



EmiratesGBC Technical Workshops

by Tenet

Climate risk management

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Climate change presents the main risk globally in the next 10 years¹

Climate-related risk assessment is crucial for business survival and success in a rapidly changing world

 **\$16**
million per hour


Global damage from extreme weather events in the past 20 years


 **\$12.5**
trillion

Projected global damage from climate change by 2050

According to The Global Risks Report (2023), the top-three global risks in the long term are:

1 
Failure to mitigate climate change

2 
Failure of climate-change adaptation

3 
Natural disasters and extreme weather events

Sources:

1. The Global Risks Report 2023;

2. [Climate change is costing the world \\$16 million per hour | World Economic Forum \(weforum.org\)](https://www.weforum.org)

UAE climate targets: key challenges

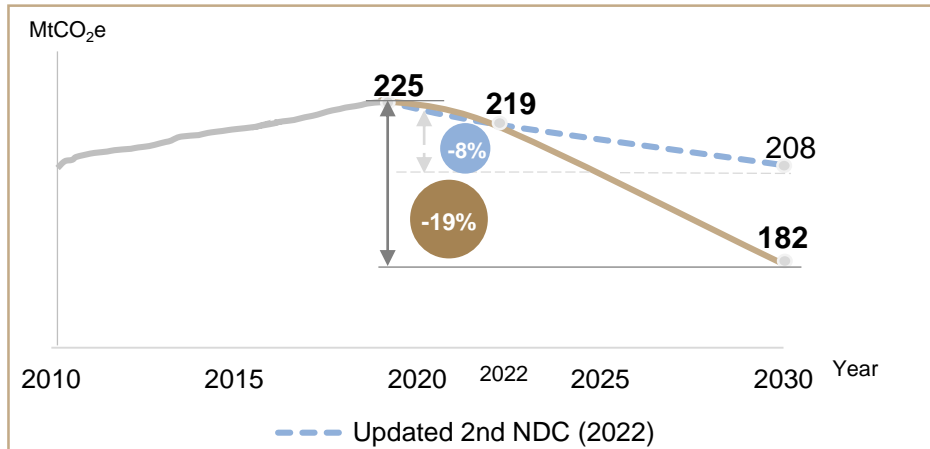
2030 national emissions reduction target



19% absolute GHG emissions reduction by 2030 vs. 2019



from **208 MtCO₂e*** to **182 MtCO₂e**
GHG emissions reduction target raised



*Announced in the Updated Second NDC 2022
Sources: Third Update of Second NDC for the UAE (2023), Statista Data

The UAE Government has set ambitious sectoral targets for GHG reductions

Sector	Percentage reduction target	2019 base year	2030 target year
Buildings emissions	-56%	62 MtCO ₂ e	27 MtCO ₂ e

Key socio-economic indicators for 2030



↑ **14%**

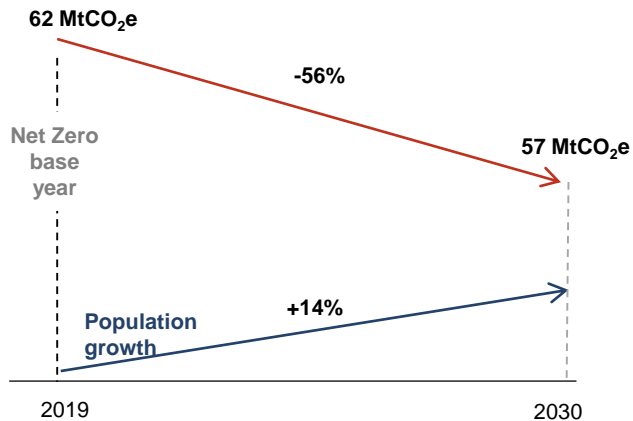
population growth (and, as a result, demand for new buildings)

Policy actions around climate change continue to evolve; these actions can pose varying levels of transition risk to organisations.

Construction

Net Zero Pathway sector

GHG emissions



This ambitious target (-56%) is based on the UAE's population being projected to go up by 14% from 2019 to 2030, a trend that will drive strong demand for new buildings.

Key targets

27% ↓

Rise in the penetration of district cooling in Dubai by 2030

30,000 ↓

buildings will be retrofitted in Dubai by 2030

40% ↓

reduction in energy use by 2050

20% ↓

reduction in water demand for the built environment by 2050

Technologies

- The UAE's **mixed-use developments**, such as Expo City, as well as existing districts, such as Masdar City in Abu Dhabi, exemplify the nation's move towards a low carbon building sector.
- For example, Expo City installed 5.5MW of **solar PV** on all buildings across the entire site and has 123 buildings with **Leadership in Energy and Environmental Design (LEED) certifications**, a **green building label** denoting healthy, efficient, carbon, and cost-saving green buildings.

