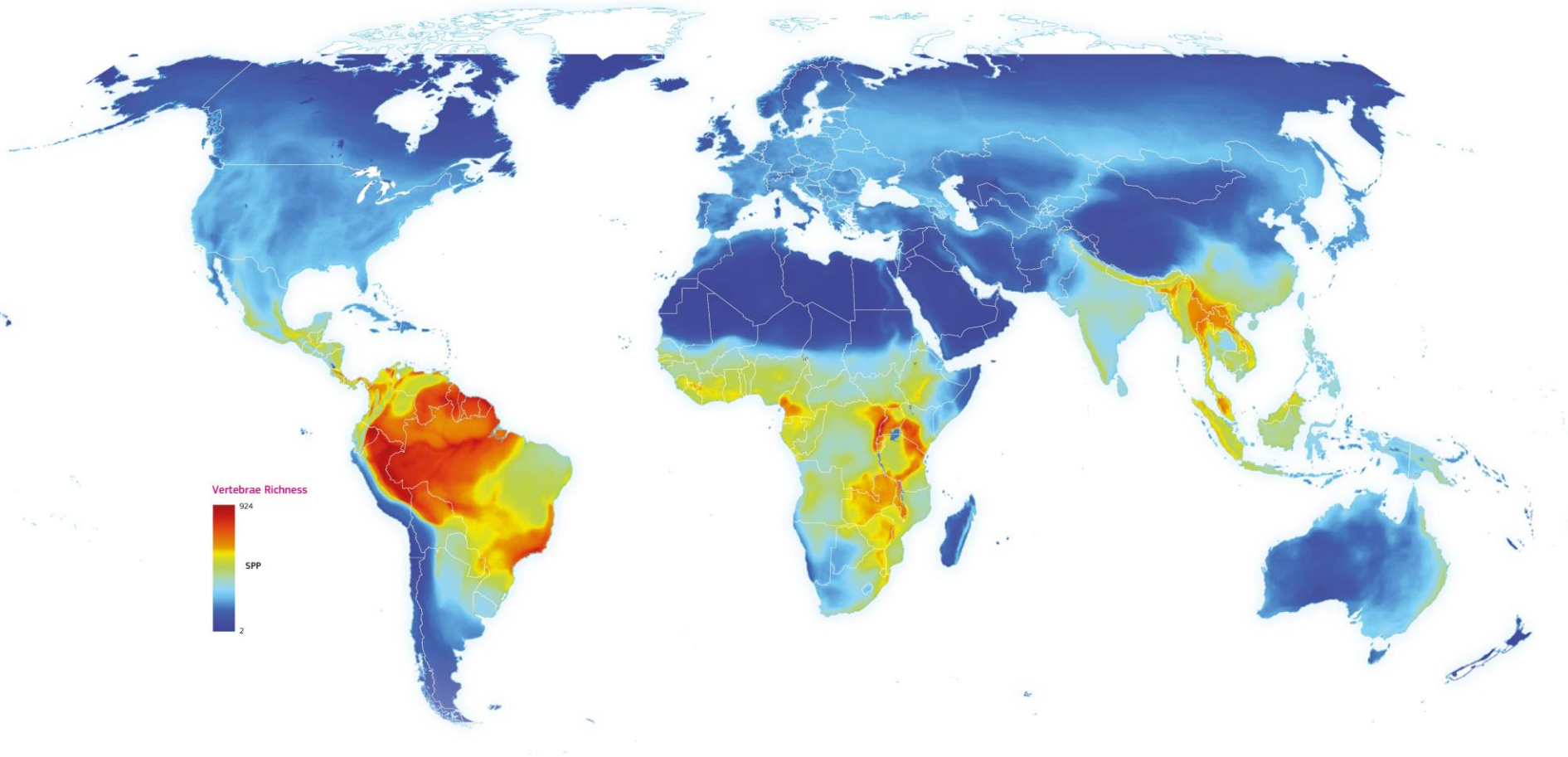


2100 WARMING PROJECTIONS

Emissions and expected warming based on pledges and current policies

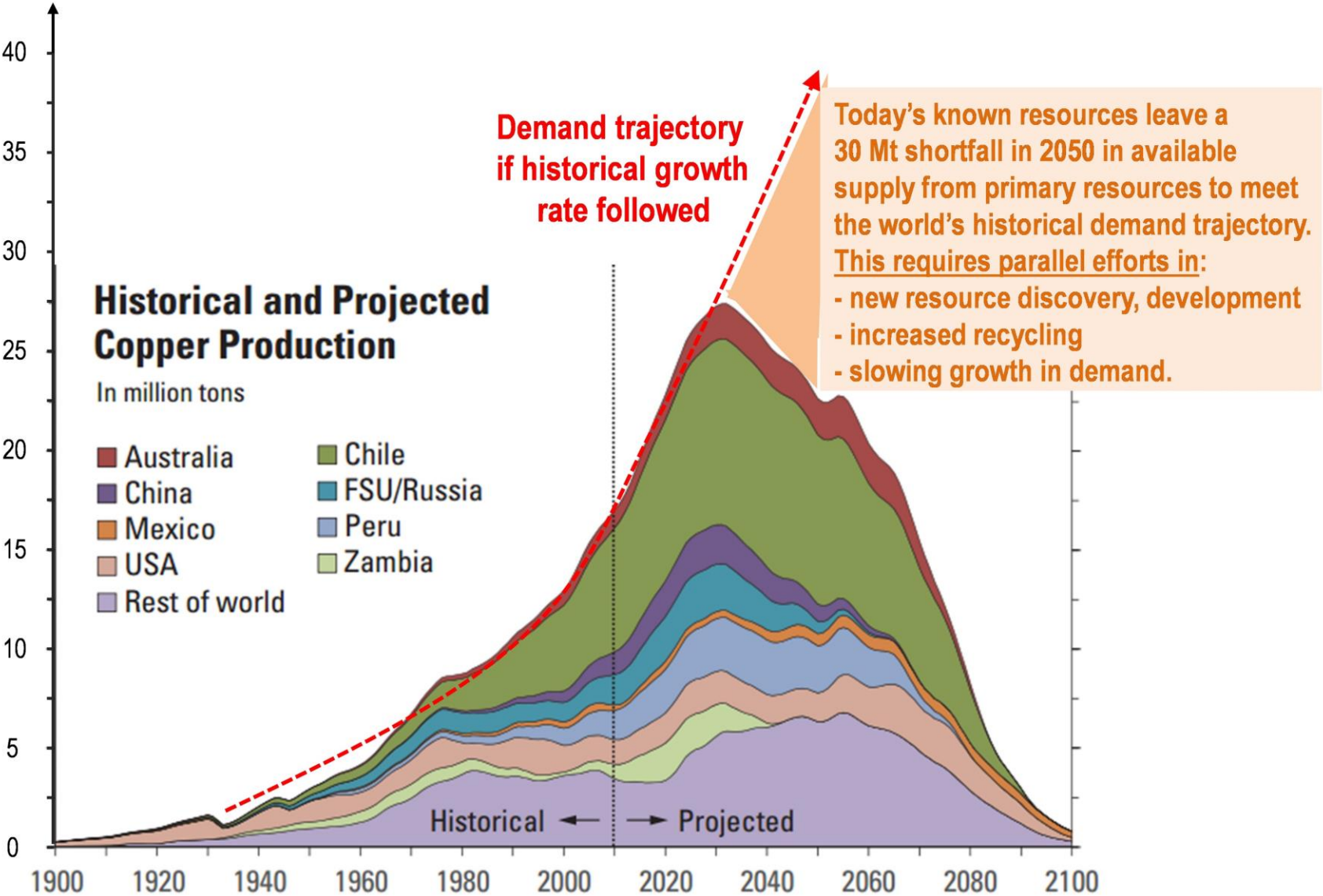


Loss of Biodiversity



Source: 'World Atlas of Desertification', European Commission, 2013

Natural resource depletion



Transportation



Transportation, (Lagos)

