



LOW-CARBON AND CLIMATE  
RESILIENT PATHWAY DEVELOPMENT OF THE  
CHEMICAL AND FERTILIZER SECTOR IN  
UZBEKISTAN

# Navoiyazot Climate Action Plan

EBRD PROJECT NR. 22022.006169  
DECEMBER 2023 (REV. 24 JANUARY 2024)



Sustainability is our business

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# Introduction

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# The action plan outlines key actions for UKS's subsidiary Navoiyazot to improve corporate climate governance and implement decarbonization technologies

- The European Bank for Reconstruction and Development (EBRD) is supporting UKS, a main player in the **Uzbek chemicals & fertiliser industry**, in the transition to a less carbon intensive business pathway
- To address this, they have engaged consultants ERM, Argus and GMC to develop a **Vision & Strategy for UKS** and an **Action Plan for Navoiyazot** covering actions to deliver
  - A **Vision & Strategy** setting out that UKS aims to achieve **net zero emissions by 2050** in line with the Paris Agreement
  - An **Action Plan** suggesting actions for Navoiyazot to **improve Corporate Climate Governance** and **implement greenhouse gas (GHG) emission abatement technologies** that are in line with the UKS Vision
- The project is divided in two phases:
  - **Phase 1:** Vision & Strategy for UKS – completed in August 2023
  - **Phase 2:** Action Plan for Navoiyazot – completion in December 2023

Phase 1: VISION & STRATEGY FOR UKS	
Scoping & Initial Diagnostic 1	Demand Forecast 2
Future New Business 3	Mitigation Pathways 4
Vision & Strategy 5	Capacity Building 6

Phase 2: ACTION PLAN FOR NAVOIYAZOT	
Corporate Climate Governance 7	Climate related Risks & Opps 8
Low Carbon Pathway 9	Disclosure Support 10
<b>Action Plan 11</b>	Capacity Building 12

# Corporate Climate Governance Action Plan

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# Corporate Climate Governance (CCG) Assessment Results (in line with TCFD recommendations)

ERM conducted a Gap Analysis for Navoiyazot through document review, a questionnaire and interviews with key internal stakeholders, following the EBRD Corporate Climate Governance (CCG) Assessment Matrix, EBRD Climate Governance for Companies Assessment Questionnaire and ERM's TCFD Readiness Tool. This slide includes a brief explanation about the scoring methodology and Navoiyazot's scoring results in each one of the four relevant areas (Governance, Strategy, Risk Management and Metrics & Targets).

## Methodology - in line with TCFD recommendations

Score	Description
	Meets all TCFD guidance, considered best-practice
	Meets some TCFD guidance
	Meets very few to no TCFD guidance

In line with TCFD recommendation, the assessment was conducted for each of the four TCFD pillars (Governance, Strategy, Risk Management and Metrics & Targets).

## Methodology - EBRD CCG Assessment Matrix

Score	Description
<b>Level 4</b>	Advanced CCG practices
<b>Level 3</b>	Good CCG practices
<b>Level 2</b>	Improvements towards good CCG
<b>Level 1</b>	No CCG practices
<b>Level 0</b>	No board, executive committee, no strategy and no risk functions, amongst others.

The CCG assessment matrix is drawn from TCFD recommendations, status reports, good market practices reports and case studies, review of other voluntary disclosure standards (e.g., CDP, CDSB, PRI, SASB), EBRD study on CCG (2018) and Corporate Governance standards (OECD and others). These have been adapted to the needs of companies from emerging countries allowing for a different level of maturity and gradual development of climate governance practices for companies.

# Corporate Climate Governance Assessment Results (in line with TCFD recommendations)

This slide includes key findings in relation to the status quo assessment and recommendations. In depth results can be found in the separate Gap Analysis report.

## TCFD pillars

	1. GOVERNANCE 	2. STRATEGY 	3. RISK MANAGEMENT 	4. METRICS & TARGETS 
<b>Current status of Navoiyazot</b>	<ul style="list-style-type: none"> <li>Well established and comprehensive governance and reporting structures around broader set of risks and not yet specific to climate.</li> <li>Good awareness around climate change and Navoiyazot's role in reducing GHG emissions.</li> </ul>	<ul style="list-style-type: none"> <li>Public mission statement including sustainability topics on the company's website.</li> <li>Strategic aims and objectives are defined in the framework of the policy of Navoiyazot in the Integrated Management System and include topics related to climate change (e.g. reduction of GHG emissions).</li> <li>Material climate-related risks and opportunities have been identified.</li> </ul>	<ul style="list-style-type: none"> <li>Robust risk management system and processes based on the Integrated Management System (IMS) in place.</li> <li>Several physical and transition risks included in risk register.</li> <li>Good communication between production level executives and IMS risk management department.</li> </ul>	<ul style="list-style-type: none"> <li>Some metrics and targets (e.g. around energy and water use, as well as air emission metrics) are in place.</li> </ul>
<b>Key recommendations</b>	<ul style="list-style-type: none"> <li><b>Include climate - related risk management topics in the agenda of Board meetings.</b></li> <li>Regular capacity building training for management and employees on ESG and climate.</li> <li>Prepare <b>internal climate policy with clearly allocated responsibilities and accountability</b> around climate change risk management signed by senior management.</li> </ul>	<ul style="list-style-type: none"> <li>Consider future climate risks (physical and transition) in the company's strategy for different time frames (short, medium, long-term).</li> <li>Conduct financial quantification for physical and transition risks.</li> <li>Conduct climate risk and opportunity assessment also the supply chain and future investment projects.</li> </ul>	<ul style="list-style-type: none"> <li>Add a full list of material climate risks (physical and transition) to the existing risk register, risk identification and management procedures.</li> <li>Develop risk mitigation and adaptation plans for assets and at company level.</li> </ul>	<ul style="list-style-type: none"> <li>Continue improving measurement of metrics like GHG Emissions, energy consumption and energy intensity.</li> <li>Based on the analysis of climate-related risks and opportunity and scenario analysis, define metrics which will be used to track and manage these identified risk (e.g. energy use, water use, GHG emissions, investments /expenditures for low carbon alternatives, etc.).</li> </ul>

ERM has found that Navoiyazot has well established processes & management and risk management structures where climate topics can be integrated.

# Corporate Climate Governance (CCG) Assessment Results - EBRD CCG Assessment Matrix

## Section A 1. BOARD OVERSIGHT FOR CLIMATE

Question*	EBRD CCG Matrix answer	Maturity Level	Opportunity for improvement – Action Plan item	Short Term (2023-2025) / Long Term (2023-2050)
Q1, Q2	Q1. The company has a Supervisory board and a Management board. Q2.a The company has a board but no oversight or accountability of sustainability/ESG and climate-related risks and opportunities.	Level 1	<ul style="list-style-type: none"> <li>• Include climate change topics into the areas of responsibility of the Supervisory Board and Management Board and update the governing documents which describe responsibilities of the management bodies of Navoiyazot (such as for example Articles of Association).</li> <li>• Prepare an internal Climate Policy or a statement signed by a member of executive management (e.g. Chairperson of the Management Board), as best practice. The policy should include the vision, goals, actions, roles of different functions in climate change risk management.</li> </ul>	2023-2025  2023-2025
Q3	Q3.b The company's board and/or board committees are informed about climate-related issues on an ad hoc basis.	Level 2	<ul style="list-style-type: none"> <li>• Include climate change and ESG risk management topics to the agenda for the meetings of the Supervisory and Management Board meetings. Include climate change topics into the Management Board and Supervisory Board's discussions on strategy, business plans, annual budgets, performance objectives, capital expenditures, acquisitions and divestitures, risk management policies. Include climate-related topics in the agenda of the Navoiyazot's / UKS's ESG Working Group meetings.</li> <li>• Strengthen collaboration of the existing ESG working group with Management Board: introduce a process and frequency of reporting on climate change topics.</li> </ul>	2023-2025  2023-2025
Q4	Q4.b Accountability by senior executive management and operations is reflected by way of regular submission of reports and explanations to the board. This may include sustainability/ESG matters but does not explicitly cover climate-related risks and opportunities.	Level 2	<ul style="list-style-type: none"> <li>• Include climate-related topics in the agenda of the Navoiyazot's / UKS's ESG Working Group meetings.</li> <li>• Introduce a procedure on how the Management Board and Supervisory Board monitors and oversees progress against goals and targets for addressing climate related issues.</li> </ul>	2023-2025  2023-2050
Q5	Q5.b The board members possess some technical and regulatory knowledge and the company provides limited capacity building on sustainability/ ESG matters and climate-related issues on an ad hoc basis.	Level 2	<ul style="list-style-type: none"> <li>• Regular (recommended annually) capacity building training for management on ESG and climate topics (and comprehensive climate training for employees).</li> </ul>	2023-2025
Q6	Q6.c The company takes measures to develop and enhance the executive management's collective knowledge of and resources for climate-related risks and opportunities, including expanding the current executives' skills based on the skill matrix review.	Level 3	<ul style="list-style-type: none"> <li>• It is recommended to establish a formalized executive-level training program including ESG and climate risks.</li> </ul>	2023-2025
Q7, Q8	Q7. The company has a remuneration policy. Q8.a The company has a general remuneration policy but it does not yet link executive compensation to meeting sustainability/ ESG or climate-related KPIs.	Level 1	<ul style="list-style-type: none"> <li>• Introduce incentives related to climate targets, emissions reduction targets into the remuneration policy of the company.</li> </ul>	2023-2050

