CLIMATE CHANGE ADAPTATION AND RESILIENCE

Climate-resilient infrastructure

Spotlight on the ICT sector

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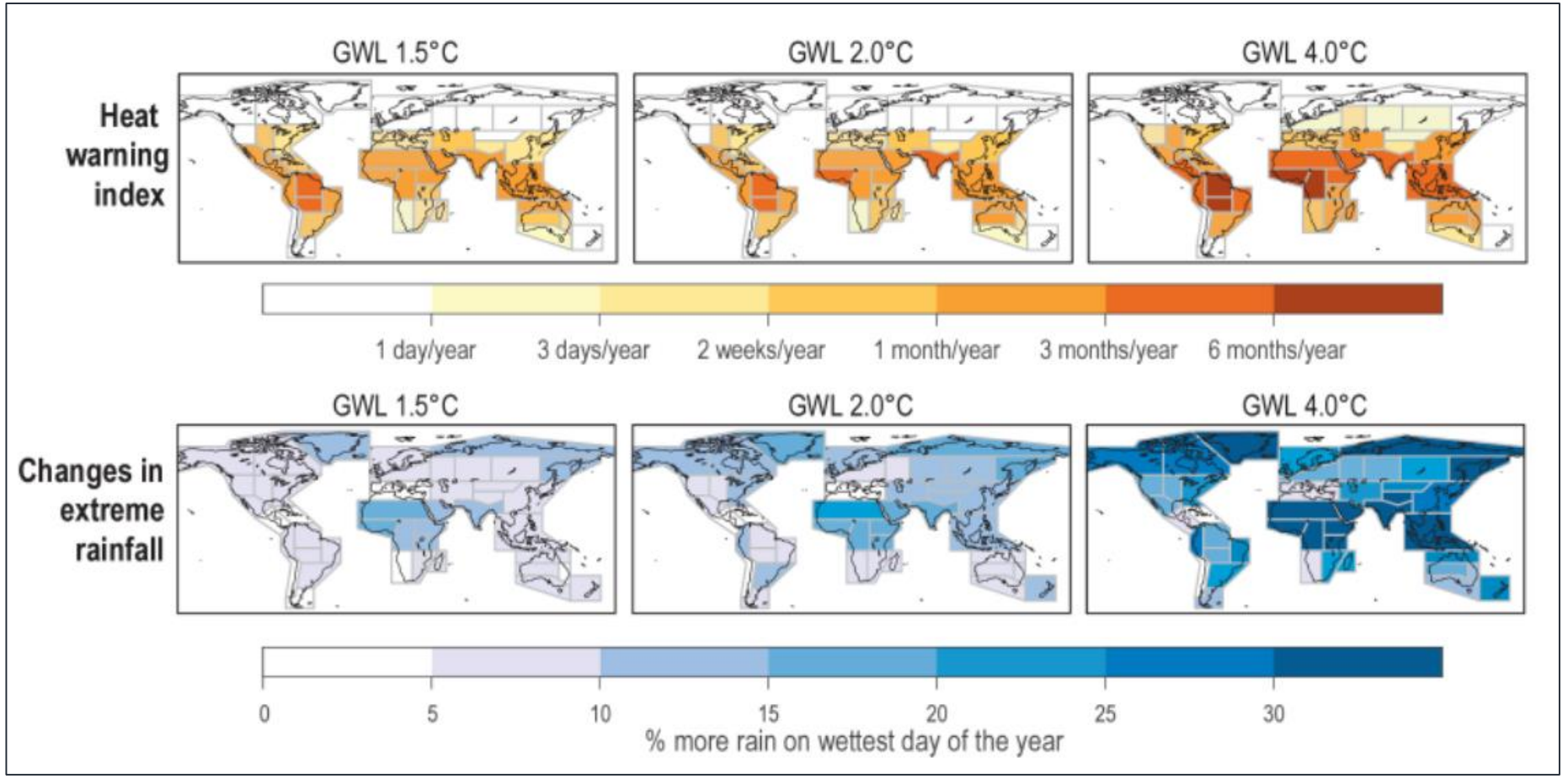
Globally: increasing climate-related extremes