Existing federal policy levers

UAE DSM programme

National roadmap to achieve net zero in the construction sector (to be developed)

Existing Emirate level policy levers

Dubai's Demand Side Management Strategy

Abu Dhabi's Demand Side Management and Energy Rationalisation Strategy 2030

Rafah Ras Al Khaimah's sustainable community guideline



Climate-related risks – global and local framework

Relevance of the climate-related risk assessment:



Investors

- Requirements for investors and exchanges in the Asia-Pacific region related to the disclosure of non-financial indicators by companies
- Requirements for the Asian Development Bank (ADB) (and other banks) related to the disclosure of information related to climate risks
- Stock exchanges such as the Abu Dhabi Securities Exchange (ADX) and Dubai Financial Market (DFM) have ESG requirements and recommendations for listing companies



Consumers

- Requirements for international companies as part of supply chain audits related to disclosing information on assessing their counterparties' climate-related risks



ESG-ratings and standards

- ESG rating requirements
- CDP
- The SEC's Climate Risk Disclosure Rule
- Ecovadis

Regulations:



Global

- IFRS S1 standard
- IFRS S2 standard
- CSRD



Local:

- **National Climate Change Plan of the UAE 2017–2050**
- **National Climate Change Adaptation Programme**
 - UAE Climate Risk Assessment & Adaptation Measures in Key Sectors/ Health, Energy, Infrastructure & Environment
 - Sectoral Climate Risk Assessment Framework
- **Principles for the effective management of climate-related financial risks** by the UAE Sustainable Finance Working Group

The impact of climate policy on business – why it's important to take action



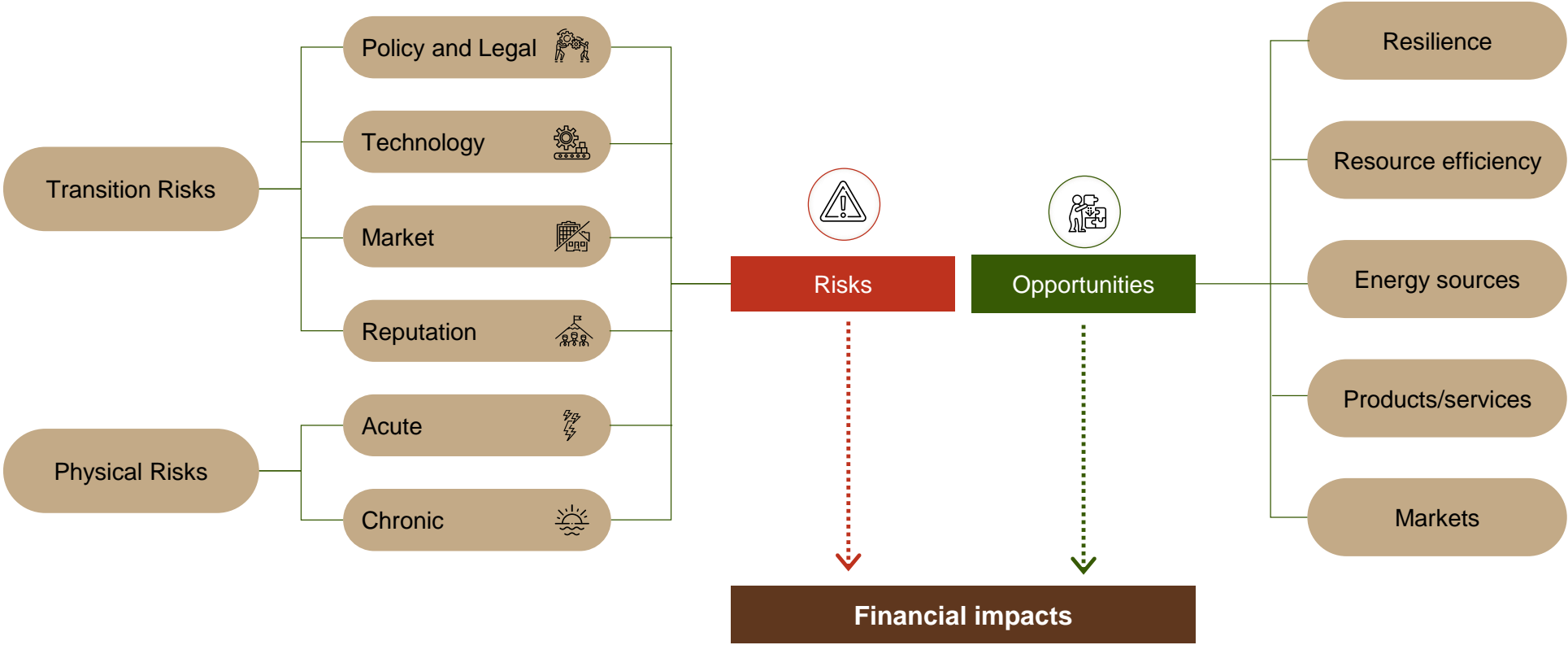
Reaching the UAE's climate targets will require concerted and coordinated efforts in key sectors of the economy, creating potential challenges but also opportunities for growth and sustainable practices

Why companies need to pay attention












- Regulatory measures
- Technologies
- Reputation and stakeholders
- Climate-related risks and opportunities