\*See Annex for the questions of the EBRD CCG Assessment Matrix

# Corporate Climate Governance (CCG) Assessment Results - EBRD CCG Assessment Matrix

## Section B. STRATEGY

Question	EBRD CCG Matrix answer	Maturity Level	Opportunity for improvement – Action Plan item	Short Term (2023-2025) / Long Term (2023-2050)
Q9, Q10	<p>Q9. The company has a mission and strategic aims and objectives, according to the policy on Integrated Management System of Navoiyazot.</p> <p>Q10.b Some sustainability / ESG and climate-related aspects are reflected in the company's general business strategy, policy or targets (KPIs). Monitoring of KPIs is on the board agenda on an ad hoc basis.</p>	Level 2	<ol style="list-style-type: none"> <li>For the risks and opportunities identified, it is recommended to discuss what is the company's strategy to mitigate risk and capture opportunities.</li> <li>Discuss on management level (Management Board) how climate-related risks and opportunities affect the company's business planning and strategy in the following areas: Products and services, Supply chain / value chain, Adaptation and mitigation activities, R&amp;D investments, Operations, Access to capital.</li> <li>Communicate the findings of the climate-related risks and opportunity assessment and scenario analysis to the relevant departments and functions (IMS, Department on Environmental Protection, Health and Safety, Chief Engineer, emergency management team).</li> <li>Conduct scenario analysis for the supply chain could be affected by physical climate change and risks or opportunities caused by a transition towards a low carbon economy conducted by ERM to be reviewed by top-management.</li> <li>Regularly (approx. every 2 years) review climate risk and opportunity assessment for physical and transition risks and perform scenario analysis, considering different time frames (short, medium, long-term).</li> <li>Consider the identified increasing risks of extreme heat and cold, water scarcity, droughts and wildfires – as the most material physical climate risks for Navoiyazot - by 2030 and 2050 when defining CapEx and OpEx for next years.</li> </ol>	<p>2023-2025</p> <p>2023-2025</p> <p>2023-2025</p> <p>2023-2025</p> <p>2023-2050</p> <p>2023-2050</p>

# Corporate Climate Governance (CCG) Assessment Results - EBRD CCG Assessment Matrix

## Section C. RISK MANAGEMENT AND PROCESSES

Question	EBRD CCG Matrix answer	Maturity Level	Opportunity for improvement – Action Plan item	Short Term (2023-2025) / Long Term (2023-2050)
Q11, Q12	Q11. The company has a robust risk management system and processes based on the Integrated Management Systems (IMS). Q12.b The company conducts ad hoc assessments of sustainability/ ESG with a focus on direct risks but does not have a process to assess on a regular basis climate-related risks and opportunities.	Level 2	<ol style="list-style-type: none"> <li>Update risk management processes for identifying and assessing climate-related risks and their importance for the business and for identifying existing and future laws and regulations, including the use of multiple climate scenarios, for multiple timeframes to cover risks and opportunities.</li> <li>Develop a detailed action plan, KPIs and process for regular monitoring of identified risks and opportunities (also consider a financial quantification of risks) and for their integration into business strategy.</li> <li>Continue working on metrics and targets, for example: <ul style="list-style-type: none"> <li>Total energy consumed, broken down by source (e.g. purchased electricity and renewable sources);</li> <li>Total energy intensity - by tons of product, amount of sales, number of products depending on informational value;</li> <li>Percent of fresh water withdrawn in regions with high or extremely high baseline water stress;</li> <li>Revenues/savings from investments in low-carbon alternatives (e.g. R&amp;D, equipment, products or services);</li> <li>GHG emissions intensity from buildings (by occupants or square area) and from new construction and redevelopment;</li> <li>Expenditures (OpEx) for low-carbon alternatives (e.g. R&amp;D, technology, products, or services);</li> <li>Investments in new technologies are needed to manage transition risk.</li> </ul> </li> </ol>	2023-2025  2023-2025  2023-2050
Q13	Q13.b The company has a risk register and is in the process of developing metrics and tools to carry out scenario analyses and climate stress tests. The risk department develops basic scenario analyses and stress tests. (The scenario analysis was performed by ERM in the framework of this project).	Level 2	<ol style="list-style-type: none"> <li>Add identified climate-related risks (physical: water stress, drought, wildfires and heat; and transition: carbon pricing mechanisms, investors / stakeholders favoring low carbon investments, and enhanced emissions-reporting) [and opportunities] to the risk register.</li> <li>Conduct a more in-depth assessment of climate risks and opportunities for Navoiyazot and UKS as a whole. Conduct more detailed assessment of asset-specific physical and transition risks and also consider a financial quantification of risks</li> <li>Regularly (based on the established frequency) update risk register and existing risk management procedures depending on changes to the organization (e.g. changes to the business model, changes due to mergers or acquisitions).</li> </ol>	2023-2025  2023-2025  2023-2050
Q14	Q14.b The company has an internal audit function and the validation of the consistency and robustness of sustainability/ ESG and climate-related data, information and reporting processes is in the Internal Audit Plan, but no recommendations or actions by the board have been put forward.	Level 2	<ol style="list-style-type: none"> <li>Include climate-related topics to the agenda of the internal audit.</li> <li>Develop climate-related risk mitigation and adaptation plans for assets and at a company level which are approved by the board.</li> <li>Review coverage of existing corporate insurance contracts to see which climate related risks would be covered; if none consider making adjustments.</li> <li>Regularly adjust risk mitigation and adaptation plans depending on changes to the organization (e.g. changes to the business model, changes due to mergers &amp; acquisitions) or already materialized risks (e.g. damages to plants or facilities due to increased heat or wildfires).</li> </ol>	2023-2025  2023-2025  2023-2025  2023-2050

# Corporate Climate Governance (CCG) Assessment Results - EBRD CCG Assessment Matrix

## Section D. REPORTING, DISCLOSURE AND ENGAGEMENT

Question	EBRD CCG Matrix answer	Maturity Level	Opportunity for improvement – Action Plan item	Short Term (2023-2025) / Long Term (2023-2050)
Q15	Q15.a The company has a website and publishes its annual report but it does not report on sustainability/ESG or climate-related matters.	Level 1	<ol style="list-style-type: none"> <li>1. Prepare a company's annual sustainability / ESG report (understood to be in progress), which includes climate-related risk and opportunity disclosure in line with TCFD and reference to a Climate Policy / Statement signed by a member of executive management.</li> <li>2. The sustainability / ESG report is assured internally and externally.</li> </ol>	2023-2025 2023-2025
Q16	Q16.a The company does not disclose information related to GHG emissions externally.	Level 1	<ol style="list-style-type: none"> <li>1. Define emission reduction targets for Scope 1 and 2 (and for Scope 3) GHG emissions for Navoiyazot in line with UKS's vision statement on emissions reduction.</li> <li>2. Disclose the Scope 1, 2 and 3 (in the future) emissions and targets. Disclose this information in the sustainability report or on the company's website.</li> </ol>	2023-2030 2023-2030
Q17, Q18	Q17.a and 18.a The company does not disclose on climate-related risks and opportunities.	Level 1	<ol style="list-style-type: none"> <li>1. Disclose information on climate-related risks and opportunities, introduced risk management processes and strategic decision identified for Navoiyazot (already prepared in the framework of TCFD disclosure) and update this material regularly.</li> <li>2. In line with TCFD recommendations, it is recommended to disclose actual and potential impacts of climate-related risks and opportunities on the company's strategy and financial planning and how your business strategy is resilient considering the transition to low-carbon economy with 2°C scenario: how strategies may change to address potential risks and opportunity, potential impact on financial indicators (revenue, costs, assets, liabilities).</li> </ol>	2023-2030 2023-2050
Q19	Q19.b The company makes generic statements about sustainability/ ESG governance but it does not specifically describe governance of climate-related issues.	Level 2	<ol style="list-style-type: none"> <li>1. Disclose information on governance of climate-related issues (already prepared in the TCFD disclosure format), including for example how climate-related responsibilities are assigned at management level; description of the organizational structure; process how management is informed about climate-related issues; how management monitors climate-related issues.</li> <li>2. Disclose information on how climate-related KPIs are included into a remuneration strategy of the company.</li> </ol>	2023-2030 2023-2050
Q20	Q20.a The company does not engage with its shareholders on sustainability/ESG or climate-related issues.	Level 1	<ol style="list-style-type: none"> <li>1. Disclose climate-related risks and opportunities in financial reports and present and discuss results at Board meeting and inform shareholders of the results.</li> </ol>	2023-2050
Q21	Q21.b The company engages with stakeholders on general sustainability/ESG and/or climate-related issues.	Level 2	<ol style="list-style-type: none"> <li>1. Organize stakeholder consultation that is dedicated specifically to climate risks and opportunities to inform the board and executive management and inform shareholders of the results.</li> </ol>	2023-2050

# Low Carbon Pathway Action Plan

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# Different assumptions are modelled to showcase how key parameters like renewable electricity (RE) price affect the Low Carbon Pathway (LCP)

- The “**LCP reference scenario**” models the emissions reduction potential of **several abatement options**.
- A “**Lower cost sensitivity**” scenario in the table below is modelled with **considerably lower renewable electricity (RE) and green H<sub>2</sub> prices**.
- Price inputs are based on large planned RE projects in Uzbekistan.
- The price of the RE and green H<sub>2</sub> in future years will have a direct effect on the selected abatement technologies in the suggested LCP and the extent of their use (e.g. green H<sub>2</sub> comes into play in the “Lower cost sensitivity” scenario and reduces the need for CCS).

Sensitivity		Description
LCP reference scenario		The LCP reference scenario consists of the abatement technologies found to be the least cost options for decarbonisation of emissions contained in the baseline up to 2050. The impact of water stress on technology availability is not considered. Renewable electricity cost is assumed at \$38/MWh in 2023 and \$28/MWh in 2050 based on EBRD projections.
Lower cost sensitivity	Renewable electricity price	Lower prices for renewable electricity may be available than the price given in the LCP reference. Navoiy Solar PV Park supplies power at \$27/MWh for a period of 25 years. \$18/MWh has been awarded in Uzbekistan start up in Sherabad district, Surkhandarya region with planned start up 2024. It is assumed that the RE price starts at \$27/MWh in 2023 and reduces to \$18/MWh by 2030.
	H <sub>2</sub> price	The lower H <sub>2</sub> price is calculated using the lower renewable electricity price above within a H <sub>2</sub> pricing model. The price starts at \$87/MWh (\$2.9/kg H <sub>2</sub> ) in 2023 and reduces to \$51/MWh (\$1.7/kg H <sub>2</sub> ) by 2050.