Source: Intergovernmental Panel on Climate Change 6th Assessment Report, 2022

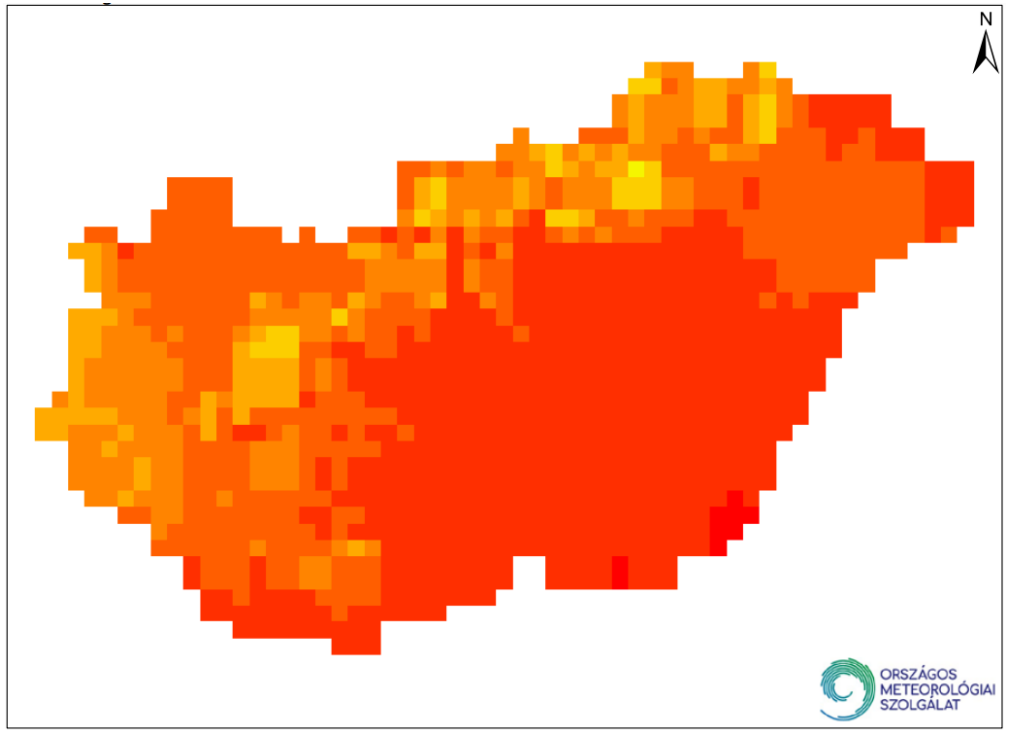
Hungary: increasing climate-related extremes

Observed changes in annual surface temperature in Hungary (°C) and linear regression