Climate-related risks, opportunities, and financial impacts



How climate-related risks can impact the construction industry

Risk factors	Examples of physical risks	Construction	Upkeep of buildings and asset management
Increase in the number of days with extreme temperature	Workers suffering from hyperthermia due to the heat		
	Additional costs to ventilate premises as a result of higher temperatures / air conditioning		
Increase in average annual temperature	Increased corrosion of exposed metal on buildings and structures from higher average annual temperatures		
Extreme precipitation	Interruptions to excavation works due to waterlogging of pits during extreme (in terms of intensity/duration) rainstorms		
	Interruption / stoppage of the production process due to interruptions in the supply of raw materials, fuel, materials caused by washout / flooding of road infrastructure		
Greater humidity	Increased corrosion to exposed metal parts on buildings and structures due to greater humidity		
Rise in sea levels	Partial / complete destruction of buildings and structures in coastal zones due to flooding		
Increased wind speeds	Disturbances to buildings and structures due to high winds		

How to avoid or minimise financial impacts caused by physical and transition risks

01

Identify relevant climate-related risk factors and risks

02

Assess their consequences quantitatively and/or qualitatively

03

Mitigate the impacts of climate-related risks or adapt existing processes to the characteristics of the risks



Opportunity: mitigation measures could be submitted as a climate project and carbon credits could be issued, which brings additional profit to company

Climate-related risk identification process

01

Identification



Ascertaining elements of the company's business processes that are vulnerable to the impact of climate-related risk factors

PHYSICAL RISKS

Ascertaining sensitive business process elements

infrastructure facilities personnel logistics operations

technological equipment and its operation modes

energy and water supply systems

Identifying types of impact of risk-factors on key elements of business processes

Stoppages/interruptions

Recovery costs

Increased resource intensity /reduced efficiency

Identifying risks based on the matrix of climate factors' impact on business processes

TRANSITION RISKS

Determining the level of detail of the analysed processes and selecting processes

Identifying risk-factors

Identifying the impact of risk-factors on the selected unit of detail

For non-financial institutions:

Upstream operations

Production processes

Downstream operations

For financial institutions:

Asset portfolio

Counterparties and customers

Deals

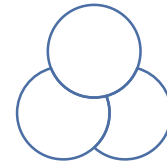
Determining the expected impact of the risk-factor on the organisation and establishing risk and risk events for selected time horizons

Climate modelling

Climate modelling

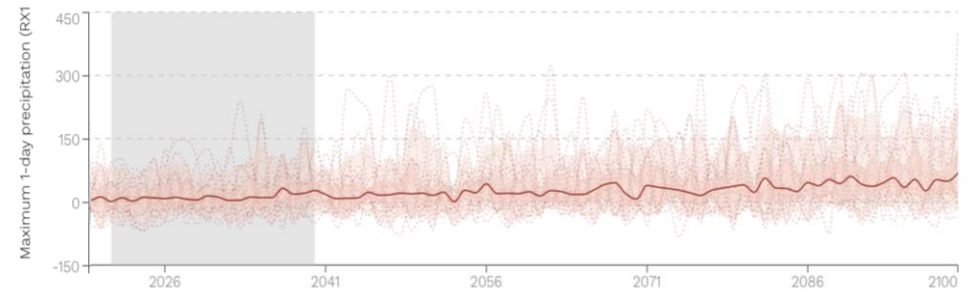
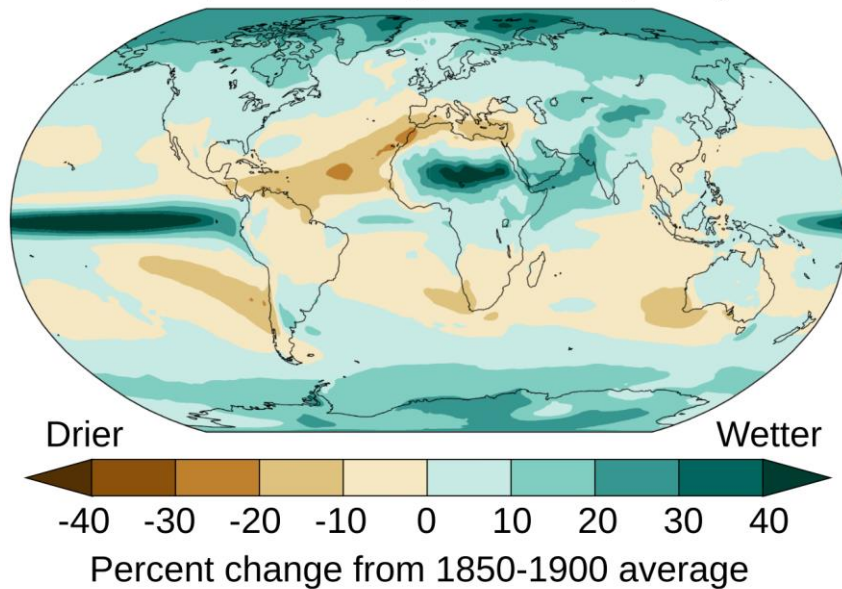
IPCC CMIP6

Models created as part of the CMIP6 international climate model comparison project provide an essential basis for the sixth climate assessment report from the United Nations Intergovernmental Panel on Climate Change (IPCC AR6).



