CHINA ECONOMIC INFORMATION SERVICE

CEIS中经社



中亚企业
ESG卓越实践案例集

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前言

中亚，古丝绸之路的重要枢纽，也是共建“一带一路”的首倡之地。在这片资源富集且生态敏感的土地上，能源矿业开发、基础设施建设尤需超越短期经济回报，转向对自然与社区的长期承诺。我们欣喜地看到，越来越多深耕中亚的企业将项目建设与生态保护同步推进，并积极投身当地的教育医疗和民生改善；中国的清洁技术与数字化管理经验正在为中亚绿色转型提供巨大助力……这些正是“一带一路”合作共建所追求的“高标准、可持续、惠民生”的目标与ESG可持续发展理念深度融合结下的硕果。企业不仅是工程的建设者，更是绿色标准的执行者、社会责任的担当者、严谨治理的示范者。

站在新的历史节点上，中国经济信息社与“一带一路”绿色发展国际联盟共同编写这本《中亚企业ESG卓越实践案例集》，不仅是为了记录企业在中亚地区推进绿色低碳发展的努力与创新，也期待为新时代的中国—中亚企业合作勾勒一幅可持续的生态图谱。

本案例集共收录13个具有代表性的ESG优秀实践案例，覆盖荒漠化治理、可再生能源、智能制造、注重生态保护的互联互通、清洁生产、教育赋能、劳动者保障与公众参与制度创新等多个维度。

案例集力求呈现三条主线：一是技术驱动，如何通过光伏、风电、储能、智能建造等关键技术，将传统能源重地转化为清洁能源高地；二是机制创新，如何通过社区共建、公众参与以及劳动者保护方式的拓展，将共建共享理念融入项目全周期；三是责任融合，如何将生态保护、碳排放管理、生物多样性、人才培养、民生改善等社会责任要素系统纳入企业决策与项目运营，真正实现经济、社会与环境效益的统一。

本案例集旨在以客观、严谨、可比的方式，向国际同行提供来自中亚企业ESG实践样本，为各国政府、行业协会、研究机构、企业及投资者理解中亚绿色转型的真实进程提供参考，为深化中国与中亚乃至更广泛区域的绿色低碳合作贡献智慧与方案。

我们期待本案例集能够成为一座桥梁，连接政策制定者、产业实践者与学术研究者，在丝绸之路上共筑繁荣、绿色、包容的新生态，让古老的合作精神在新时代焕发更加璀璨的光芒。

中国经济信息社

“一带一路”绿色发展国际联盟

2026年7月

白色巨人立天地
札纳塔斯沐光行

哈萨克斯坦南部札纳塔斯的戈壁上，巨大的白色风车迎着草原长风缓缓转动，叶片划破晴空的轻响，与不远处游泳池里孩子们的嬉闹声汇成了动人的夏日乐章。曾经这里电力供应非常紧张，夏日的夜晚常常陷入漆黑；如今，源源不断的绿色电力从风车下的戈壁滩输往四面八方，点亮了20万个家庭的灯火，也让这片土地焕发了新的生机。

从札纳塔斯的100MW级风电项目2021年全容量并网，到阿克莫拉州221MW风电群一期、二期、三期先后连续刷新中亚风电项目群纪录，一座座风车在哈萨克斯坦的草原与戈壁上拔地而起。这是中哈绿色能源合作共建的硕果。截至2025年底，这些由国家电力投资集团有限公司投资的中哈绿色项目在运总装机已达611MW，约占哈萨克斯坦可再生能源总装机的16.77%，每年累计发电量近21亿千瓦时，减少二氧化碳排放近200万吨，不仅有效缓解了南部地区跨区输电的压力，更成为当地能源低碳转型的核心支撑。项目不仅促进了哈萨克斯坦储能行业三大核心标准的发展，还直接推动当地首个储能项目与彩色光伏技术落户。



国家电投为札纳塔斯小镇捐建的游泳池

绿色风电落地润泽民生。在推进风电建设的同时，项目团队连续6年累计投入300万元人民币（1元人民币约为69坚戈），为周边社区捐建游泳池、文化广场和林荫大道，修缮残障妇女与多子女家庭的住房，在洪灾中更是第一时间向周边群众伸出援手，项目建设期间累计提供了2000多个就业岗位；投运后逾100个稳定岗位中属地员工占比近90%，札纳塔斯等偏远小镇的居民实现了在家门口的稳定就业，给当地产业经济带来了新面貌。项目方还联合哈萨克斯坦高校建立人才联培机制，通过“结对子”师徒模式培养出了哈萨克斯坦能源部“优秀电力工程师”。