Resilience



Resilience, (Yangon)

Urban Planning

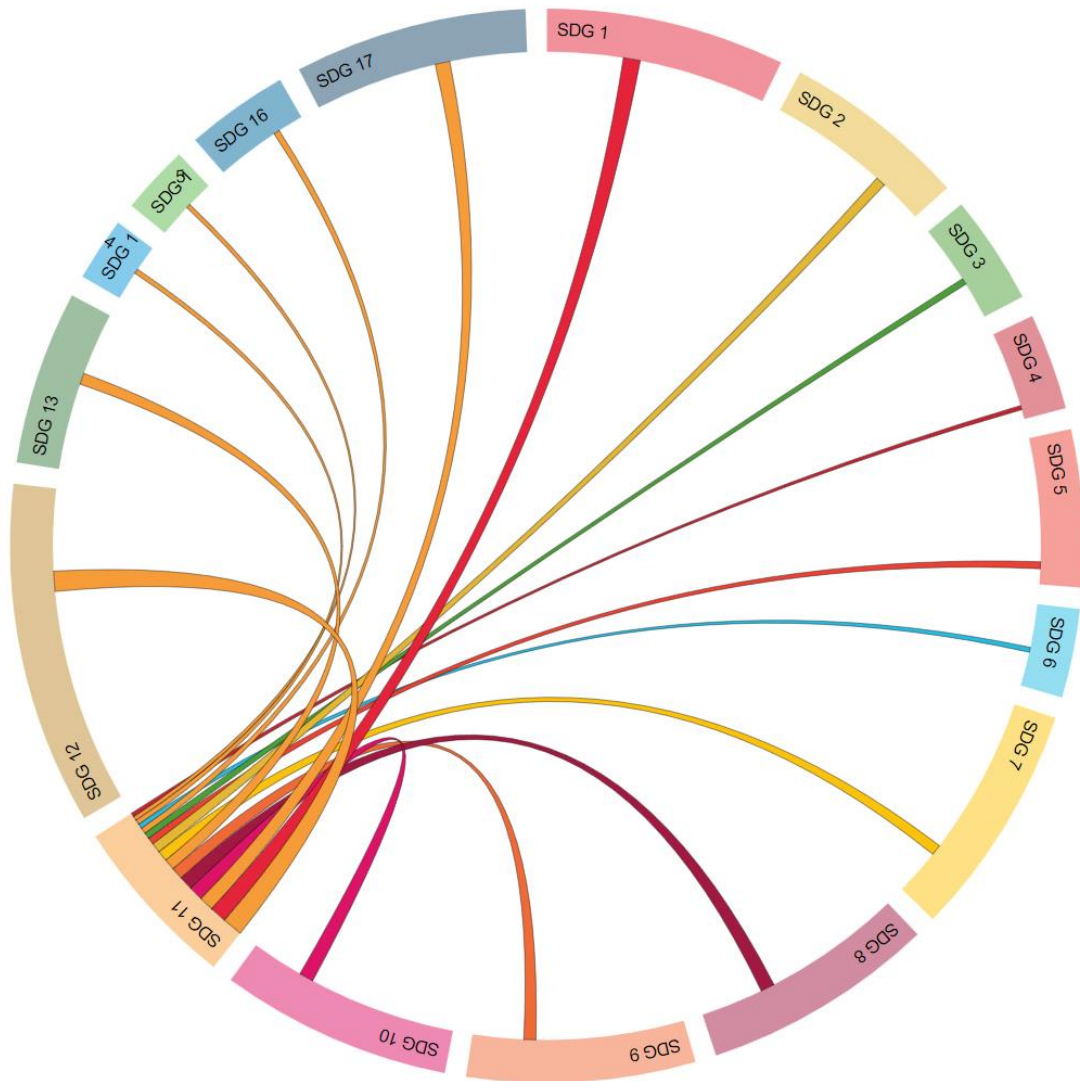


Urban Planning (Johannesburg)