CMIP6 comprises over **100 models** from **more than 50 modelling centres**

Precipitation changes at 2.0°C (3.6°F)

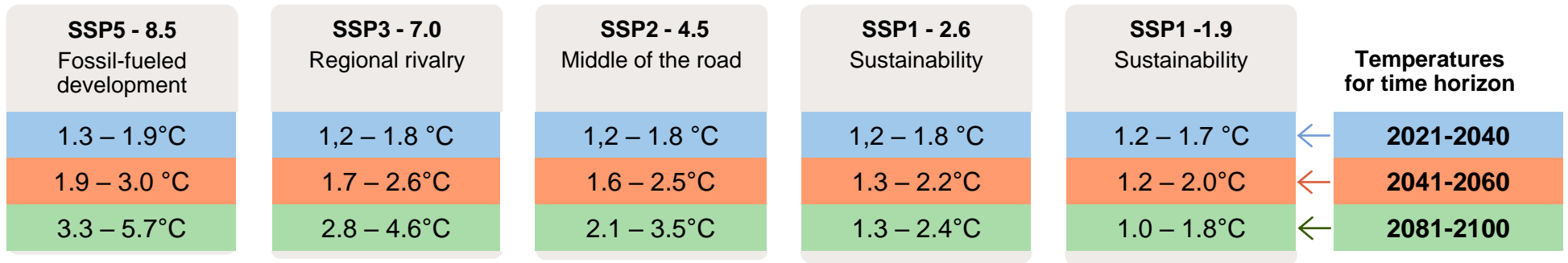


- 1 Global forecasting up until 2100
- 2 Low to high spatial resolution
- 3 Daily temporal resolution

Most commonly used scenarios – IPCC and IEA public scenarios

IPCC scenarios - for physical risk analysis

STRENGTHENING CARBON REGULATION AND ITS IMPACT ON BUSINESS



IEA scenarios - for transition risk analysis



Stated Policies Scenario (STEPS)

Reflects current policy settings based on a sector by-sector and country-by-country assessment of the energy-related policies that were in place by the end of August 2023, as well as those that are under development. The scenario also takes into account currently planned manufacturing capacities for clean energy technologies.



Announced Pledges Scenario (APS)

Assumes that all climate commitments made by governments and industries around the world by the end of August 2023, including Nationally Determined Contributions (NDCs) and longer-term net zero targets, as well as targets for access to electricity and clean cooking, will be met in full and on time.



Net Zero Emissions (NZE2050)

Sets out a pathway for the global energy sector to achieve net zero CO2 emissions by 2050. Does not rely on emissions reductions from outside the energy sector to achieve its goals. Universal access to electricity and clean cooking are achieved by 2030. The scenario was fully updated in 2023.

Climate-related risk assessment process

02

Assessment



Qualitative assessment

Assessing the likelihood and impact of risks

Information on comparable risk events and their consequences

Historical data and case studies

Preparing the risk register



Analyse the significance of physical risk trends, using selected climate models under selected scenarios, and analyse regulatory, market, reputational and technological trends at national and global level to analyse transition risks

Quantitative assessment

Preparing data for quantitative assessment

Preparing the simulation model

Quantitative assessments and updating the risk register.

We use various options to calculate risk indicators:

Scenario analysis

Stress-testing

Probabilistic modeling

Back-testing and model execution



Perform deterministic and probabilistic assessments of the impact of risks on the company's performance over different time horizons

Climate-related risk assessment

Climate change forecasting in the UAE



Historical measurement data

- Reanalysis
- Local weather measurements archive
- Satellite data



CMIP6 climate models

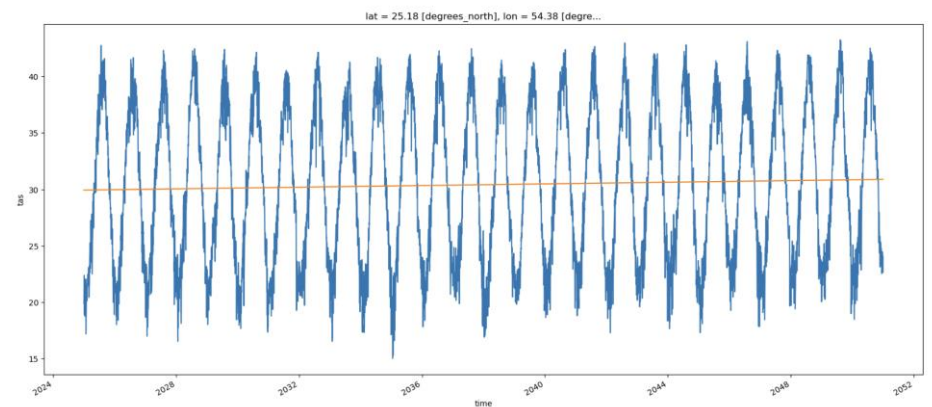
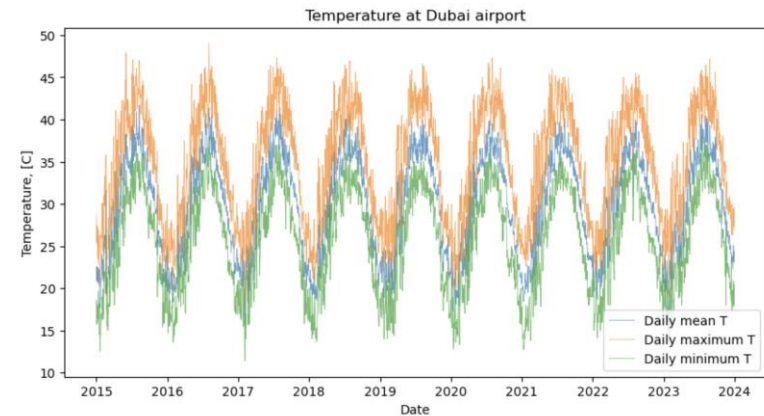
- Climate models best accounting local environment