# Summary of the LCP and future actions for UKS and the government

## LCP conclusions

### LCP Conclusions

- N<sub>2</sub>O emissions can be readily abated but there is little financial motivation to install N<sub>2</sub>O abatement technology currently. Support through the Deutsche Gesellschaft für Internationale Zusammenarbeit (GIZ) is available to reduce CAPEX through the [Nitric Acid Climate Action Group](#), with which UKS is already working towards this target.
- Electrification of boilers and of some of the production technologies will play a key role in decarbonising the Navoiyazot plant, but sufficient rollout of renewables capacity is necessary. Up to 5.6 TWh/y of renewable electricity will be needed to cover all electrified processes in Navoiyazot, equivalent to 9% of 2019 electricity production in Uzbekistan.
- CCS and green H<sub>2</sub> also represent a significant portion of the low carbon pathway, but their deployment should be carefully considered along with their water intensity, in a water-stressed country like Uzbekistan.

## Short term ambition 2023 – 2030

### Uzkimiyosanoat (UKS) / Navoiyazot

- Significantly reduce N<sub>2</sub>O emissions through N<sub>2</sub>O abatement technology
- Develop RE on-site and investigate investment in RE and green H<sub>2</sub> projects
- Initiate CCS project discussions and deployment with the government and stakeholders

## Long term ambition 2030 – 2050

- Electrify the boilers across the plant
- Deploy electrified technologies (e.g. electrified SMR and acetylene production) once they become commercially mature
- Use green H<sub>2</sub> for the decarbonisation of the older NH<sub>3</sub> production unit once green H<sub>2</sub> becomes available after 2030, and if environmentally and financially viable
- Participate in the formation of CCS clusters and abate emissions through the use of CCS

### Government

- Introduce a Greenhouse Gas (GHG) emissions Monitoring, Reporting and Verification system with frequent reporting to verify the emissions reduction
- Financially support the renewable electricity development and establish a regulatory framework to advance the RE penetration
- Financially support the deployment of abatement technologies that require upfront capital expenditure (e.g. N<sub>2</sub>O abatement, electrified technologies using renewable electricity)
- The reforming of subsidies and the adoption of a carbon pricing mechanism could level the field for RE and green H<sub>2</sub> to be more competitive. Reduce the attractiveness of carbon-intensive production methods e.g. by increasing the price of natural gas for industrial use to help the shift to electrified technologies
- Capacity building e.g. through energy efficiency campaigns & technology transfer assistance to promote abatement technologies

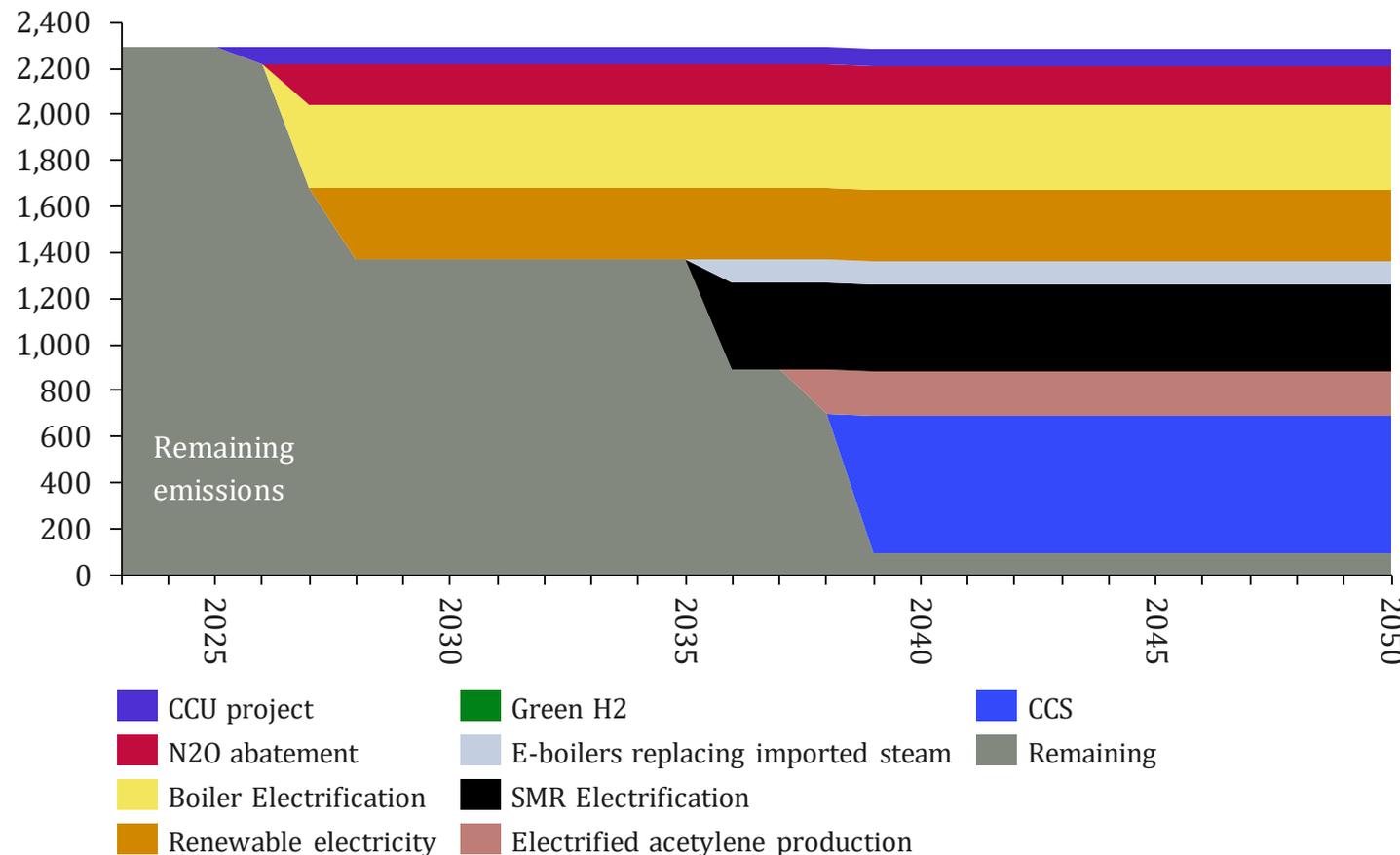
### Investors, Associations & international customers

- Support from international financing mechanisms, e.g. initiatives like the Green Climate Fund and the Green Hydrogen Bank, as well as from multilateral development banks like the EBRD which can provide concessional loans
- Identification and financing support of feasibility studies and projects
- Capacity building campaigns and technology transfer assistance e.g. technical assistance programs of the EBRD like the [Support for Implementation of Wind Auctions in Uzbekistan](#)

# The LCP includes several technologies with significant introduction of renewable electricity and carbon capture and storage (CCS)

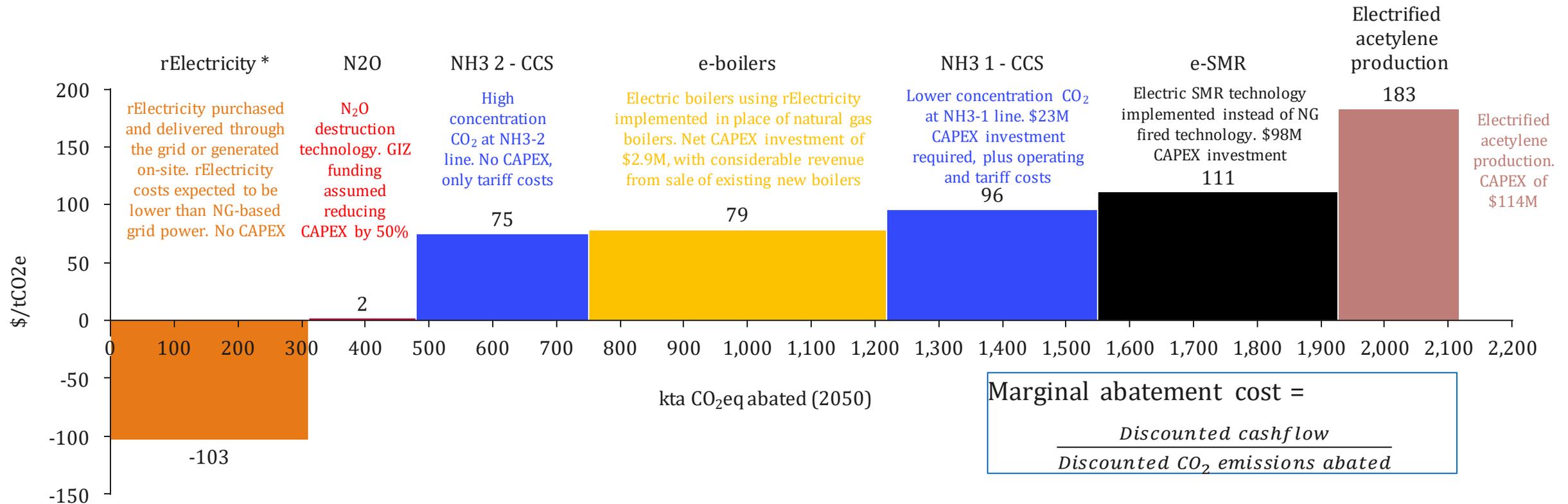
The LCP reference scenario selects the least cost options for decarbonisation of emissions contained in the baseline up to 2050. Renewable electricity cost is assumed at \$38/MWh in 2023 and \$28/MWh in 2050 based on EBRD projections.