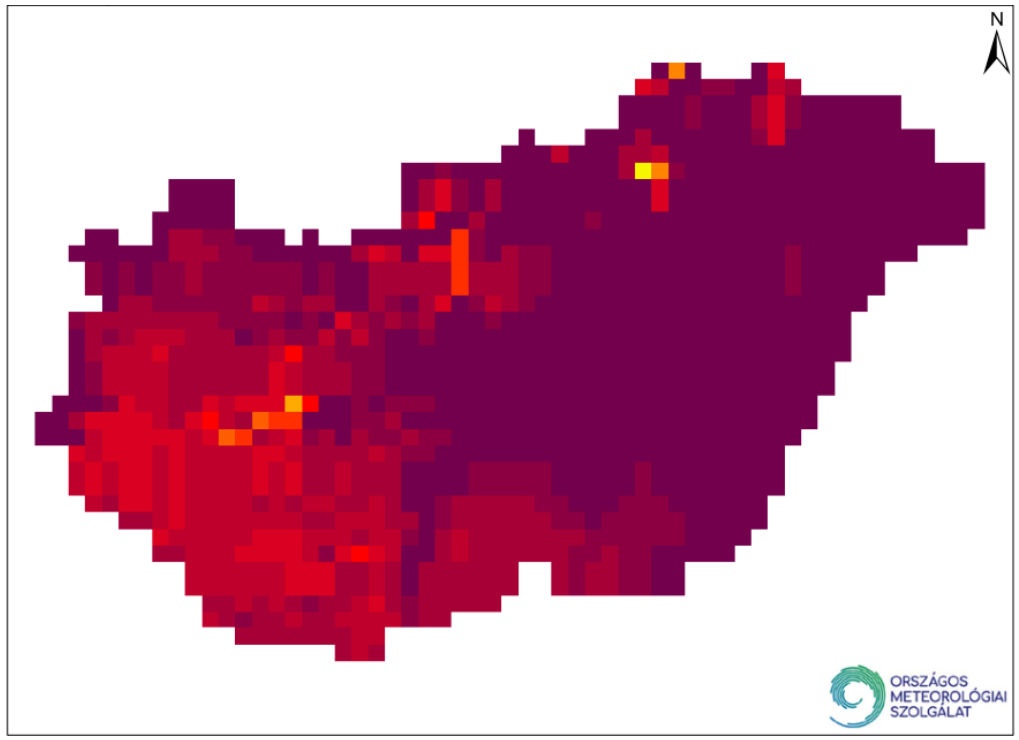
Source: IEA

Hungary: increasing climate-related extremes

Projected number of days with daily maximum temperature exceeding 30°C between 2021-2050



Minimum values (based on a combination of regional climate projections)



Maximum values (based on combination of regional climate projections)

Source: Hungarian Meteorological Service, KLIMADAT. Minimum and maximum values were calculated using two regional climate models based on moderate (RCP 4.5) and high (RCP 8.5) greenhouse gas emissions scenarios

Climate change impacts on infrastructure

Spotlight on the information and communication sector

- Hurricane Katrina, 2005, United States made more than 1,000 cellular sites fail. Hurricane Matthew, 2016, Bahamas: 63% of the total cost for replacing damaged infrastructure was in the telecommunications sector
- Wildfires, Australia, 2019-20: at least 36 mobile phone towers down
- Heatwave, 2022, United Kingdom: data centre outages due to overheating
- Floods, 2021, Germany: Took 2-4 weeks to restore mobile network services and 4 months to restore broadband connection
- Storms, 2023, Hungary: no internet in several areas after storm damages

Source: Unsplash

Examples of climate change impacts on the ICT sector in Hungary

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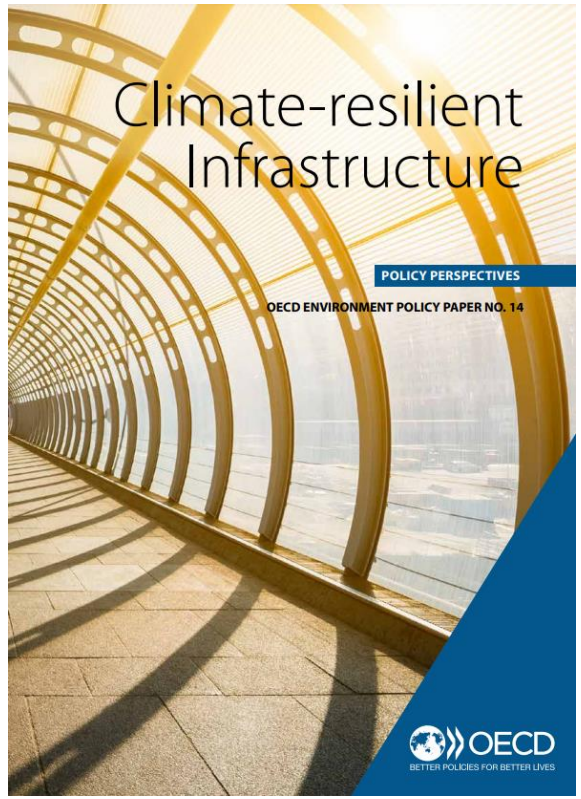
Climate hazard	Example of infrastructure impacts	Infrastucture degradation	Service availability	Service quality	Repair & recovery	Business costs	Health & safety
Extreme heat	Overheating of datacentres, exchanges, base stations		X		X	X	
	Increased heat exposure of workers (e.g. maintenance engineers and technicians)				X		X
Floods	Flooding of low lying infrastructure	X	X		X	X	
Extreme precipi-tation	Reduced quality of wireless service		X	X			
Storms	Lightning strike (damage to transmitters, masts, etc)	X	X	X	X	X	
	Changes in wind load damage to above ground transmission infra.	X	X	X	X	X	
Wildfires	Damage and/or destruction of lines, transmission poles, conductors	X	X		X	X	