Advanced methods for bias correction in models, based on historical data



Time series analysis and machine learning



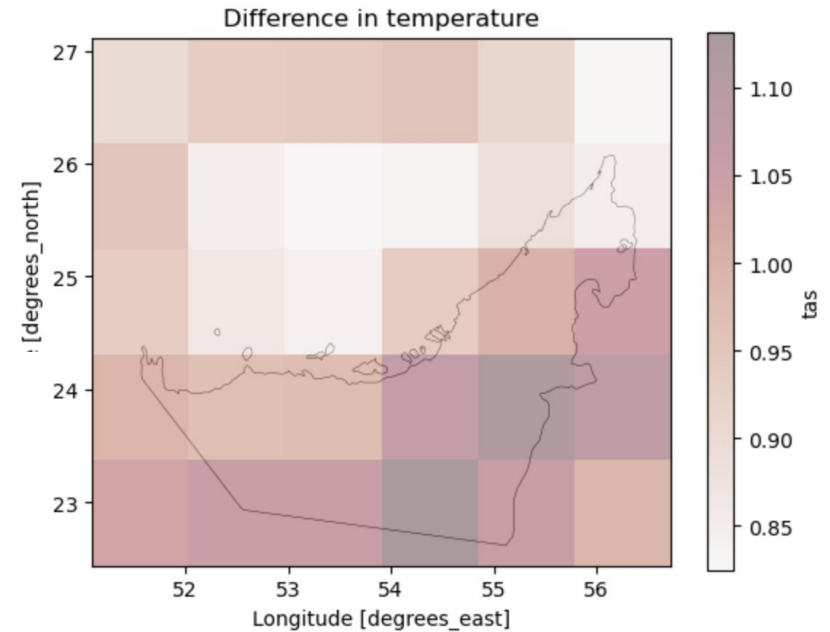
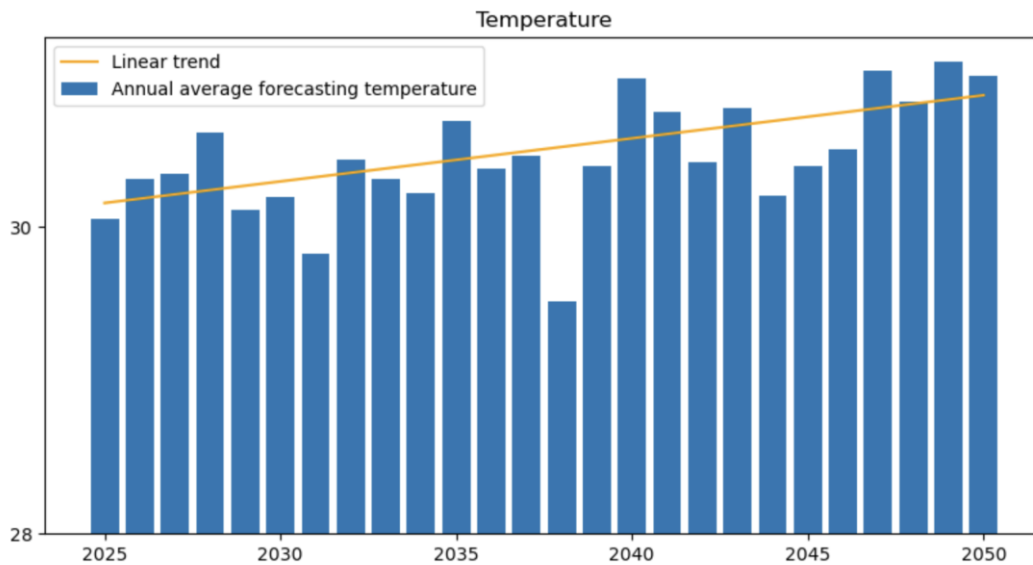
Climate-related risk assessment

Climate change forecasting in the UAE



Expected changes in climate risk-factors:

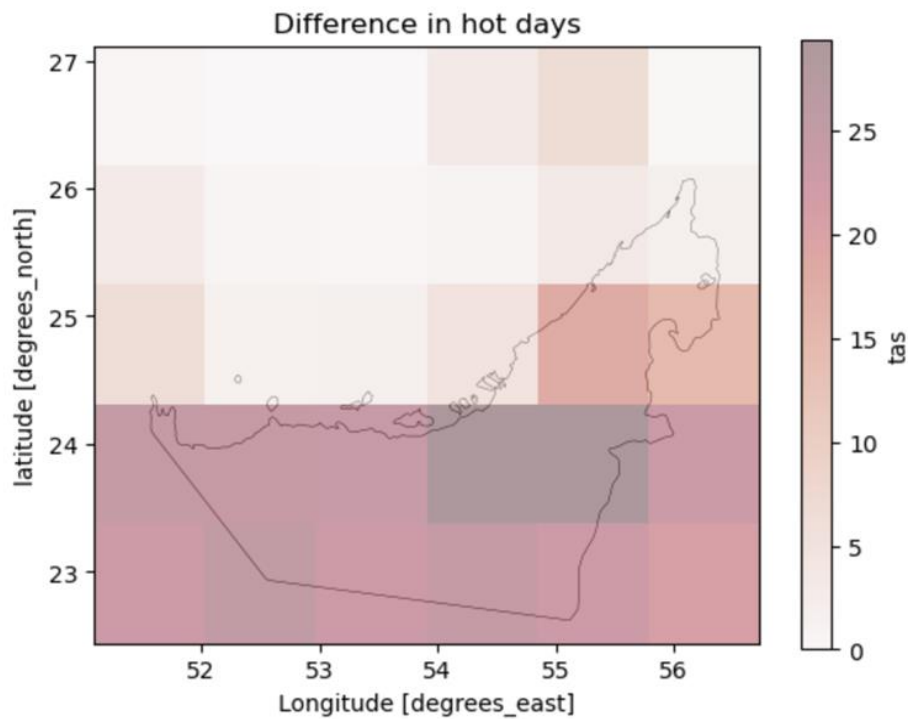
- Increasing annual temperatures
- Higher number of extremely hot days
- Rise in air humidity
- Extreme rainfall
- Increased frequency of dust storms
- Rises in sea levels



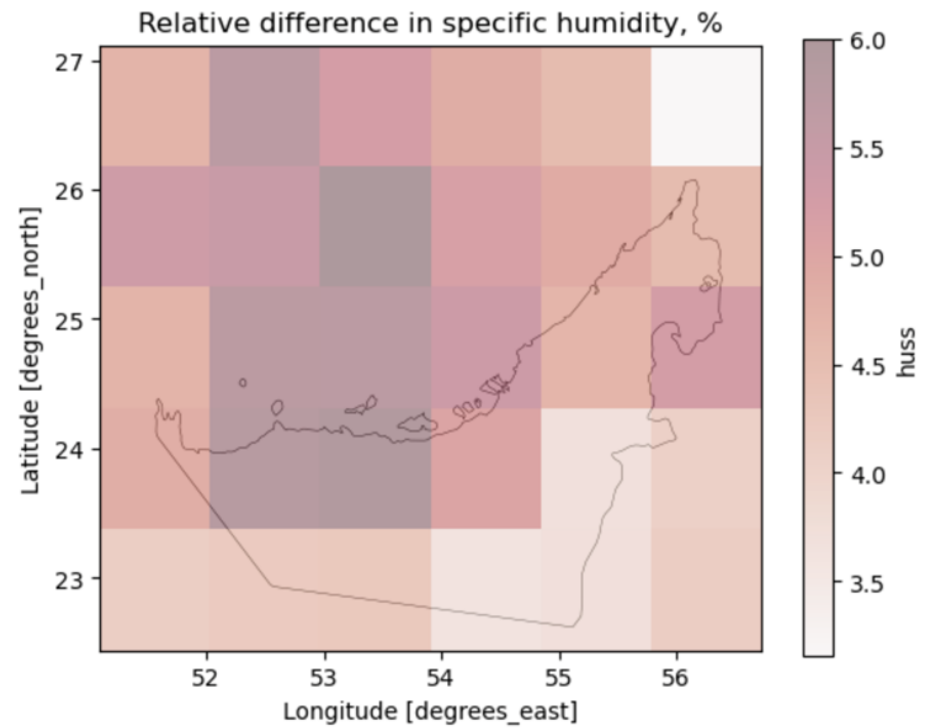
Climate-related risk assessment

Climate change forecasting in UAE

Higher number of extremely hot days



Rise in air humidity



Climate-related risk management process

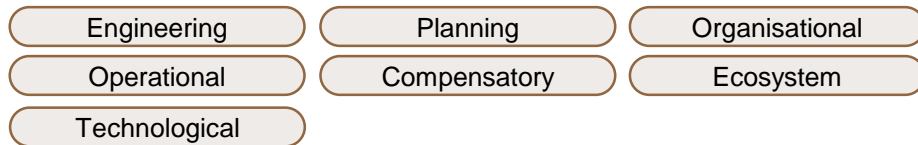
03

Elaborating mitigation and adaptation measures

Analysing adaptation capacity

Identify key metrics for climate change adaptation performance targets

Develop a list of measures



Determine the timeframe and costs of implementing measures

Qualitative assessment of residual risk

Prioritising and budgeting activities

! Analyse the adaptation potential, taking into account the measures implemented by the company; draw up a list of additional measures; and assess their impact on the company's performance