UN Sustainable Development Goals, 2030

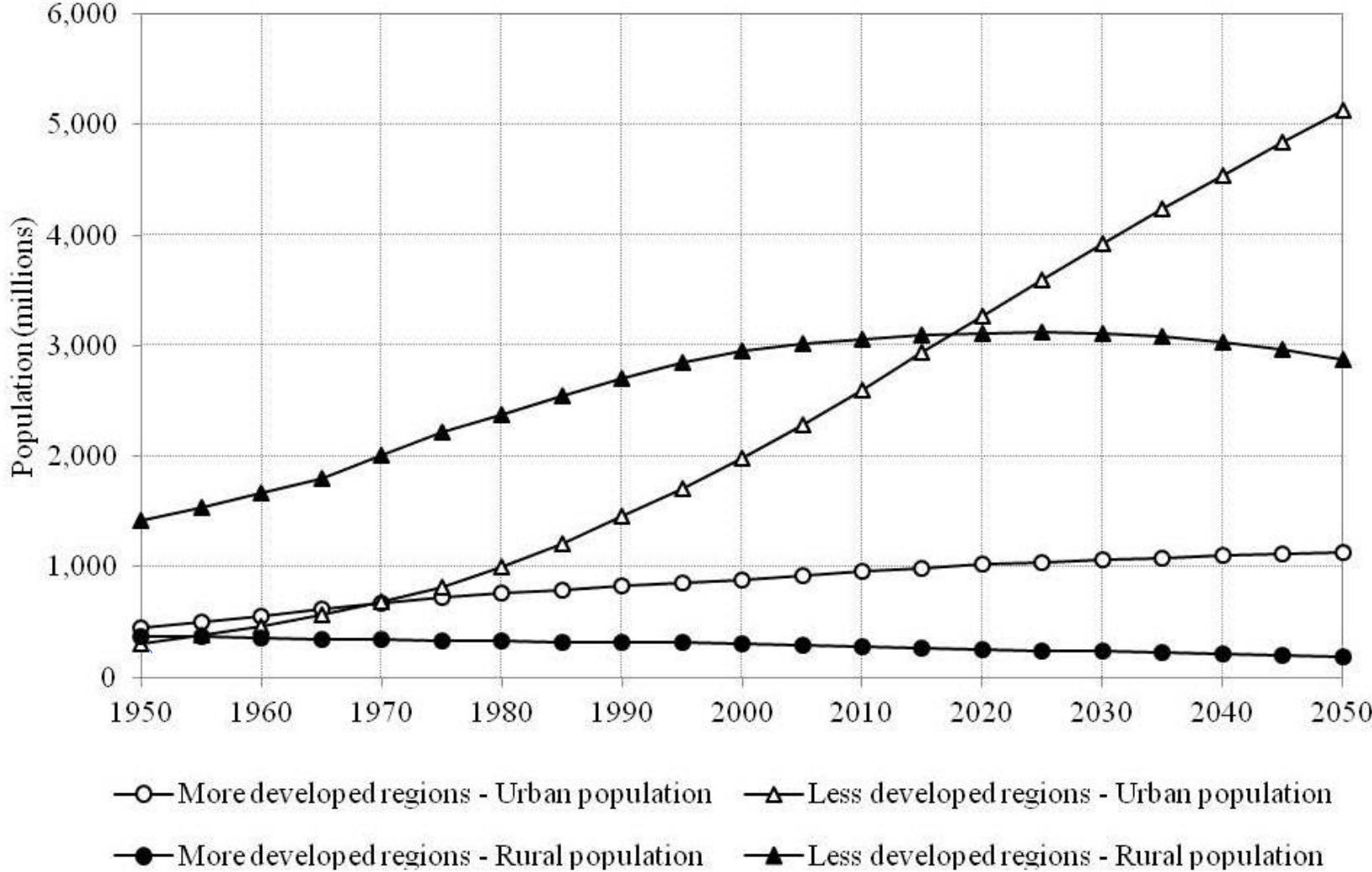


UN Sustainable Development Goals, 2030

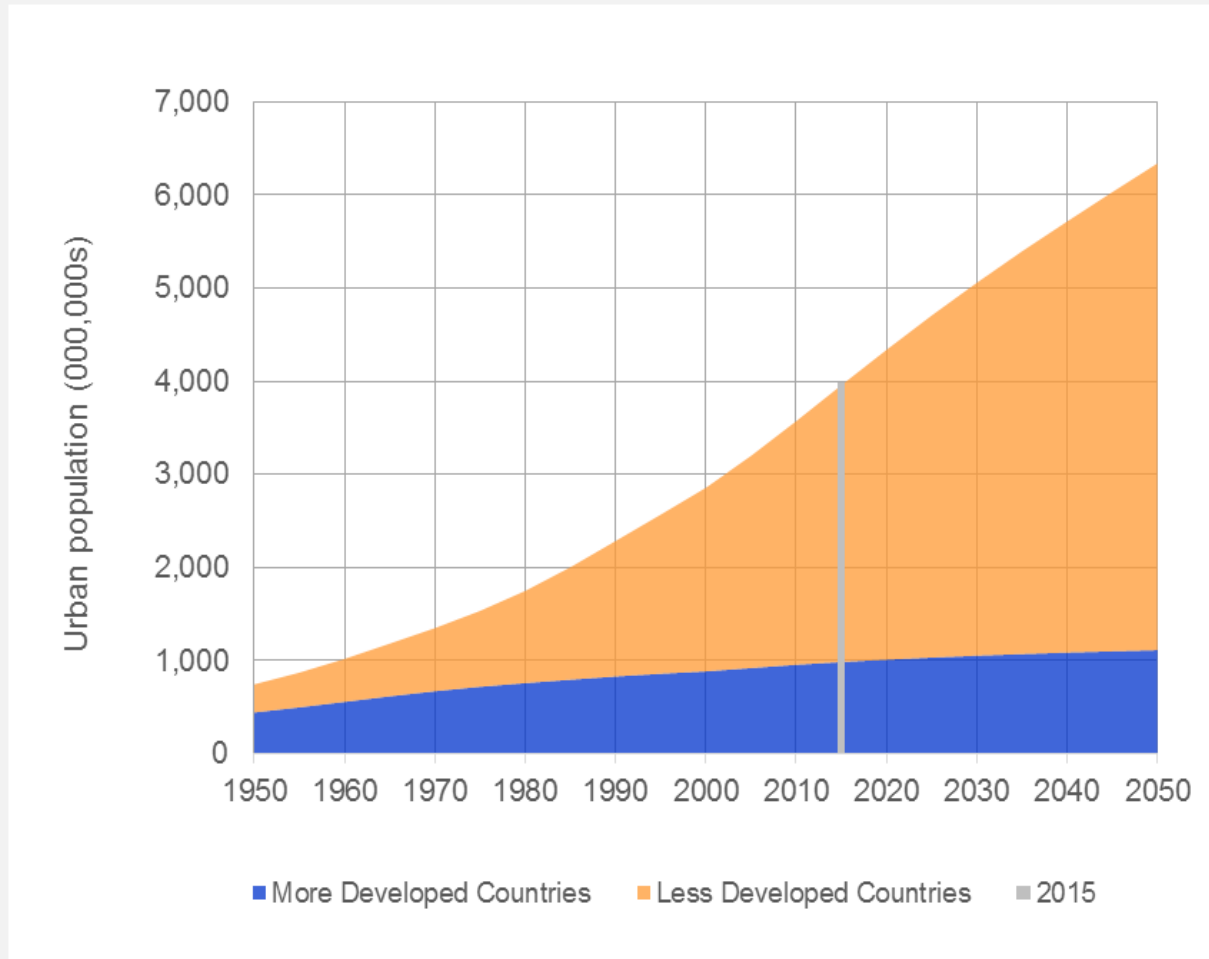


SDG	Name
1	No Poverty
2	Zero Hunger
3	Good Health and Well-Being
4	Quality Education
5	Gender Equality
6	Clean Water and Sanitation
7	Affordable and Clean Energy
8	Decent Work and Economic Growth
9	Industry, Innovation and Infrastructure
10	Reduced Inequalities
11	Sustainable Cities and Communities
12	Responsible Consumption and Production
13	Climate Action
14	Life Below Water
15	Life on Land
16	Peace, Justice and Strong Institutions
17	Partnerships for the Goals

UN Habitat World Urbanisation Prospects

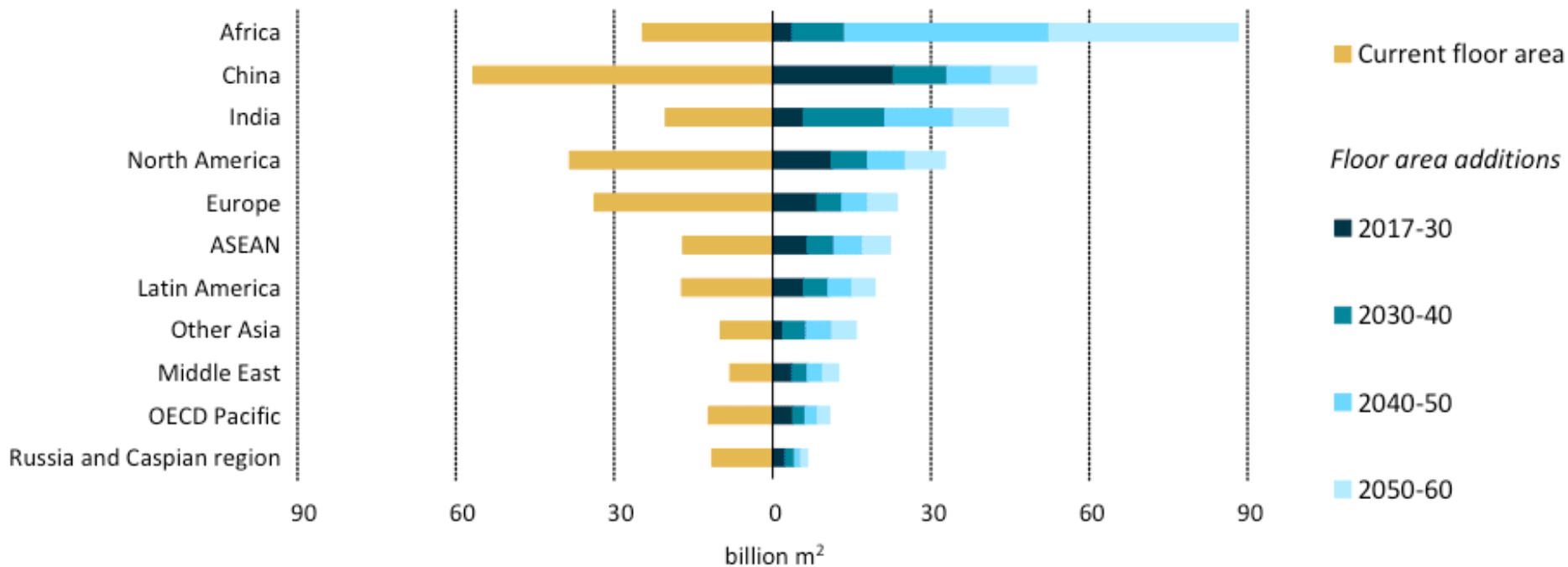


UN Habitat World Urbanisation Prospects



Between 2015 and 2050 the urban population in Less Developed Countries will increase by 2.35 billion, or 18 times the expected increase of 130 million in More Developed Countries. Source: NYU