Production emissions reductions by abatement technology (ktCO<sub>2</sub> / yr)



- The LCP reference scenario abates **~96% of 2023** plant emissions by **2050**
- The pathway suggests **N<sub>2</sub>O abatement and boiler electrification** should be **implemented quickly**
- The pathway has a strong reliance on **renewable electricity\*** and **CCS** to achieve decarbonisation:
  - Renewable electricity for heat and power: 5.6 TWh/yr
    - Equivalent to 9% of 2019 electricity production in Uzbekistan<sup>1</sup>
    - UKS has previously reported 0.4 TWh/yr (7% of the forecast requirement) could be met with onsite solar
    - 2.1TWh/yr of RE (37.5% of the forecast requirement) is planned for the Navoi region.
  - CCS transport & storage infrastructure required for 600 kt CO<sub>2</sub>/yr
- Significant **infrastructure developments** will be **required** to achieve this LCP, related to renewable energy and CCS

# LCP marginal abatement cost highlights the relative cost of each technology and attractiveness of switching to renewable electricity

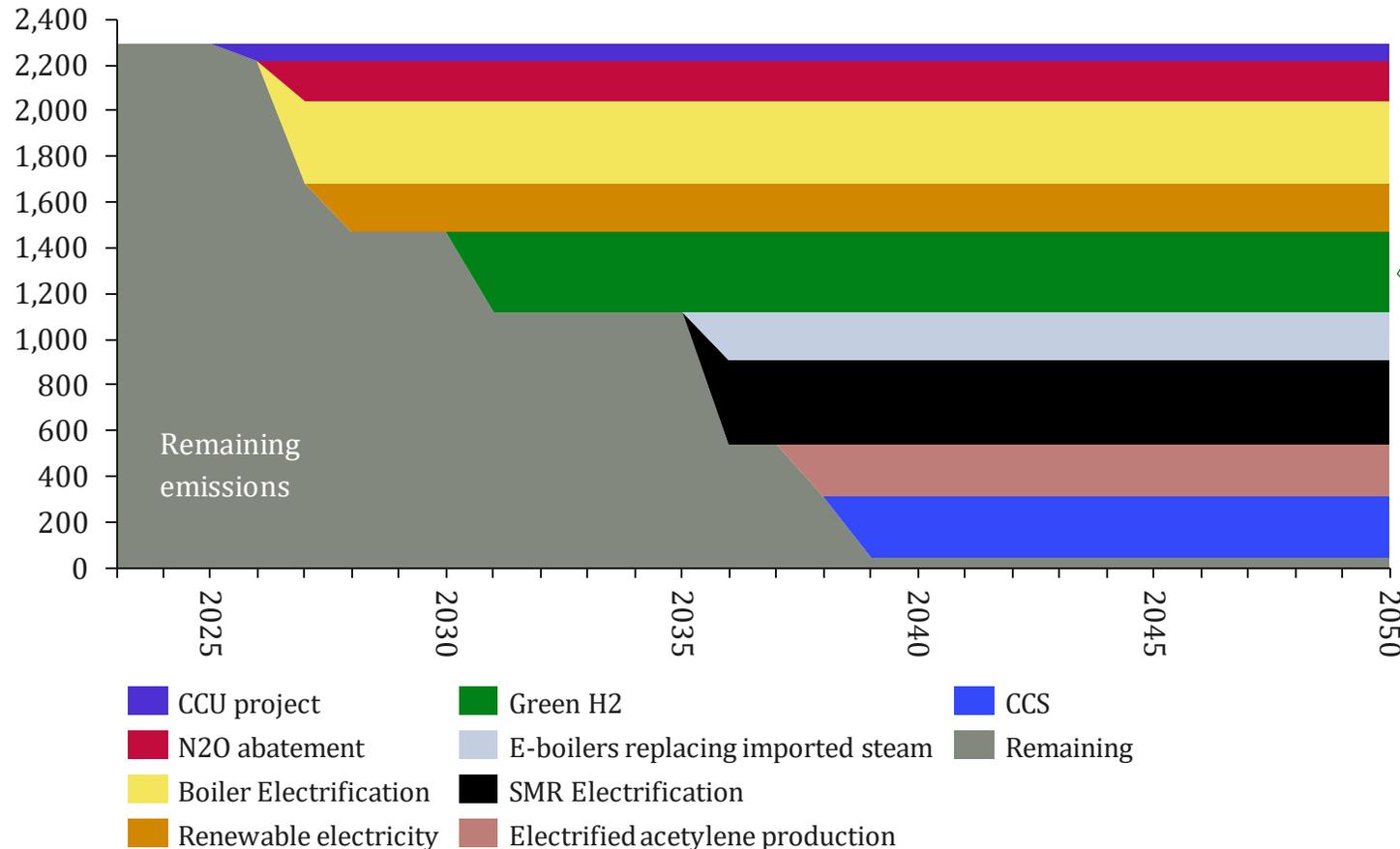


- The overall marginal abatement cost for the LCP is **\$34/t CO<sub>2</sub>eq** – this is the weighted average over the entire lifetime of the LCP
- Decarbonising current electricity consumption with renewable electricity is by far the lowest cost technology option and can be implemented early in the LCP
- There is additional cost to CCS for the older NH<sub>3</sub> unit (NH<sub>3</sub> 1) due to the lower concentration of the CO<sub>2</sub>
- CAPEX figures provided are non-discounted. Key fuel cost assumptions are provided in the Appendix

# The Low RE price scenario considers lower cost renewable electricity and green H<sub>2</sub> - resulting in green H<sub>2</sub> utilisation in the pathway

Lower prices for RE and green H<sub>2</sub> assumed in this scenario. It is assumed that the RE price starts at \$27/MWh in 2023 and reduces to 18 USD/MWh by 2030. The green H<sub>2</sub> price using these RE costs starts at 87 \$/MWh in 2023 and reduces to 51 \$/MWh by 2050.

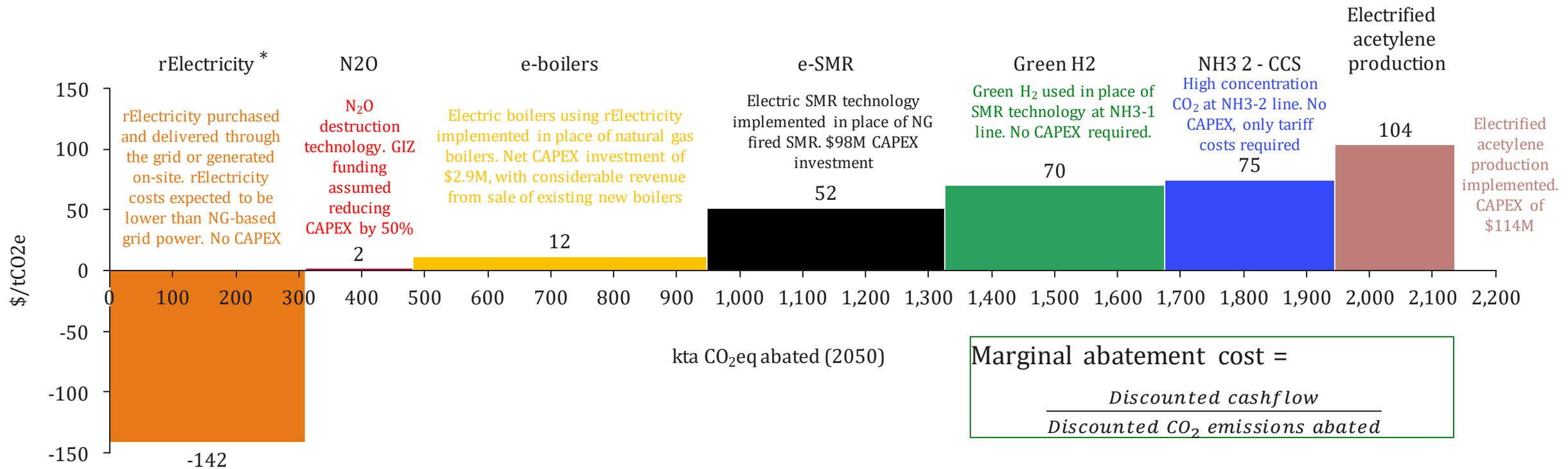
Production emissions reductions by abatement technology (ktCO<sub>2</sub> / yr)



## Green H<sub>2</sub>

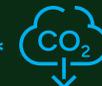
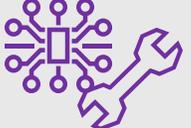
- In this scenario, **green H<sub>2</sub> is selected over CCS** to decarbonise the **older NH<sub>3</sub> unit**
- We assume that green H<sub>2</sub> becomes readily available after 2030 when it has been proven at scale
- We assume that green H<sub>2</sub> is made with 100% renewable electricity, operating at high utilization
- Green H<sub>2</sub> displaces far more NG in the older NH<sub>3</sub> unit and is relatively cheaper, due to lower NG/H<sub>2</sub> efficiency. CCS is still the preferred option for the newer NH<sub>3</sub> unit
- The **water intensity of green H<sub>2</sub>** should be **considered** in a water-stressed country like Uzbekistan

# Lowering the renewable electricity and H<sub>2</sub> price lowers marginal abatement cost and makes green H<sub>2</sub> more attractive



- The overall marginal abatement cost for the sensitivity pathway is **-\$1/t CO<sub>2</sub>eq** – this is the weighted average over the entire lifetime of the LCP
- Lowering the price of renewable electricity and green H<sub>2</sub> reduces the marginal abatement cost of most technologies, lowering OPEX (except for N<sub>2</sub>O abatement and CCS)
- The cost of green H<sub>2</sub> (\$70/tCO<sub>2</sub>eq) is lower than the cost of CCS (\$96/tCO<sub>2</sub>eq) under the LCP reference scenario for the older NH3 unit (NH3 1) causing the switch from CCS to green H<sub>2</sub> for emissions abatement
- CAPEX figures provided are non-discounted. Key fuel cost assumptions are provided in the Appendix.