Source: Based on Horrocks et. al. 2010

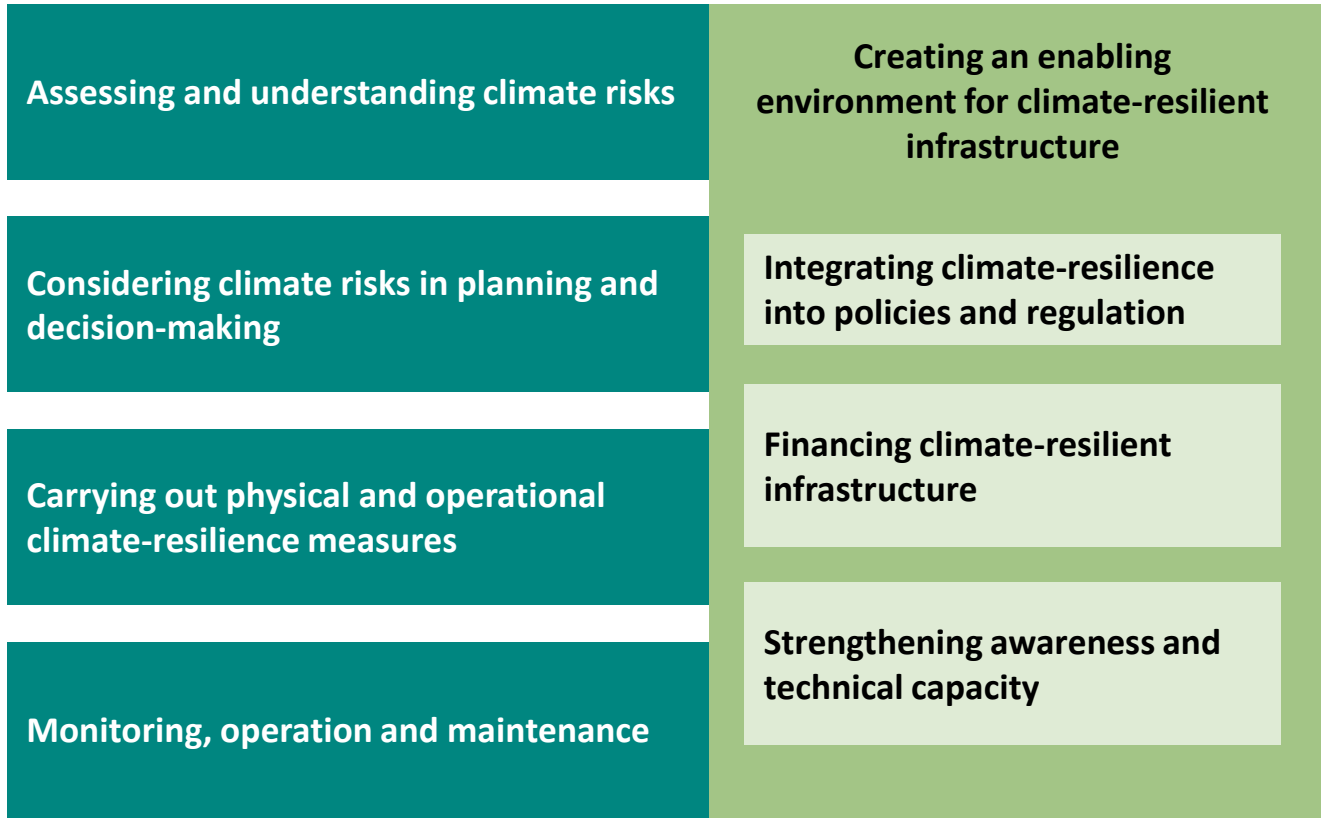
What is climate-resilient infrastructure?