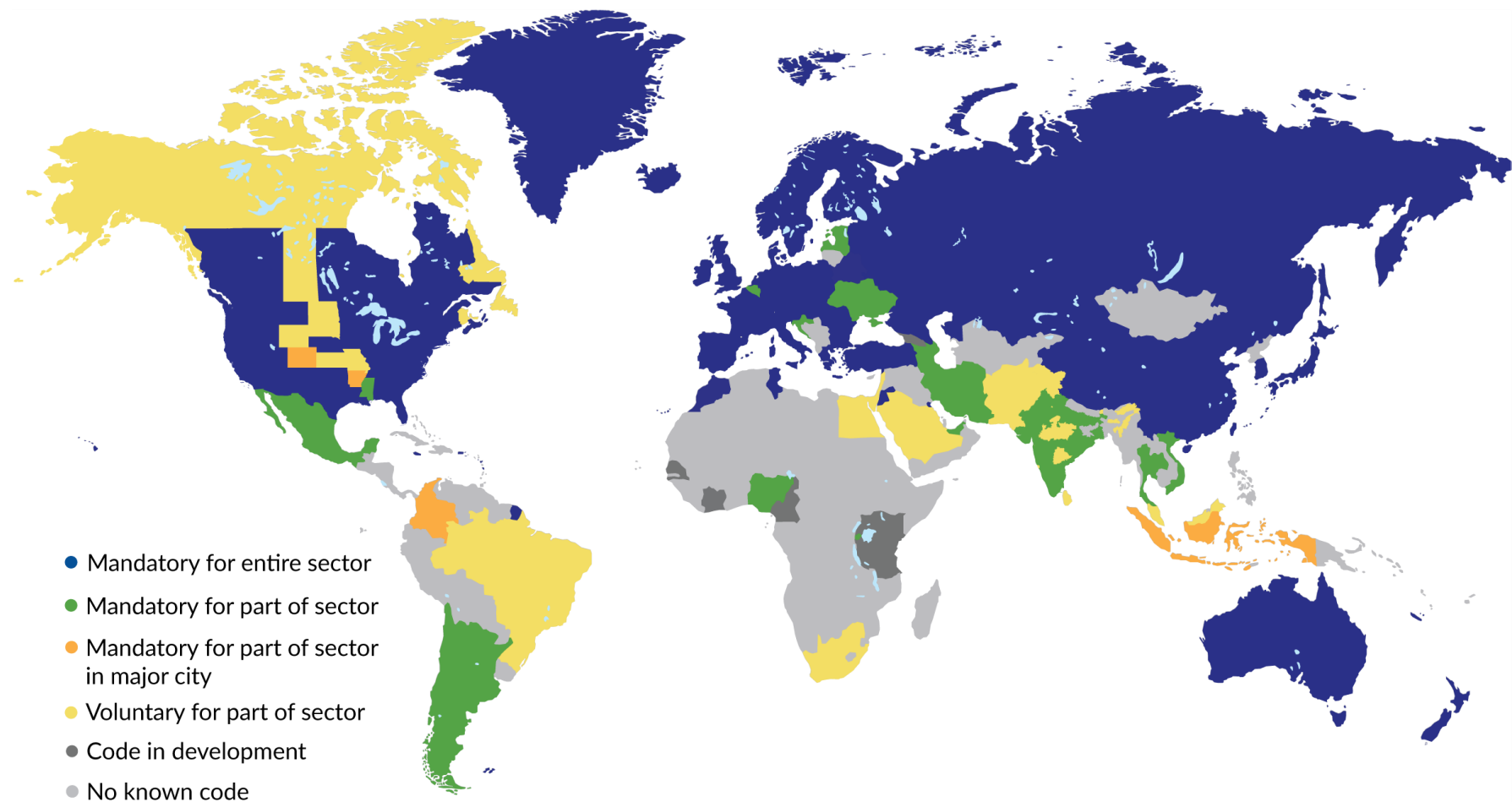
Floor area additions by 2060



Notes: OECD Pacific includes Australia, New Zealand, Japan and Korea; ASEAN = Association of Southeast Asian Nations.

Source: IEA (2017), *Energy Technology Perspectives 2017*, IEA/OECD, Paris, www.iea.org/etp.

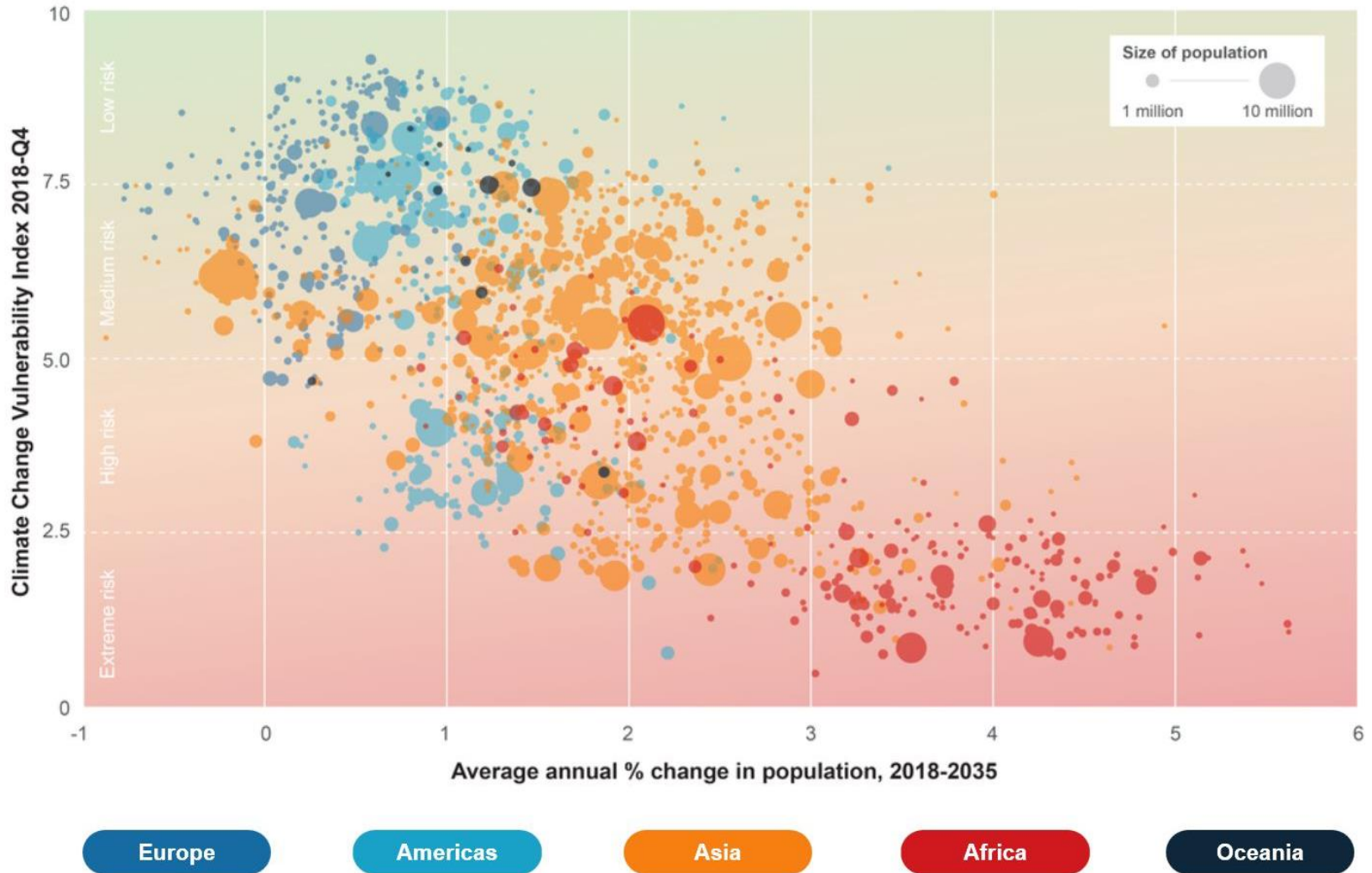
Building energy codes by country, 2018



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.