# Abatement technologies and economic & policy barriers to overcome

Abatement technology	 <b>N<sub>2</sub>O abatement &amp; efficiency</b>	 <b>Electrification with RE</b>	 <b>CCS*</b>	 <b>Green H<sub>2</sub></b>
<b>Overview of technology</b> 	<ul style="list-style-type: none"> <li>Efficiency of production associated with energy consumption.</li> <li>N<sub>2</sub>O (nitrous oxide) abatement technologies destroy N<sub>2</sub>O, a potent GHG, which would otherwise be emitted from nitric acid plants.</li> </ul>	<ul style="list-style-type: none"> <li>Renewable electricity (RE) can be used to directly electrify processes reducing the need to use natural gas for electricity and steam production</li> <li>RE is needed to make Green Hydrogen, which can substitute the hydrogen made from natural gas feedstock (see Green H<sub>2</sub>)</li> </ul>	<ul style="list-style-type: none"> <li>Carbon Capture and storage (CCS) to capture CO<sub>2</sub> emissions associated with reforming natural gas feedstock and burning natural gas fuel</li> <li>The captured CO<sub>2</sub> is transported by pipeline, rail or truck to geological storage sites where it is sequestered</li> </ul>	<ul style="list-style-type: none"> <li>Green hydrogen (H<sub>2</sub>) is made from the electrolysis of water using RE</li> <li>Green H<sub>2</sub> can substitute hydrogen made from natural gas in ammonia production</li> </ul>
<b>Barriers to use</b> 	<ul style="list-style-type: none"> <li>Upfront capital investment required for energy efficiency projects</li> <li>Lack of incentive (e.g. NO<sub>x</sub> limits) to install N<sub>2</sub>O abatement technologies. There are currently no regulations for nitrous oxide emissions in Uzbekistan.</li> <li>Lack of incentive to reduce the carbon footprint of fertilizer and chemicals production, as there is no carbon pricing mechanism in place in Uzbekistan and carbon reduction targets for these sectors are loosely defined.</li> </ul>	<ul style="list-style-type: none"> <li>Use of renewable electricity is limited by deployment of RE and grid capacity. Existing infrastructure may not be adequate to deliver the required RE.</li> <li>Electrification of processes can involve high capex and opex, depending on the process being electrified.</li> <li>Partial or full electrification may result in changes to the plant energy balance.</li> <li>Some electrified processes, e.g. acetylene production or SMR are not mature, leading to deployment delay.</li> <li>Lack of policy support for the adoption of electrified technologies.</li> <li>Lack of a regulatory framework in Uzbekistan to support renewables penetration.</li> </ul>	<ul style="list-style-type: none"> <li>Geological storage potential in Uzbekistan and CO<sub>2</sub> export opportunities are not well understood</li> <li>Lack of legislation governing CCS value chain (capture, transport, storage)</li> <li>Significant upfront capex needed to develop CCS infrastructure (capture, transport, storage)</li> <li>Considerable development and operational risks associated with CCS including, revenue / business model risk, inter-dependency risk (coordination across capture, transport, storage), technology risk, carbon liability risk associated with potential CO<sub>2</sub> leakage</li> <li>Challenging financing of CCS projects due to high capex and risk</li> <li>CCS can be very water-intensive, while Uzbekistan is a water-stressed country</li> </ul>	<ul style="list-style-type: none"> <li>Green H<sub>2</sub> is currently expensive to produce. This is largely due to the electrolyser capex and the cost of RE, as well as transport of H<sub>2</sub>. Also, large scale electrolyzers stand at lower maturity.</li> <li>The price of natural gas is currently low in Uzbekistan relative to the RE price, not allowing green H<sub>2</sub> to be competitive even in 2050, if not increased.</li> <li>Green H<sub>2</sub> is very water-intensive, while Uzbekistan is a water-stressed country. Competition with the agricultural sector for water resources is expected.</li> <li>RE is required to produce green H<sub>2</sub>. Limited capacity and grid infrastructure may limit deployment.</li> </ul>

# Summary overview of action that is required from the government and private sector to address these barriers to deployment

Abatement technology	<b>N<sub>2</sub>O abatement &amp; efficiency</b> 	<b>Electrification with RE</b> 	<b>CCS</b> 	<b>Green H<sub>2</sub></b> 
<b>UKS/ Navoiyazot</b>  	<ul style="list-style-type: none"> <li>Invest in N<sub>2</sub>O abatement technology to eliminate N<sub>2</sub>O emissions. Investigate supporting mechanisms (Article 6 of Paris agr.) and finance e.g. GIZ, EBRD</li> <li>Investigate energy efficiency opportunities, particularly for older units of the Navoiyazot plant</li> <li>Set carbon footprint targets and assign executive-level accountability to prepare to meet external stakeholder expectations</li> </ul>	<ul style="list-style-type: none"> <li>Develop RE onsite and/or secure dedicated RE via PPAs</li> <li>Understand the feasibility and implications of SMR electrification</li> <li>Invest in easy-to-deploy electrification technologies (e.g. replace natural gas boilers with e-boilers)</li> </ul>	<ul style="list-style-type: none"> <li>Work with other players/industries to identify opportunities for CCS clusters and help develop investment case for CCS</li> <li>Initiate cluster projects and develop CCS feasibility studies</li> <li>Ensure sustainability of water use and investigate the possibility to source water from less water-stressed regions in Uzbekistan</li> </ul>	<ul style="list-style-type: none"> <li>Develop business case / feasibility studies for investment in Green H<sub>2</sub></li> <li>Investigate the sustainability of water use for electrolysis and the possibility to source water from less water-stressed regions in Uzbekistan</li> <li>Support the scale-up of renewable electricity to supply green H<sub>2</sub> production</li> </ul>
<b>Government</b>  	<ul style="list-style-type: none"> <li>Set clearly defined emissions reduction targets, including N<sub>2</sub>O emission limits</li> <li>Financially support energy efficiency and N<sub>2</sub>O destruction projects</li> </ul>	<ul style="list-style-type: none"> <li>Financially support RE development</li> <li>Establish regulatory framework to advance RE penetration</li> <li>Reform subsidies and consider the creation of a carbon pricing mechanism to level the field for RE</li> <li>Financially support industrial projects deploying electrified (RE) technologies</li> <li>Remove NG subsidies for industrial use</li> </ul>	<ul style="list-style-type: none"> <li>Understand geological storage potential of new and existing CCS sites</li> <li>Incentivise CCS implementation via cluster formation support</li> <li>Develop supply chain-wide legislation</li> <li>Reduce cost of CCS infrastructure and enhance business case through funding of studies to identify low-cost solutions</li> </ul>	<ul style="list-style-type: none"> <li>Introduce policy support mechanism for green H<sub>2</sub> e.g. carbon pricing to allow green H<sub>2</sub> to compete with natural gas or RE subsidies for green H<sub>2</sub> production</li> <li>Investigate if H<sub>2</sub>O consumption will excessively compete with agricultural demand (e.g. impose usage limits)</li> <li>Remove NG subsidies for industrial use</li> <li>To develop RE for electrolysis, the same actions as electrification are required</li> </ul>
<b>Investors, associations &amp; international customers</b>	<ul style="list-style-type: none"> <li>Reduce the attractiveness of carbon-intensive production methods e.g. by removing subsidies of natural gas for industrial use</li> <li>Support with international financing mechanisms</li> <li>Identification and financing support of feasibility studies and projects</li> </ul>			

# Priority actions

## Priority actions for UKS and the Government

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/  
Navoiyazot

- Investigate financial support mechanisms and invest in N<sub>2</sub>O abatement technology for Nitric Acid Line 1
- Investigate energy efficiency improvement opportunities, particularly for the old lines of the Navoiyazot plant
- Set internal emissions targets and assign executive-level accountability to ensure they are met
- Invest in easy-to-deploy electrifications technologies like e-boilers
- Investigate the implications of SMR and acetylene production electrification to the process
- Initiate the discussion with the government and other players on CCS project feasibility and the formation of CCS clusters
- Develop RE on-site and investigate investment in RE and green H<sub>2</sub> projects. Secure dedicated RE through PPAs with planned projects

Government

- Introduce N<sub>2</sub>O-limiting laws with clearly defined emissions reduction targets
- Financially support energy efficiency and N<sub>2</sub>O reduction projects
- Financially support RE rollout and establish a regulatory framework to advance their penetration
- Increase the cost competitiveness of RE and green H<sub>2</sub> through various mechanisms (subsidies, carbon pricing)
- Carry out geological studies to identify CCS sites and confirm that they are suitable for permanent storage
- Develop supply chain-wide legislation for CCS
- Financially support feasibility studies for CCS projects and CCS clusters
- Investigate the sustainability of water usage in green H<sub>2</sub> production and CCS and how it is expected to compete with agriculture.