Efficiency assessments of mitigation and adaptation measures

Establishing performance criteria for climate change adaptation measures and the analysis of measures

degree of exposure to risk probability

degree of exposure to the consequences of risk materialisation

ratio of residual and acceptable risks

Monitoring the implementation of measures and the attainment of target values

Updating the climate change adaptation plan

! Evaluate the implemented measures and improve the list of measures

Examples of mitigation and adaptation measures

		EPC	Engineering	Developer	Manufacturer	Facility management
Extreme heat	Risks	<ul style="list-style-type: none"> - Workers health and safety - Decrease in productivity - Need for change in construction and engineering regulation and building codes 	<ul style="list-style-type: none"> - Mistakes and errors in design when using new technologies - Need for change in construction and engineering regulation and building codes 	<ul style="list-style-type: none"> - Project terms extension - Increase in project cost - Reengineering 	<ul style="list-style-type: none"> - Increase in R&D cost - Obsolete inventory 	<ul style="list-style-type: none"> - Increase in maintenance cost (HVAC equipment maintenance, energy consumption, irrigation costs)
	Opportunities	<ul style="list-style-type: none"> - Increase of contract price - Implementation of new production methods and new materials 	<ul style="list-style-type: none"> - Increase of engineering contract fees - Integration of new technologies 	<ul style="list-style-type: none"> - Climate resilient design - New marketing opportunities 	<ul style="list-style-type: none"> - New materials and solutions 	<ul style="list-style-type: none"> - Usage of thermal energy
	Mitigations and adaptations	<ul style="list-style-type: none"> - Rest hours - Cooling systems - Increased health control 	<ul style="list-style-type: none"> - Analysis and scouting new technologies and materials - Using more powerful HVAC and irrigation systems 	<ul style="list-style-type: none"> - Updated requirements for engineering and construction 	<ul style="list-style-type: none"> - Analysis, research and development 	<ul style="list-style-type: none"> - Updated requirements for design and construction - Use of additional energy sources (solar panels)
Carbon emissions regulation	Risks	<ul style="list-style-type: none"> - Additional cost for low emitting equipment and facilities - Increased energy cost 	<ul style="list-style-type: none"> - Mistakes and errors in design when using new technologies - Need for change in construction and engineering regulation and building codes 	<ul style="list-style-type: none"> - Additional cost for carbon emission - Design optimisation - Additional reporting 	<ul style="list-style-type: none"> - Additional cost for carbon emission - Increased energy cost 	<ul style="list-style-type: none"> - Additional cost for carbon emission - Increased energy cost - Increased maintenance cost
	Opportunities	<ul style="list-style-type: none"> - Energy efficiency - Waste management - Logistic optimization - Modular construction 	<ul style="list-style-type: none"> - Introduction of new technologies - Provision of more digital solutions 	<ul style="list-style-type: none"> - Potential to reduce emissions and submit climate project 	<ul style="list-style-type: none"> - Potential to reduce emissions and submit climate project - Supply chain optimisation 	<ul style="list-style-type: none"> - Waste management - Supply chain optimisation
	Mitigations and adaptations	<ul style="list-style-type: none"> - Digitalization, use of BIM & 3D modeling - Energy audit - Employee trainings 	<ul style="list-style-type: none"> - Updated requirements for engineering and construction - Analysis and scouting new technologies and materials 	<ul style="list-style-type: none"> - Updated requirements for engineering and construction - Sustainable certification 	<ul style="list-style-type: none"> - Carbon capture and storage - Energy audit 	<ul style="list-style-type: none"> - Sustainable certification - Energy management
Increase in humidity	Risks	<ul style="list-style-type: none"> - Increase of reclamations during guarantee period - Need for change in construction and engineering regulation and building codes 	<ul style="list-style-type: none"> - Mistakes and errors in design when using new technologies - Need for change in construction and engineering regulation and building codes 	<ul style="list-style-type: none"> - Decrease in materials lifetime - Need for reengineering (e.g. degradation systems etc) - Increase in project cost 	<ul style="list-style-type: none"> - Increase in R&D cost - Obsolete inventory 	<ul style="list-style-type: none"> - Increase in maintenance cost - Renovation in accordance with increased humidity rate - Updated requirements for design and construction
	Opportunities	<ul style="list-style-type: none"> - Project's timeline optimization for certain construction works 	<ul style="list-style-type: none"> - New technology implementation - Increase of engineering costs 	<ul style="list-style-type: none"> - Climate resilient design 	<ul style="list-style-type: none"> - New materials and solutions 	
	Mitigations and adaptations	<ul style="list-style-type: none"> - Use of waterproofing technologies 	<ul style="list-style-type: none"> - Updated requirements for engineering and construction - Development of sanitary measures 	<ul style="list-style-type: none"> - Updated requirements for engineering and construction 	<ul style="list-style-type: none"> - Analysis and research 	<ul style="list-style-type: none"> - Anti-mold materials and solutions