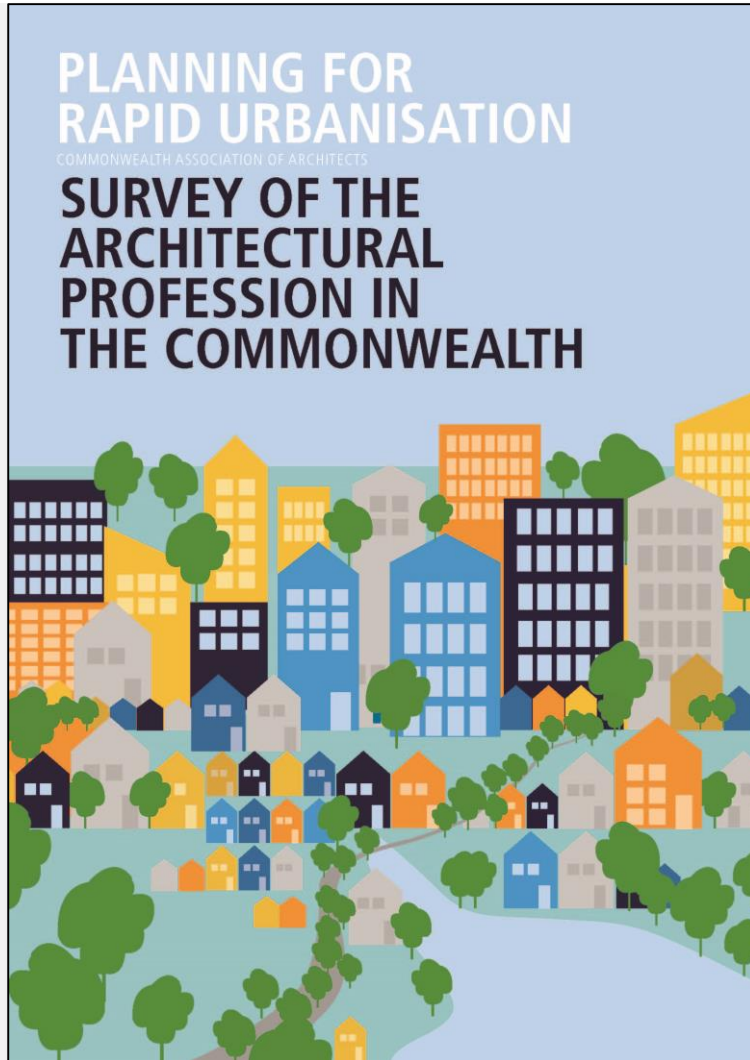
Source: International Energy Agency, March 2019

Climate Change Risk



Source: 'Climate Change Risks', Verisk Maplecroft 2018

CAA Survey of the architectural profession

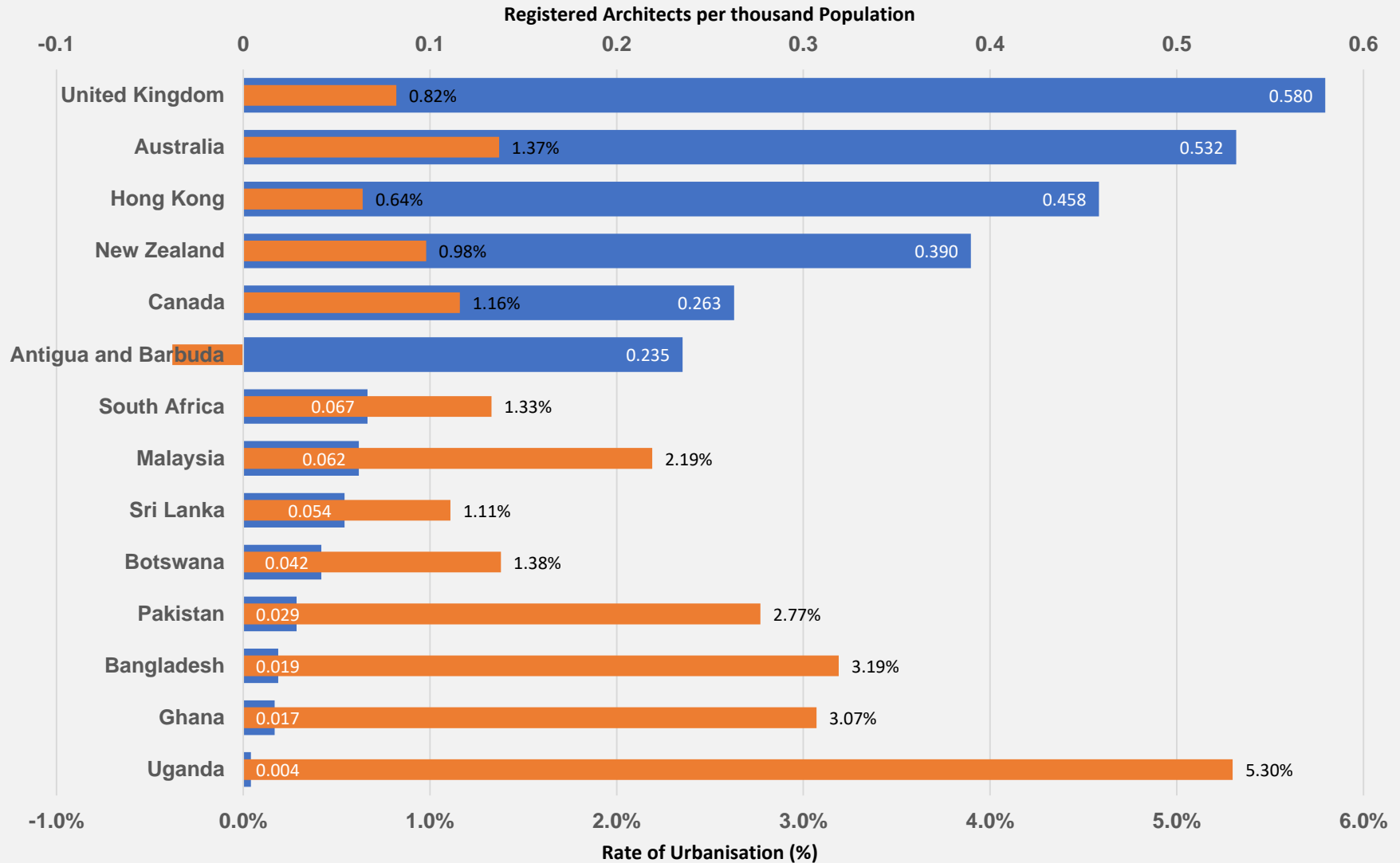


Survey respondents:

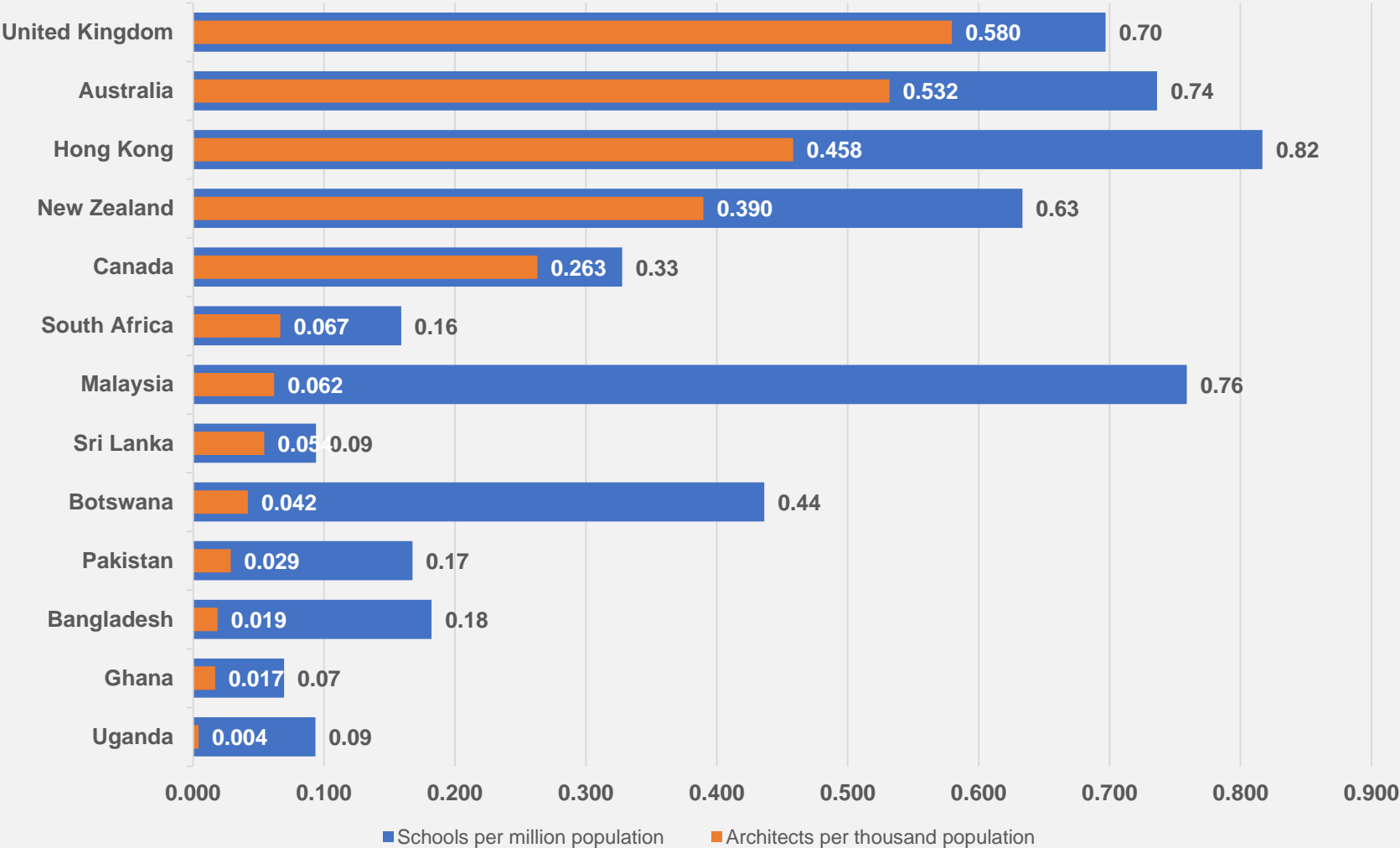
- **Africa**
Botswana, Ghana, South Africa and Uganda.
- **Asia**
Bangladesh, Hong Kong*, Malaysia, Pakistan and Sri Lanka
- **Caribbean and Americas**
Antigua and Barbuda and Canada
- **Europe**
Cyprus, Malta and the United Kingdom
- **Pacific**
Australia and New Zealand

*While Hong Kong is no longer part of the Commonwealth, the HKIA remains a member of the CAA