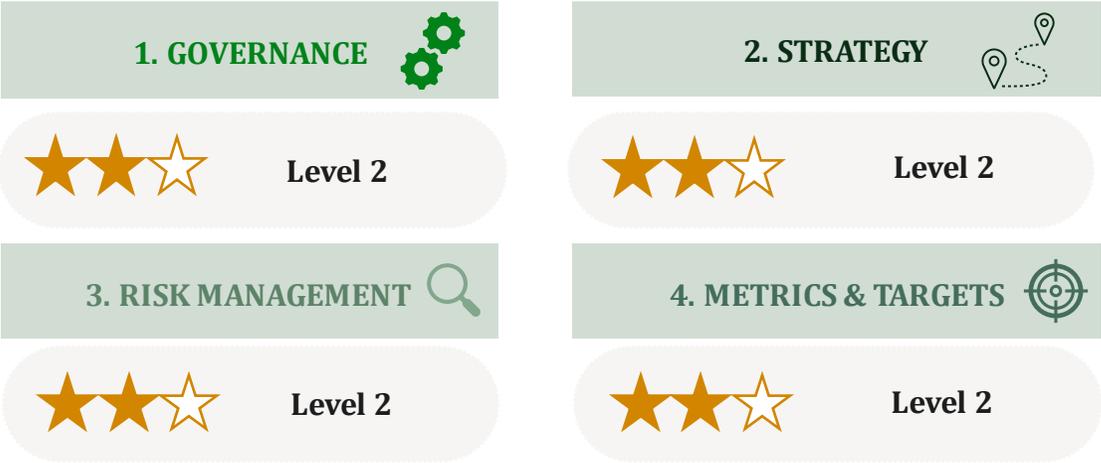
# Conclusion

- 1 Introduction
- 2 Corporate Climate Governance Action Plan
- 3 Low Carbon Pathway Action Plan
- 4 **Conclusion**

# Conclusion

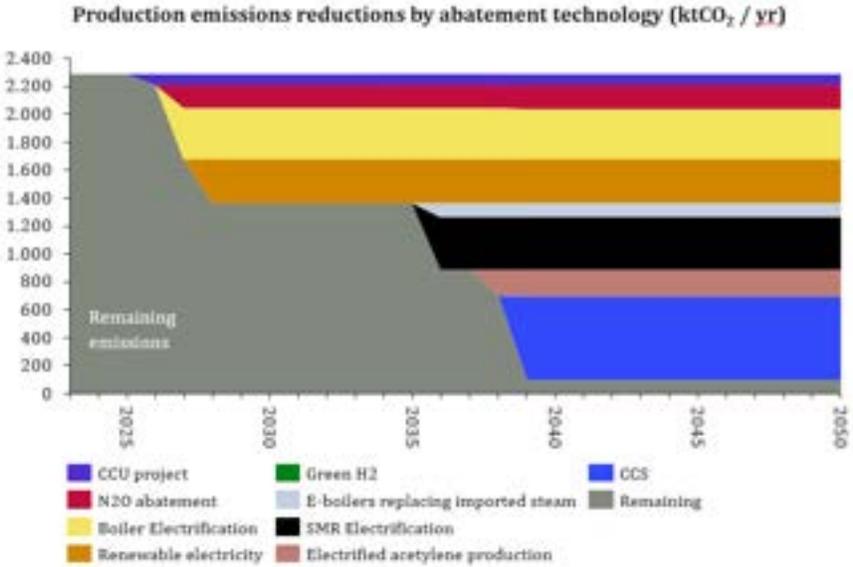
## Resulting actions for improving Corporate Climate Governance

There are a number of identified actions for Navoiyazot to improve Corporate Climate Governance. Having a holistic Corporate Climate Governance will allow Navoiyazot to **enhance resilience, strengthen competitiveness, reveal opportunities and unlock finance**. Moreover, it will enable the **successful realization of the abatement technologies**.



## Resulting actions for implementing abatement technologies

Decarbonising the Navoiyazot plant requires the implementation of a **variety** of abatement measures. Some are readily available and involve minimal upfront capital expenditure, while others require **coordination and support** from the government on a **financial and legislative level**. Ensuring the development of **adequate renewable electricity capacity and of a CCS supply chain** are of paramount importance for the realization of the LCP.



# Thank you

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# Appendix 1

LOW CARBON PATHWAY

# Different LCP assumptions are modelled to enable the discussion on key parameters like RE price and water intensity of abatement options

- The “**Baseline**” scenario only includes the planned CCU project but **no other abatement technologies**.
- The “**LCP reference Scenario**” models the emissions reduction potential of **several abatement options**.

Scenario	Description
Baseline	The baseline consists of the current technologies operating until 2050 without any low carbon abatement option, except the carbon capture and utilisation project, which has reached FID. No capacity adjustments or new product lines are considered in the baseline, the product mix and volume remains as it was in 2022. The baseline provides the “counterfactual” to the LCP scenario with cost inputs as found in the following slide.
LCP reference Scenario	The LCP reference scenario consists of the abatement technologies found to be the least cost options for decarbonisation of emissions contained in the baseline up to 2050. The impact of water stress on technology availability is not considered. Costs assumed are as in the following slide.

- A “**Lower cost sensitivity**” scenario in the table below is modelled with **considerably lower RE and green H<sub>2</sub> prices**.
- Price inputs are based on large planned RE projects in Uzbekistan.

Sensitivity		Description
Lower cost sensitivity	Renewable electricity price	Lower prices for renewable electricity may be available than the price given in the LCP reference. Navoiy Solar PV Park supplies power at \$27/MWh for a period of 25 years <sup>4</sup> . 18 \$/MWh has been awarded in Uzbekistan start up in Sherabad district, Surkhandarya region with planned start up 2024. It is assumed that the renewable electricity price starts at \$27/MWh in 2023 and reduces to 18 USD/MWh by 2030.
	H <sub>2</sub> price	The lower H <sub>2</sub> price is a calculated using the lower renewable electricity price above within a H <sub>2</sub> pricing model. The price starts at \$87/MWh (\$2.9/kg H <sub>2</sub> ) in 2023 and reduces to \$51/MWh (\$1.7/kg H <sub>2</sub> ) by 2050.

# Uzbekistan has low-cost natural gas and solar

The baseline/LCP reference case assume a constant natural gas price

## Cost and price inputs

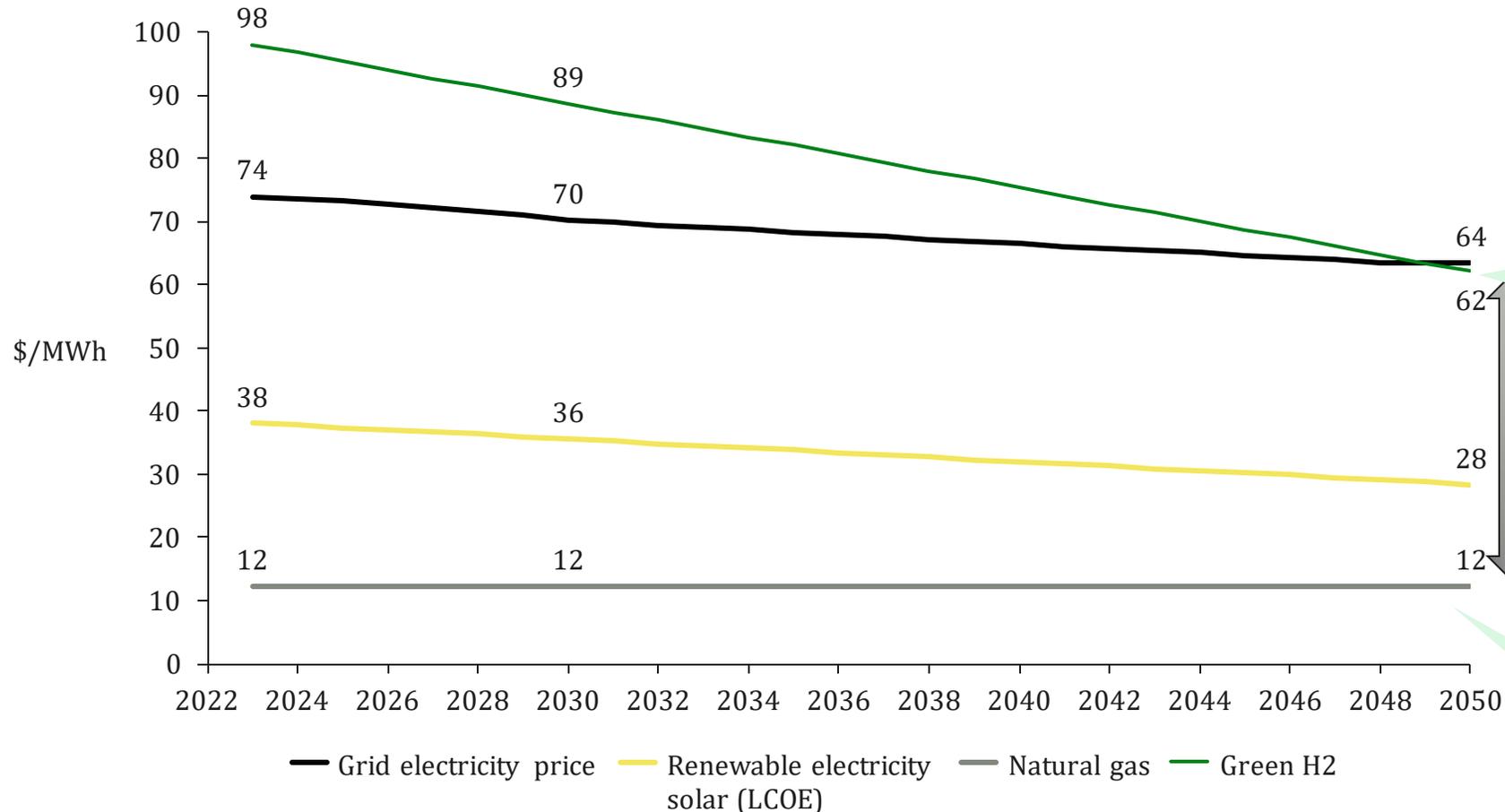
Input	Unit	Baseline/LCP		Notes/sources
		2023	2050	
Natural gas	USD/MMBtu	3.6	3.6	Based on 1,500,000 soums per 1000 m <sup>3</sup> .* We have assumed that the gas price remains constant to 2050 in the baseline and LCP due to limited information about potential changes in price and/or market liberalization published.
Grid electricity	USD/MWh	74	64	Based on 900 soums per kWh.* Grid mixture includes 87.8% Natural gas, 7.5% Hydro, 4% Coal and 0.7% Oil. Renewable Energy share in the Uzbekistan energy mix is expected to reach 20% by 2025 and 25% by 2030 <sup>3</sup> .
Navoi power plant electricity	USD/MWh	74	74	Based on 900 soums per kWh.* Constant to 2050 as the natural gas price remains constant. All of the electricity consumed at Navoiyazot is from the local combined heat & power plant.
Renewable electricity (solar)	USD/MWh	38	28	The EBRD has provided LCOE projections, including transmission fees, for the years 2030 and 2040. Renewable energy price projections were derived through linear extrapolation.
Green Hydrogen	USD/MWh	98	62	LCOH projections have been provided by the EBRD for the years 2030 and 2040. Green H <sub>2</sub> price projections were derived through linear extrapolation.
Imported steam (Navoi power plant)	USD/MWh	31	31	Steam price calculated using an internal ERM model. Constant to 2050 as the natural gas price remains constant.