- "Infrastructure that is planned, designed, constructed and operated in a way that anticipates, prepares for and adapts to the changing climate, while it can withstand and recover rapidly from disruptions caused by changing climatic conditions throughout their entire lifetime" (OECD, 2018)

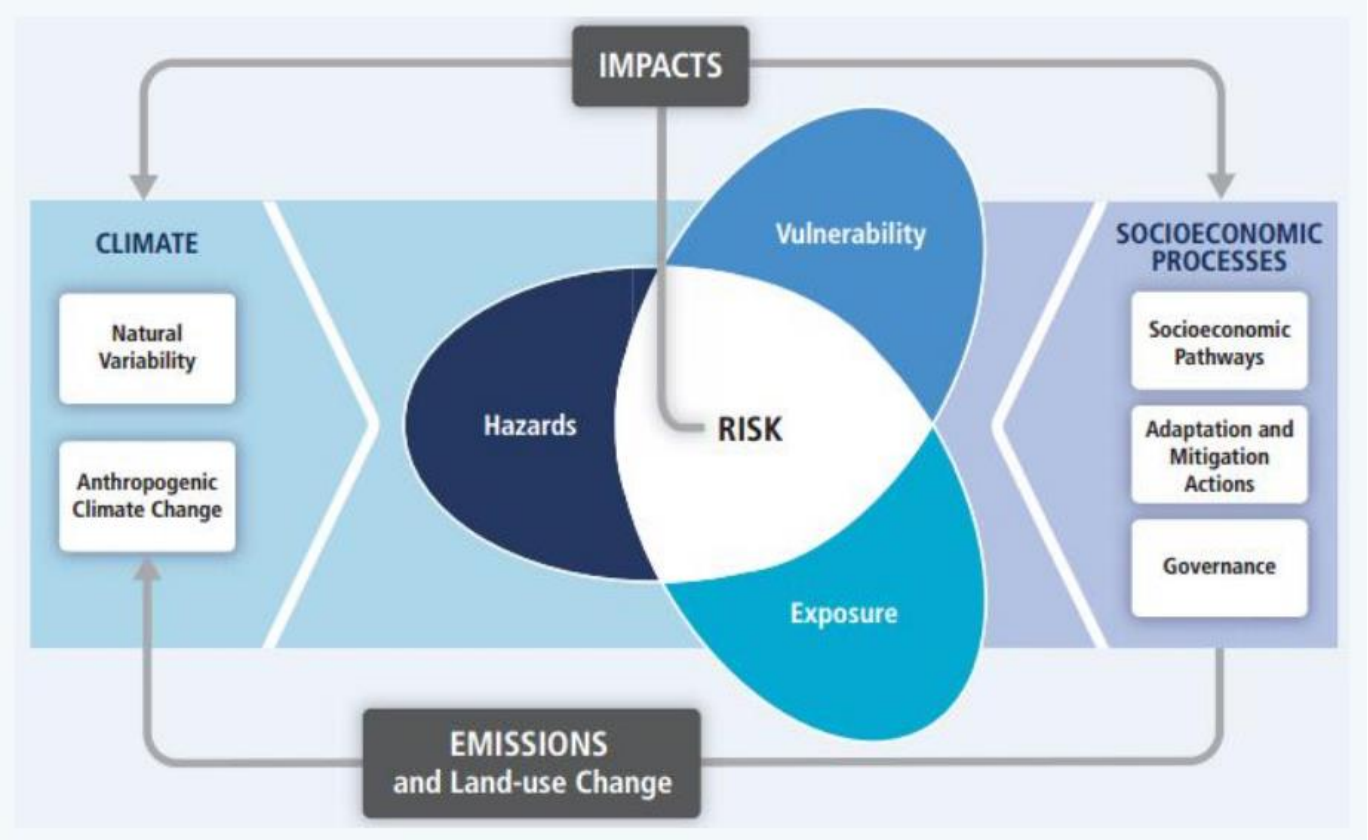
- It concerns both new assets and existing ones, which may need to be retrofitted or operated differently to best adapt to climate change impacts



What does climate-resilience building entail for the infrastructure sector?