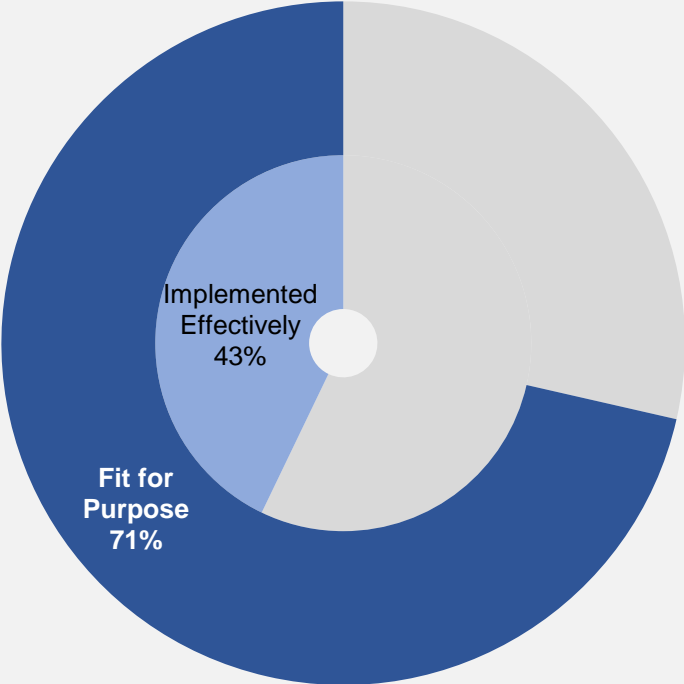
Architects and Urbanisation



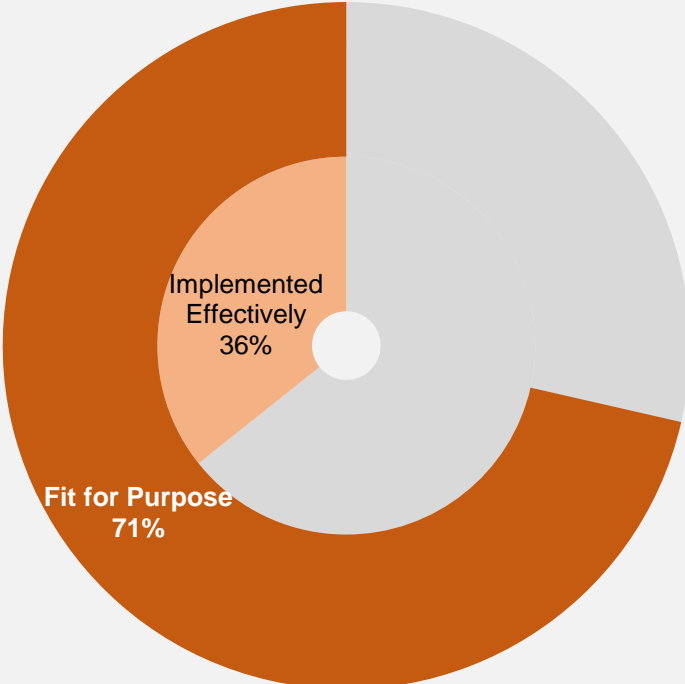
Schools of architecture



Built Environment Policy

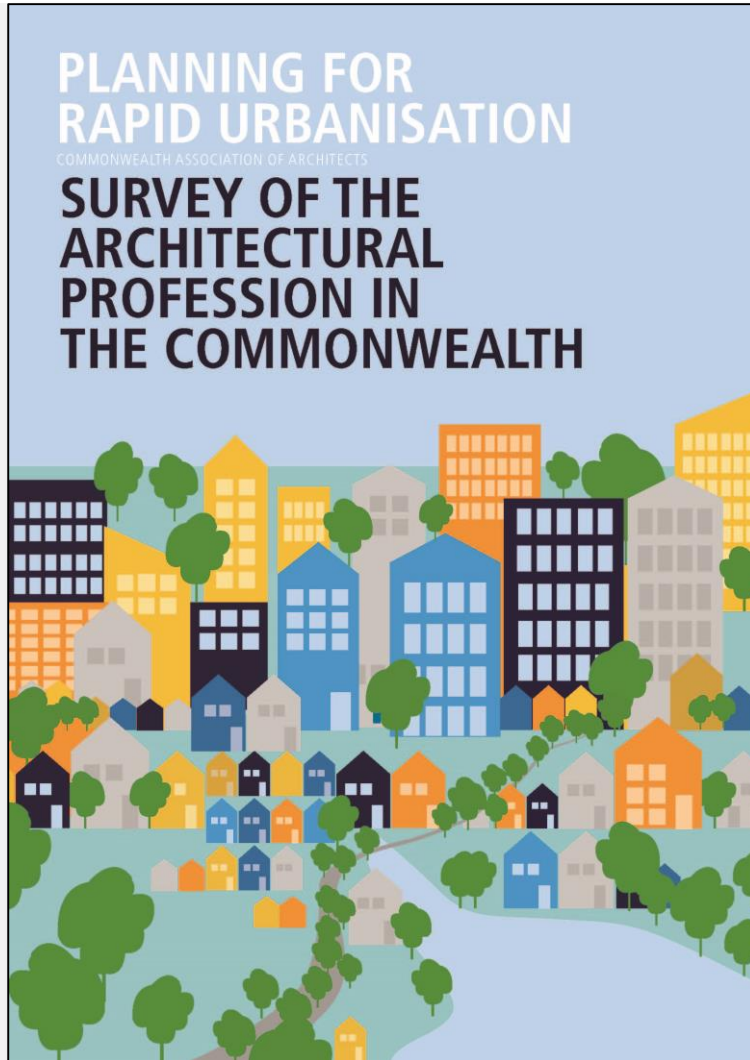


Planning Policy



Building Code

CAA Survey of the architectural profession



Key findings:

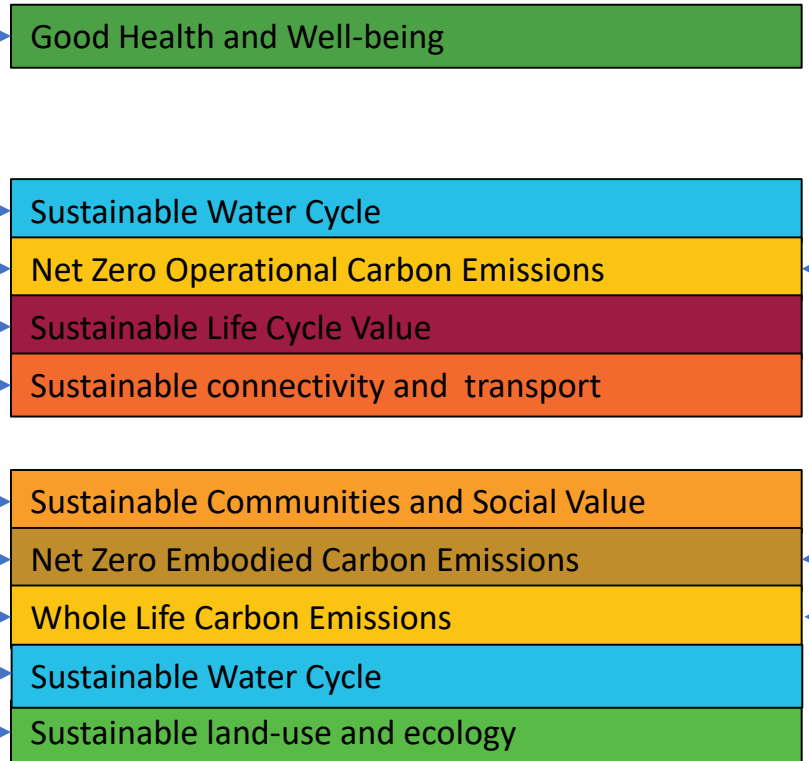
1. There is a **critical lack of capacity** in a number of Commonwealth countries, many of which are urbanising rapidly and are among the most vulnerable.
2. There is a corresponding **lack of educational and institutional capacity** to grow the profession fast enough in a number of Commonwealth countries.
3. There is a perceived **weakness in built environment policy** in many Commonwealth countries in terms of standards, implementation and enforcement.

*While Hong Kong is no longer part of the Commonwealth, the HKIA remains a member of the CAA

UN Sustainable Development Goals

	No Poverty
	Zero Hunger
	Good Health and Well-being
	Quality Education
	Gender Equality
	Clean water and sanitation
	Affordable clean energy
	Economic Growth
	Innovation and Infrastructure
	Reduced Inequality
	Sustainable cities and communities
	Responsible construction and production
	Climate Action
	Life below water
	Life on land
	Peace and Justice
	Partnerships and Goals