\* Converted using exchange rate 1 soum to 0.0000819 USD1.

\*\* Conversion of m<sup>3</sup> of natural gas to MMBtu using 0.3MMBTU/1000m<sup>3</sup>.<sup>2</sup>

# Renewable electricity and green H<sub>2</sub> prices are expected to decrease towards 2050

Energy price assumptions used in baseline and LCP reference scenario



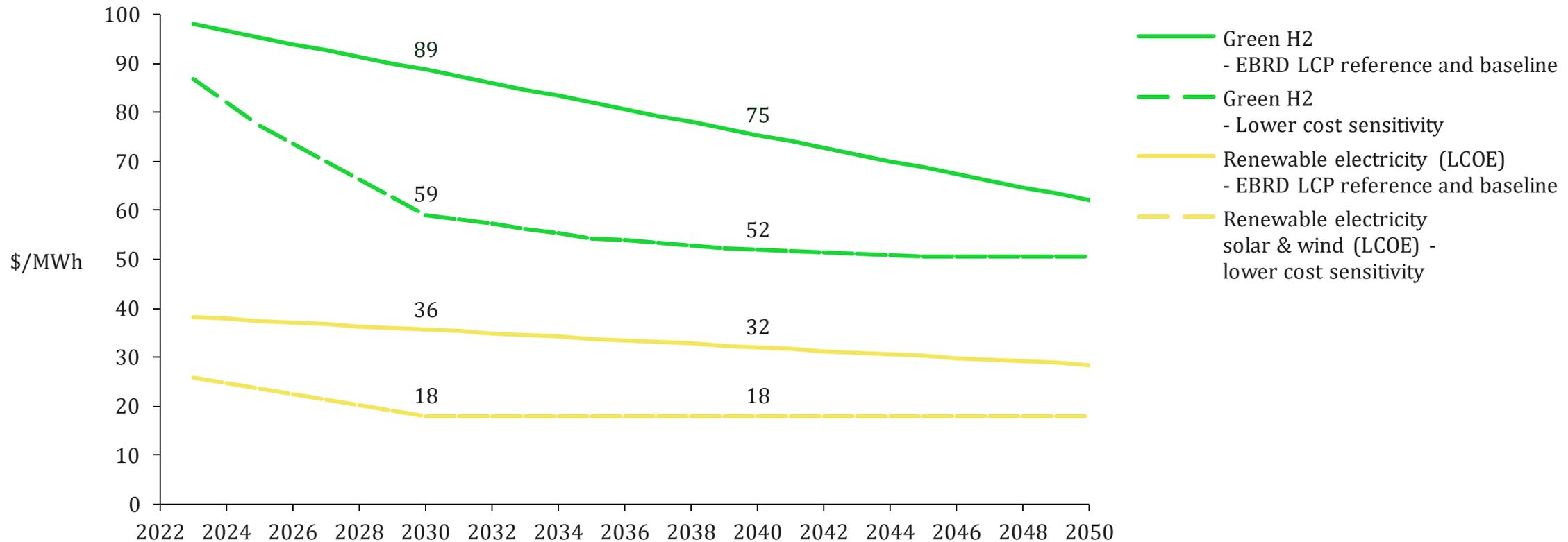
With an increasing renewables penetration in the grid, and a decreasing RE price, the overall grid price is expected to decrease<sup>1</sup>

The price of green H<sub>2</sub> (~2\$/kg in 2050) remains significantly higher than natural gas. The natural gas gap with renewable electricity is much smaller.

The low price of natural gas makes it challenging for renewable options to be competitive.

# Alternative sources suggest lower renewable electricity and hydrogen costs

## Alternative renewable electricity and hydrogen price assumptions



- Higher costs provided by the EBRD in Uzbekistan. However, large planned projects might provide cheaper RE.<sup>1</sup>
- Cheaper RE will lower the price of green H<sub>2</sub>.
- Lower cost sensitivity prices might not represent a LCOE that includes transmission fees.

# Appendix 2

EBRD CCG ASSESSMENT MATRIX

CORPORATE CLIMATE GOVERNANCE ASSESSMENT MATRIX <sup>1</sup>					
CCG COMPONENT	LEVEL 0 <sup>2</sup>	LEVEL 1 NO CCG PRACTICES	LEVEL 2 IMPROVEMENTS TOWARDS GOOD CCG	LEVEL 3 GOOD CCG PRACTICES	LEVEL 4 ADVANCED CCG PRACTICES
A. GOVERNANCE AND ACCOUNTABILITY	The company has no <b>board</b> or it has a board but no bylaws to define the board's responsibilities. (Q1)	The company has a board but no oversight or accountability of sustainability/ESG and climate-related risks and opportunities. (Q.2a)	The company's board bylaws defines the board responsibility for sustainability/ESG, however this does not explicitly cover climate-related risks and opportunities. (Q.2b)	The board sets and monitors the company's climate change goals (i.e., there might be a climate change strategy) but they are not linked to the company's strategy, risk and financial planning). (Q.2c)	The board monitors and gauges the effectiveness of the company's climate change strategies and goals and they are embedded into the company's strategy, risk and financial planning <sup>3</sup> . (Q.2d)
		The company's board is not informed about climate-related issues. (Q.3a)	The company's board and/or board committees are informed about climate-related issues on an <i>ad hoc</i> basis. (Q.3b)	The board and/or board committees are informed about climate-related issues on a regular basis (quarterly). (Q.3c)	Climate change features on the agenda of each of the board meetings. (Q.3d)
	The company has no <b>executive committee</b> or clear mapping of the responsibilities of senior executives. (Q.4)	The company's senior executive management has no responsibility and/or accountability of sustainability/ESG and climate-related risks and opportunities. (Q.4a)	Accountability by senior executive management and operations is reflected by way of regular submission of reports and explanations to the board. This may include sustainability/ESG matters but does not explicitly cover climate-related risks and opportunities. (Q.4b)	A member of senior executive management has general responsibility for climate related risks and opportunities (both transition and physical) and there is a process to inform management of such risks. (Q.4c)	A member of senior executive management has specific responsibility for climate-related risks and opportunities, including policy formulation, incorporating considerations on these risks and opportunities into strategy. There is a strict internal information and risk assessment process. (Q.4d)
		The company does not consider the <b>qualifications</b>	The board members do not possess any technical or regulatory knowledge to enable	The board members possess some technical and regulatory knowledge and the company	The company takes measures to develop and enhance the board's collective knowledge of

<sup>1</sup> The CCG Matrix is drawn from TCFD recommendations, status reports, good market practices reports and case studies, review of other voluntary disclosure standards (e.g., CDP, CDSB, PRI, SASB), EBRD study on CCG (2018) and Corporate Governance standards (OECD and others). These have been adapted to the needs of companies from emerging countries allowing for a different level of maturity and gradual development of climate governance practices for companies.

<sup>2</sup> These are the Corporate Governance minimum requirements that needs to be in place to have CCG.

<sup>3</sup> This transpires from the board minutes and/or from the actions that the board puts forward.

	<p><b>of board members</b> when appointing the board. <b>(Q.5)</b></p>	<p>appropriate oversight of sustainability/ ESG matters or climate change issues. The board members do not receive training on climate-related risks and opportunities. <b>(Q.5a)</b></p>	<p>provides limited capacity building on sustainability/ ESG matters and climate-related issues on an <i>ad hoc</i> basis. <b>(Q.5b)</b></p>	<p>and resources for climate risks and opportunities, including expanding their skills based on the skill matrix review. <b>(Q.5c)</b></p>	<p>climate-related issues is developed in a structured manner, and board members have the expertise, experience and access to relevant resources required for the oversight of climate change issues. <b>(Q.5d)</b></p>
	<p>The company does not provide training to <b>executives and staff</b>. <b>(Q.6)</b></p>	<p>The executives do not possess any technical or regulatory knowledge to enable appropriate assessment and management of sustainability/ ESG matters or climate-related risks and opportunities. <b>(Q.6a)</b></p>	<p>The executives have some limited technical and regulatory knowledge and the company provides capacity building on climate-related issues on an <i>ad hoc</i> basis to the senior management. <b>(Q.6b)</b></p>	<p>The company takes measures to develop and enhance the executive management's collective knowledge of and resources for climate-related risks and opportunities, including expanding the current executives' skills based on the skill matrix review. <b>(Q.6c)</b></p>	<p>In addition to regular training of executives on climate-change issues, capacity for climate-related issues is developed in a structured manner, and executive management have the expertise, experience and access to relevant resources required for their areas of accountability. <b>(Q.6d)</b></p>
	<p>The company does not have <b>remuneration policy</b> for board and executives. <b>(Q.7)</b></p>	<p>The company has a general remuneration policy but it does not yet link executive compensation to meeting sustainability/ ESG or climate-related KPIs. <b>(Q.8a)</b></p>	<p>The board has already approved updating the remuneration policy to link executive compensation to meeting sustainability/ ESG or climate-related KPIs, however this has not been implemented yet. <b>(Q.8b)</b></p>	<p>The company has a remuneration policy approved by the board linking executive compensation to meeting climate-related KPIs. <b>(Q.8c)</b></p>	<p>The company has a detailed remuneration policy approved by the board linking executive compensation to meeting climate-related KPIs. Variable remuneration is dependent on meeting such KPIs. <b>(Q.8d)</b></p>