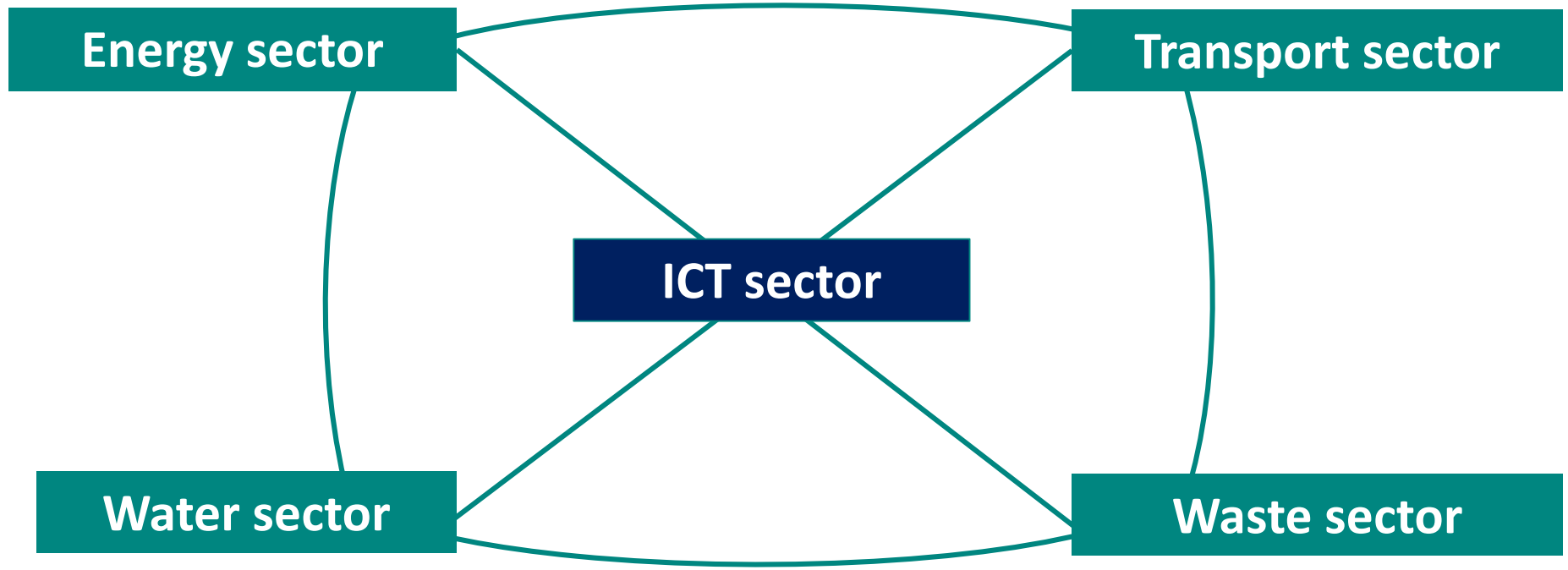


Assessing and understanding climate risks



Source: IPCC (2014): Fifth Assessment Report, Working Group 2, Chapter 19
AR5 Synthesis Report: Climate Change 2014 — IPCC

Interdependencies of the ICT sector with other infrastructure sectors

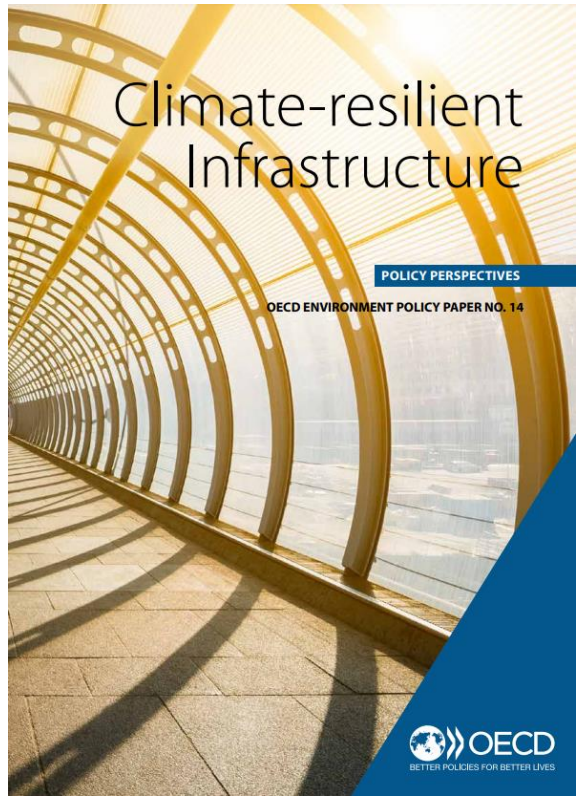


Source: Based on Horrocks et. al. 2010

Considering climate risks in planning and decision-making

- Once climate risks are assessed, ensure their consideration into planning, appraisal and decision-making processes ➔ Tools e.g. Environmental Impact Assessments (EIA)