UAE climate legislation: recent changes

→ Cabinet resolution No.(67) of 2024 concerning the National Register for Carbon Credits

- The resolution is applied to **entities of huge carbon emissions that equal to or are more than 0.5 million tCO₂e annually** (Scope 1 & 2), and to **participating entities that reduce its emissions under 0.5 million metric tCO₂e annually** (Scope 1 & 2).
- The Entities of huge carbon emissions and the participating entities are required to have **greenhouse gases monitoring, reporting and verification system**;
- Measurement of GHG emissions is based on the **National System for Monitoring, Reporting and Verification** according to a **baseline designated at year 2019** or any other later date.
- **National Register For Carbon Credits** is being established;
- Carbon credits approval for carbon reduction and removal shall begin **starting from 2019**;
- **Trading platform for carbon credits** is being implemented.
- The process of reporting emissions shall use basic approved standards in **Greenhouse Gas Inventory Protocol, GHG emissions report shall be delivered annually**.
- Reports of GHG emissions reduction shall be audited **by the verification agency** according to **ISO 14065: 2021**.

→ Federal Decree-Law No. (11) of 2024 On the Reduction of Climate Change Effects

- The Cabinet of the UAE shall determine **annual targets for emission reduction for all sectors** at the national level in accordance with the **national pathway to climate neutrality**.
- The Ministry shall establish an **electronic system for emission measurement mechanisms**.
- The Ministry shall **approve the NDCs**, which shall be periodically reviewed.
- The Ministry shall issue a resolution regarding the **development of adaptation plans**, including **assessment of the main climate-related risks** in the sector, **measures of response to risks / identified early warning systems and implementation of the plan and adaptation measures**.

→ New climate change mitigation means

Improving energy efficiency

Using clean energy

Carbon sinks management

CCUS

Carbon offsetting projects

Integrated waste management

Using fluorocarbons alternatives

Other technologies or means

Sources: [Cabinet Resolution No. \(67\) of 2024](#), [Federal Decree-Law No. \(11\) of 2024](#).

Carbon offsetting project: an additional source of financing for decarbonization projects

Carbon offsetting project stands for activities that result in reducing the GHG emissions or increasing the GHG sinks and change the conditions specified in baseline scenario

Results of carbon offsetting projects are required for:

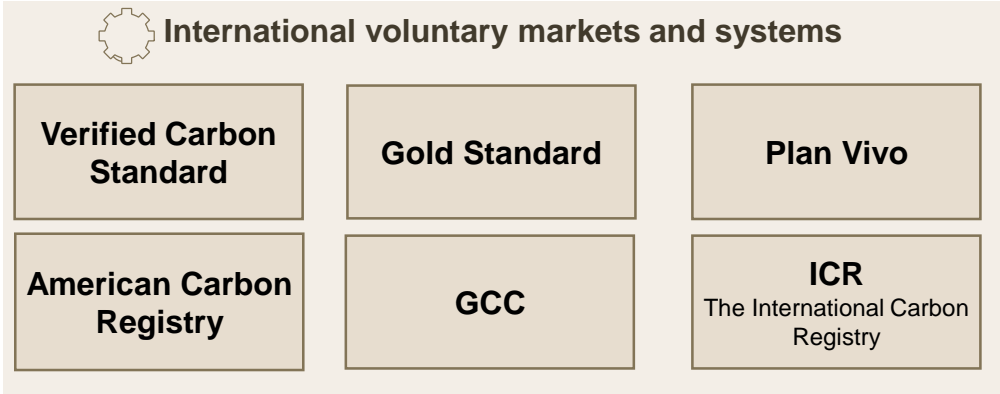
- ✓ Compensation of products / processes carbon intensity
- ✓ Fulfilment of GHG reduction commitments
- ✓ Marketing purposes
- ✓ Compliance with the best GHG emissions management practices

Total amount of issued CU, 2002–2023

National markets	0,7 billion CU
Voluntary markets (CAR, GS, VCS, GCC, Plan Vivo)	1,9 billion CU
International markets (CDM, JI, A6.2)	3,3 billion CU
Total	5,9 billion CU

National carbon markets by country

- Existing carbon markets of BRICS+ countries (Russia, China, South Africa, Saudi Arabia)
- ▨ Developing carbon markets of BRICS+ countries (Egypt, India, Brazil, UAE)
- BRICS+ countries without national carbon market (Iran, Ethiopia)
- Non-BRICS+ countries with national carbon markets



Sources: 1. Carbon Pricing Dashboard // The World Bank

www.tenetcons.com

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