<p><b>B. STRATEGY</b></p>	<p>The company has no <b>strategy</b> or it has a strategy but it is not linked to risk assessment/appetite and/or no determined KPIs. <b>(Q.9)</b></p>	<p>The company has a strategy but it does not include sustainability/ ESG or climate-related strategic direction, policy or targets (KPIs). <b>(Q.10a)</b></p>	<p>Some sustainability/ ESG and climate-related aspects are reflected in the company’s general business strategy, policy or targets (KPIs). Monitoring of KPIs is on the board agenda on an <i>ad hoc</i> basis. <b>(Q.10b)</b></p>	<p>The company has a climate-related strategy or climate-related policy and climate-related targets in place, which are publicly communicated. There is evidence that the company consulted the latest external internationally recognized sources for relevant information.<sup>4</sup> <b>(Q.10c)</b></p> <p>The company explains how climate-related risks and opportunities are incorporated into its strategic priorities using sustainability / climate-related indicators that are regularly (quarterly) brought to the board’s attention. <b>(Q.10.1)</b></p>	<p>The company has a clearly defined, forward-looking and publicly available climate-related strategy, policy and targets together with performance measurement against the targets. Such strategy is aligned with the overall company’s business strategy and financial planning; <b>(Qs.10d and 10.1, 10.2)</b></p> <p>The company identifies transition, physical and liability climate-related risks and opportunities, and their impact on company’s business, strategy or financial planning; <b>(Q.10.1)</b></p> <p>The company’s strategy is resilient taking into account different climate-related scenarios <b>(Q.10.2)</b></p>
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<sup>4</sup> Sources could include: (Intergovernmental Panel on Climate Change Fifth Assessment Report (IPCC AR5), Physical risks: National Adaptation Strategies and/or Action Plans (NAS/NAPs), National Adaptation Programmes of Action (NAPAs), Nationally Determined Contributions (NDCs), Strategic Programmes for Climate Resilience (SPCRs)) Low Carbon: Nationally Appropriate Mitigation Actions (NAMAs), Task Force on Climate-related Financial Disclosures (TCFD) Final Report Transition Risks, Science Based Targets SBTi Criteria & Recommendations and Target Validation Protocol

<b>C. RISK MANAGEMENT AND PROCESSES</b>	The company has no <b>risk function. (Q.11)</b>	The company has a risk department but does not assess sustainability/ESG or climate-related risks and opportunities and the management is not kept informed about these issues. <sup>5</sup> <b>(Q.12a)</b>	The company conducts <i>ad hoc</i> assessments of sustainability/ESG with a focus on direct risks but does not have a process to assess on a regular basis climate-related risks and opportunities. <b>(Q.12b)</b>	The company has a process in place to assess climate-related risks and opportunities, including the use of multiple climate scenarios, for multiple timeframes to cover risks and opportunities. <b>(Q.12c and 12.1 – 12.4)</b>	Climate risk assessment process is integrated into the overall risk assessment process; both the risk and opportunity assessments are integrated into business planning and inform the business strategy, accompanied by a detailed action plan (embedded into the strategy with clear KPIs) and regular monitoring. <b>(Qs.12d and 12.1 – 12.4)</b>
	The company has no <b>risk metrics. (Q13)</b>	The company has a basic risk register. The company has not developed scenario analysis and has not perform climate stress tests. <b>(Q13.a)</b>	The company has a risk register and is in the process of developing metrics and tools to carry out scenario analyses and climate stress tests. The risk department develops basic scenario analyses and stress tests. <sup>6</sup> <b>(Q13.b)</b>	The risk department develops [and performs] scenario analyses and climate stress tests (transition and physical). <b>(Q13.c)</b>	The company carries out scenario analyses and climate stress tests (regularly/ on most value chains); it has developed and adopted an integrated risk management model to ensure management takes risk-informed decisions over different time horizons. <b>(Q13.d)</b>
	The company has no <b>internal audit. (Q.14)</b>	The company has an internal audit function but it does not have an internal process for validating the consistency and robustness of sustainability/ESG or climate-related data, information and reporting processes. <sup>7</sup> <b>(Q.14a)</b>	The company has an internal audit function and the validation of the consistency and robustness of sustainability/ESG and climate-related data, information and reporting processes is in the Internal Audit Plan, but no recommendations or actions by the board have been put forward. <b>(Q.14b)</b>	The company has an internal audit function and the validation of the consistency and robustness of climate-related data, information and reporting processes is in the Internal Audit Plan, and recommendations or actions have been put forward by the board. <b>(Q.14c)</b>	The company has an internal audit function and the validation of the consistency and robustness of climate-related data, information and reporting processes is in the Internal Audit Plan, and recommendations or actions put forward by the board have been acted upon;  Validation of climate-related data follows industry best practice and is at the same level

<sup>5</sup> Source of information – Risk Department organigram

<sup>6</sup> Source of information – Risk Department organigram

<sup>7</sup> Source of information – Company website and Annual Report

					of scrutiny as financial data. <b>(Q.14d)</b>
D. REPORTING, DISCLOSURE AND ENGAGEMENT	The company has no <b>website</b> . The company does not publish an <b>Annual Report</b> . <b>(Q.15)</b>	The company has a website and publishes its annual report but it does not report on sustainability/ESG or climate-related matters. <b>(Q.15a)</b> <sup>8</sup>	The company is reporting on some sustainability/ESG-related risks but not against one of the leading voluntary climate-related reporting frameworks (e.g. TCFD, CDSB, CDP, PRI, SASB). <b>(Q.15b)</b>	The company has reported against one of the climate-related voluntary frameworks (e.g. TCFD, CDSB, CDP, PRI, SASB) but its responses have not been validated externally. <b>(Q.15c)</b>	The climate-related disclosures are presented in a transparent and consistent manner, and in a decision-useful format; <b>(Q.15d)</b>  Consistency and robustness of the climate risk and opportunity reporting data and processes are validated through third party assurance; <b>(Qs.15d and 15.1)</b>  [And/or] The company has reported against one of the climate-related voluntary frameworks (e.g. TCFD, CDSB, CDP, PRI, SASB), and its responses have been validated both internally and externally. <b>(Q.15d)</b>
		The company does not disclose information related to <b>GHG emissions</b> externally. <b>(Q16a)</b>	The company discloses information on direct GHG emissions (Scope 1) and indirect GHG emissions from energy use (Scope 2). <b>(Q16b)</b>	The company discloses information on direct GHG emissions (Scope 1) and indirect GHG emissions from energy use (Scope 2), [as well as all Scope 3 emissions] externally using internationally recognised methodologies and guidance. <b>(Q16c)</b>	The company discloses Scope 1 and 2 emissions as well as all Scope 3 emissions from its full value chain externally, including all upstream and downstream processes. The disclosures are forward-looking, presented in a transparent and consistent manner, and in a decision-useful format. <b>(Q16d)</b>
		The company does not disclose on <b>climate-related risks and opportunities</b> . <b>(Qs.17a and 18a)</b>	The company partially discloses information on transition and physical climate risks using internationally recognised	The company fully discloses quantitative and qualitative information on transition and	The company fully discloses transition and physical risks and opportunities using internationally recognised

<sup>8</sup> Source of information – Company website and Annual Report

			methodologies and guidance. <b>(Qs.17b and 18b)</b>	physical climate risks. <b>(Qs.17c and 18c)</b>	methodologies, including quantification of past and future impacts and implications for the long-term operation of the company. <b>(Qs.17d and 18d)</b>
	The company does not disclose its corporate governance structure and management of sustainability/ESG and climate-related risks. <b>(Q.19a)</b>	The company makes generic statements about sustainability/ESG governance but it does not specifically describe governance of climate-related issues. <b>(Q.19b)</b>	The company discloses some details of corporate governance around climate-related risks and opportunities, including disclosing at least 3 of the following: <ul style="list-style-type: none"> <li>- how the board and senior executives are engaged on climate risks and opportunities;</li> <li>- what metrics and targets are used to identify and manage climate-related risks and opportunities;</li> <li>- whether and how executive compensation is tied to meeting corporate climate objectives;</li> <li>- how senior management and the board monitor and gauge the effectiveness of the Company's climate change strategies and goals.</li> </ul> <b>(Q.19c)</b>	The company discloses its corporate governance around climate-related risks and opportunities (all points from Level 3) and provides information about material climate risks and opportunities related to company's suppliers, operations, markets. <b>(Q.19d)</b>	
The company does not have a dedicated function for engagement with shareholders or stakeholders. <b>(Qs .20 and 21)</b>	The company does not engage with its <b>shareholders</b> on sustainability/ESG or climate-related issues. <b>(Q.20a)</b>	The company engages with its shareholders by providing generic information on sustainability/ESG and/or climate-related issues in an annual report or sustainability report. <b>(Q.20b)</b>	The company engages with its shareholders by providing detailed information on climate-related issues in the annual report or sustainability report. <b>(Q.20c)</b>	The company regularly engages with its shareholders by informing them of climate-related issues in financial reports, by making strategy presentations and by raising these issues in AGMs. <b>(Q.20d)</b>	

		<p>The company does not engage with <b>stakeholders</b> on sustainability/ ESG or climate-related topics and their impacts, risks and opportunities. <b>(Q.21a)</b></p>	<p>The company engages with stakeholders on general sustainability/ESG and/or climate-related issues. <b>(Q.21b)</b></p>	<p>Stakeholder consultation is used regularly to identify and manage sustainability/ ESG as well as climate-related risks and opportunities. <b>(Q.21c)</b></p>	<p>The company holds stakeholder consultation that is dedicated specifically to climate risks and opportunities to inform the board and executive management. Results are communicated to external stakeholders in a transparent way. <b>(Q.21d)</b></p>
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