- Manage decision-making under uncertainty related to climate change ➔ scenario planning, adaptive and flexible planning approaches



Carrying out physical and operational climate-resilience measures

- **Physical climate-resilience measures**: cooling data centres, manage vegetation around key assets to reduce wildfire risk, etc.
- **Operational climate-resilience measures**: changing land use, updating of infrastructure codes and standards, etc.

Source: Unsplash

Monitoring, operation and maintenance

- Monitoring infrastructure at regular and appropriate intervals
- Adaptive management and maintenance, based on the climate scenario materialising

Source: Unsplash

Creating an enabling environment for climate-resilient infrastructure

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Integrating climate-resilience into policies and regulation

Financing climate-resilient infrastructure

Strengthening awareness and technical capacity

Integrating climate-resilience into policies and regulation:

- National Adaptation Strategies and Plans can serve as entry points
- Incorporate climate-resilience into overall infrastructure strategies and sectoral strategies
- Adjusting regulations based on climate scenarios

Creating an enabling environment for climate-resilient infrastructure

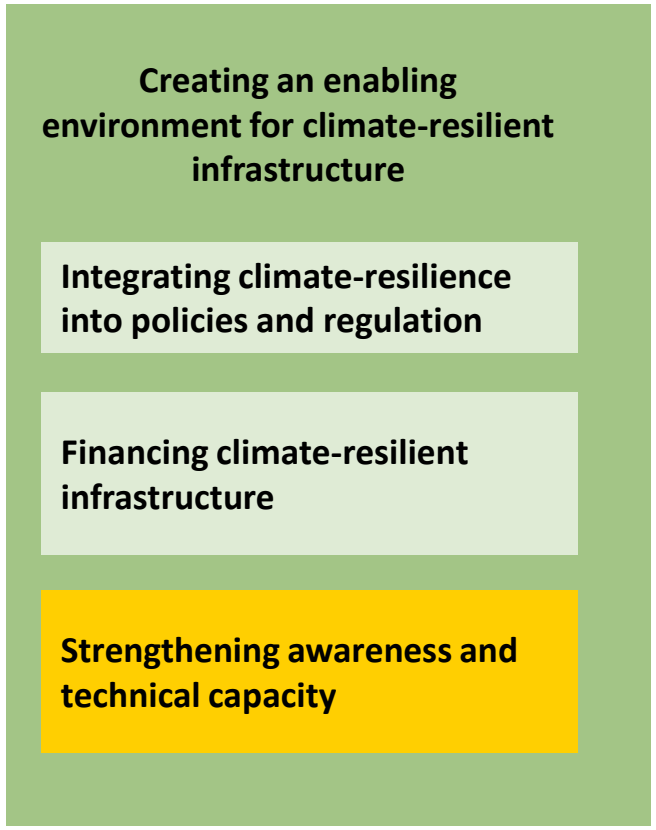
Creating an enabling environment for climate-resilient infrastructure

- Integrating climate-resilience into policies and regulation
- **Financing climate-resilient infrastructure**
- Strengthening awareness and technical capacity

Financing climate-resilient infrastructure:

- Climate impacts will increase the need for infrastructure investment
- Developing and communicating infrastructure plans can help investors identify investment opportunities
- Public procurement processes can support climate-resilience
- Lenders and public funders can use risk screening to identify infrastructure resilience needs
- Public finance can be used to mobilise private co-financing
- Disclosure of climate risks can encourage action

Creating an enabling environment for climate-resilient infrastructure



Strengthening awareness and technical capacity:

- Ensuring awareness among actors working across infrastructure pipelines (including infrastructure planners, designers and operators)
- Special skills are vital for climate-resilient infrastructure across the planning, appraisal, operation, monitoring and maintenance phases
- Training programmes, capacity building workshops, inclusion of climate-resilience into curricula is key

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For more information

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OECD Environment

OECD policy paper on climate-resilient infrastructure:

OECD Climate-resilience website:

Thank you!