RIBA Sustainable Outcomes



RIBA Sustainable Plan of Work Overlay

	0 Strategic Definition	1 Preparation and Brief	2 Concept Design	3 Coordinated Design	4 Integrated Design	5 Manufacture and Assembly	6 Handover & Aftercare	7 In Use
Core Objectives	Client's key requirements defined.	Project feasibility confirmed and Project Brief defined.	Architectural concept prepared and Preliminary Engineering Information developed to define project spaces and outline systems, aligned to the Cost Plan and Project Strategies.	Architectural and engineering information Spatially Coordinated aligned to the Cost Plan and Project Strategies.	Architectural, engineering and specialist sub-contractor's technical design completed to assemble and construct the project.	Manufacturing, assembly and construction completed.	Project handed over, defects rectified and Aftercare completed.	Facilities and asset management. Post Occupancy Evaluation of building performance in use as required.
Outcomes	Goals	Strategy	Monitor & review				Validate & disseminate	Improve
Benchmarks, Certification and Lessons learned.	Options assessed. Legislative and statutory obligations defined. Review precedent. Post Occupancy Evaluation (POE) data from previous projects.	POE and precedent review used to define clear, deliverable and ambitious Performance, Benchmark and Certification Outcomes.	Consider benchmarking and QA requirements in initial design work. Begin process of statutory compliance.	Carry out certification and Interim Building regulation submissions.	Complete design stage sustainability assessment(s).	Complete construction stage information required for certification. QA process followed.	Confirm final certification. As-built energy model calibrated with commissioned building. Carry out Post Occupancy Evaluation.	Assist with ongoing re-certification measures where requested.
Sustainability	Strategic Sustainability aims defined.	Clear, ambitious and measurable outcomes for Climatic Design, Resilience, Operational Energy, Renewable Energy, Transport, Site & Operational Waste specified.	Stage 1 Sustainability Strategy integrated into the Concept Design.	Stage 2 Sustainability Strategy integrated into the design and reflected in Statutory submissions.	Stage 3 Sustainability Strategy integrated into the Technical Design drawings, specifications and technical information.	Construction progress is monitored and checked against the Sustainability Strategy.	Internal Environmental Outcomes included in building user guide.	POE data used to test the Sustainability Outcomes and lessons communicated to all project stakeholders. Outcomes published where appropriate. Monitoring data used to verify and resolve issues. Ongoing support role.
Internal Environment	Strategic Internal Environmental aims should be defined.	Clear, ambitious and measurable outcomes including Indoor Environmental Quality, Occupant Wellbeing and Controls specified.						
External Environment	Strategic External Environmental aims defined.	Clear, ambitious and measurable outcomes for Air and Noise Pollution, Water Use & Attenuation Rates and Biodiversity specified.						
Social and Economic	Strategic Social and Economic aims defined.	Clear, ambitious and measurable outcomes defined for Community involvement, Amenity contributions, Material Sourcing, Ethical Business and Labour Practices and opportunities for meanwhile use.						
Whole Life assessment	Clear and deliverable strategic Whole Life Cycle Assessment (WLCA) goals should be defined.	Scope of WLCA determined. Measurable outcomes for embodied and whole life carbon, recycled content and future proofing specified.	WLCA embedded in design process, including future flexibility, design life, durability, climate change, deconstruction and disposal.	WLCA used to assess relative carbon impacts of design options. Project information used to create baseline carbon budget.	WLCA used to inform specification, manufacture and supply decisions. Carbon budget updated and included in the specification.	Actual carbon impacts of the construction process monitored and reviewed against the carbon budget.	Final WLCA assessment compared to initial carbon budget to be included within J&M manuals.	POE should take into account life cycle impacts of services and fabric and maintenance and repair regimes.
Delivery	Goals	Strategy	Monitor & review				Validate & disseminate	Improve
	Approach to Operational and Handover Strategy defined.	Design team and client to prepare a comprehensive Operational and Handover Strategy. Sustainability Champions identified. Change Strategy agreed. Quality Assurance procedures set-out.	Intermediate audits of design against Sustainability Outcomes involve all stakeholders including design team and FM, building manager and user representatives. Sustainability Champions ensure implications on Sustainability Outcomes and corrective actions made explicate. Change Strategy considers impacts on sustainability outcomes.	Agree technical requirements for construction and operational phase monitoring strategies.	Check maintenance contracts, Operational and Handover Strategy and building user training are in place. Develop a plain English building user guide setting out the Sustainability Strategy.	Operational and Handover Strategy implemented. Building user guide issued to building users. Assist with fine tuning operational systems during commissioning.	Operational and Handover Strategy implemented. Building user guide issued to building users. Assist with fine tuning operational systems during commissioning.	Carry out any in-use services with reference to the Sustainability Strategy.
		Project Team appointments and procurement route tailored to sustainability outcomes. Include Quality Assurance and Post-Completion Services in each party's Schedule of Services.	Ensure the intended Sustainability Outcomes and Strategy for delivery are understood across the Project Team including the contractor, supply chain and any construction phase consultants.	Construction and manufacturing strategies have been developed with the contractor to deliver Sustainability Outcomes. Site monitoring plan agreed.	Audit site records against Sustainability Outcomes and Site Waste Management Plan. Sustainability Champion monitors progress.	Liaise with building occupiers, user or managers to deliver the as built Sustainability Strategy.	Client to consider long term aftercare and feedback strategy for monitoring and fine tuning of in use performance of the asset.	
Stage Outputs	Sustainability Strategy integrated into business case. Include Sustainability & Climate Change, Operation, Life Cycle, Ecology & Water, Quality Assurance and Post Occupancy Evaluation.	A site specific Sustainability Strategy is included in the initial project brief. Sustainability Outcomes are defined, ambitious and measurable. Team buy-in to objectives.	The concept design integrates the strategic sustainability principles and is verified against the Sustainability Outcomes. The evolved Sustainability Strategy is included in design reports.	Services, structural and architectural design are coordinated with the Sustainability Strategy which is included in statutory submissions.	The Sustainability Strategy and verified Sustainability Outcomes included in tender/contract documentation including specification, drawings and performance parameters.	Delivery, change and handover strategies aligned with the Sustainability Strategy. Interim testing and monitoring used to verify the Sustainability Outcomes.	Handover and commissioning includes induction and training of building users and managers with reference to the Sustainability Strategy. Post Occupancy Evaluation (POE) carried out to test delivery of as built Sustainability Outcomes.	POE derived lessons learned fed back to all stakeholders. Assist with performance in use improvements. Publish lessons learned if appropriate.

RIBA Sustainable Outcomes

Environmental Sustainability

Social Sustainability

Whole Life Net Carbon

Economic Sustainability

Outcome
Metric

Net Zero Operational Carbon

Net Zero Embodied Carbon

Sustainable Water Cycle

Sustainable Connectivity and Transport

Sustainable Land Use and

Good Health and Well-being

Sustainable Communities and Social Value

Sustainable Life Cycle Value

*Kwh/m2/y
kgCO2e/m2/y*

*TCO2e
Embodied*

*Litre/pp/y
Potable water*

*kgCO2e/km/per
occupant*

*Species added
Enhancement*

*Various
Metrics*

*Various
Metrics*

£/m2 value

Principles

1. Prioritise Fabric First principles for building form and envelope
2. Fine tune internal environment with energy sufficient mechanical systems
3. Provide responsive local controls
4. Specify ultra low energy appliances
5. Specify ultra low energy IT
6. Prioritise maximum use of onsite renewables appropriate to context
7. Demonstrate additionality of offsite renewables
8. Offset remaining carbon through recognized scheme

1. Prioritise building re-use
2. Prioritise ethical sourcing of low embodied carbon and healthy materials
3. Prioritise modular off-site construction systems
4. Promote use of local natural materials
5. Detailing to be Long life and robust
6. Design building for disassembly and the circular economy
7. Target Zero construction waste diverted to landfill
8. Carry out embodied carbon analysis of building elements.
9. Offset remaining carbon emissions through recognized scheme

1. Provide Low flow fittings and appliances
2. Provide Waterless appliances where possible
3. Provide Leak detection
4. Provide Rainwater and greywater recycling and attenuation but consider operational implications of complex systems
5. Provide on-site black water cleansing and recycling if viable
6. Create Sustainable Urban Drainage that supports natural aquatic habitats and human amenity

1. Create comprehensive green transport plan including digital connectivity
2. Prioritise high quality Digital Connectivity to avoid need for unnecessary travel
3. Prioritise site selection with good proximity to public transport
4. Provide high quality pedestrian links to local amenities
5. Provide high quality provision for Cyclists
6. Provide infrastructure for electric vehicles as a priority
7. Prioritise car sharing spaces
8. Provide suitable onsite personal storage

1. Prioritise Building and site re-use
2. Prioritise Brownfield site selection
3. Carry out sustainable remediation of site pollution
4. Retain existing natural features
5. Create mixed use development appropriate to local context
6. Create a range of green spaces
7. Create habitats that enhance bio-diversity
8. Create 'productive' landscapes for urban food production
9. Zero local pollution from the development

1. Design spaces with good indoor air quality using healthy materials
2. Provide spaces with strong visual connection to outside
3. Provide responsive local controls eg. opening window
4. Design spaces with appropriate occupant density for activity
5. Design spaces with good indoor daylighting
6. Design spaces with good adaptive thermal and humidity comfort
7. Design spaces with good acoustic comfort
8. Design spaces that are inclusive and universal accessible
9. Prioritise active circulation routes-eg

1. Prioritise placemaking that expresses identity and territory
2. Create secure places for privacy
3. Create places for social interaction
4. Create vibrant mixed use places
5. Provide high quality permeable links to social amenities
6. Provide High quality pedestrian public realm
7. Create inclusive Places for community interaction
8. Create Secure Places with overlooking

1. Align Capex with Opex budgets to allow whole life cycle approach
2. Carry out Soft Landings Graduated to Handover and aftercare
3. Measure energy costs
4. Measure management and maintenance costs
5. Measure overall running costs
6. Measure added value of occupant health and wellbeing
7. Measure added value of asset

*Performance Verification:
Publicly disclose energy in use and carbon emissions*

*Construction Verification:
Construction measurement and offset*

*Performance Verification:
Measure potable water usage in operation*

*Performance Verification:
Post Occupancy Evaluation occupant survey*

*Construction Verification:
Measure bio-diversity enhancement in operation*

*Performance Verification:
Post Occupancy Evaluation*

*Performance Verification:
Post Occupancy Evaluation*

*Performance Verification:
Measure operational running costs*

UN Sustainable Development Goals, 2030