国家电投哈萨克斯坦能源投资公司协办中哈文化交流活动

从建设之初的联合环评避开生态敏感区，到运营期固废分类处置实现污染物零排放，再到每年持续开展的鸟类观察与环境监测，项目始终将生态保护放在首位，监测数据全部合格。这些扎根中亚的绿色实践，成为“一带一路”上中国与中亚国家携手共赢的生动注脚。

长风万里，绿意绵延。转动的风车不仅输送着清洁电能，更传递着中哈两国世代友好的情谊，为古老的丝绸之路增添了动人的“绿意”。

（国家电投哈萨克斯坦能源投资公司报送）

“新能源+储能”转动发展希望之轮

乌兹别克斯坦西北部，努库斯市东南约70公里的卡拉托山区，荒漠戈壁一望无际。这里夏季酷热、冬季严寒，电力基础设施薄弱，居民长期面临供电不稳的困扰。如今，26台高140米的白色风电机组如巨人般矗立在山脊之上，叶轮迎风旋转，将戈壁的风能化为源源不断的绿色电力。

这就是中亚地区新能源开发的标志性工程之一——努库斯200兆瓦风电及100兆瓦时储能项目。项目配置26台单机容量8.0兆瓦的风力发电机组，轮毂高度140米，配套建设升压站、储能站及输电线路。风电作为零排放清洁能源，项目全部投运后可大幅替代化石能源，每年减少大量燃煤发电，有效降低二氧化碳、二氧化硫及氮氧化物排放。同时配套的储能系统可有效提升新能源消纳能力，进一步提高风能利用效率。

项目的施工建设非常注重生态保护。前期就开展生态调查，识别重点保护物种及活动路径，制定针对性保护措施；施工前引导保护动物迁徙；在关键生态区域设置缓冲区，调整施工时间避免对繁殖期造成干扰。针对沙漠陆龟这一当地受保护物种，项目建设方专门聘请生态专家定期监测，一旦发现立即启动“偶然发现机制”，进行专业观测评估，并最大限度减少对其栖息环境的干扰。此外，在局部施工区段完工后，随即系统性开展植被恢复与土地复垦工作。



项目生态专家对野生沙漠陆龟进行保护性处置与持续跟踪监测

项目建设过程中，严格执行资源节约原则。风机布置结合山脊与通风走廊地形，减少对原始地貌的破坏；道路设计采用最小扰动原则，实现工程建设与自然环境的协调；施工中洒水抑尘、覆盖防护控制扬尘，运输车辆密闭管理，机械定期排放检测；废弃物分类管理，钢材、混凝土等可回收材料也实现了再利用。在严格的环境和资源管控制度下，项目对土地的扰动显著降低，扬尘得到有效控制，项目周边生态环境得到了妥善的保护。

努库斯风电及储能项目建设与运营不仅为当地提供了新型产业和就业岗位，也带动了周边交通、服务业的发展。项目团队主动走访社区，与社区管理层面对面沟通，围绕属地协同及带动本地就业深入探讨，形成了非常良性的互动和良好的社企关系。项目建设方还非常重视本地化人才培养，通过“以工代训”“岗位培训”等方式提升当地员工专业技能，实现技术有效传递，为乌兹别克斯坦新能源产业储备了一批专业人才。



项目团队主动走访当地社区，围绕属地协同发展深入交流

项目建设同步完善了周边道路、电力等基础设施，新建及改造进场道路与场内道路，提高了区域交通通达性与供电稳定性。项目环境与社会团队还联动当地高校与政府部门，组织开展交流讲学活动，围绕职业教育、职业发展规划等主题进行系统性宣讲，为当地学生职业成长提供切实支持。

凭借工程质量、安全生产及社会责任等方面的突出表现，努库斯风电储能项目荣获当地住建部颁发的优秀项目奖。

从荒漠戈壁到绿色能源基地，努库斯风电储能项目以“新能源+储能”的创新模式，实现了清洁能源开发与生态保护、社区民生改善的有机协调。中乌两国企业携手转动的不仅是钢铁叶片，更是中亚大地绿色发展的希望之轮。

（中国电建集团华东勘测设计研究院报送）

科技无边
未来相连

乌兹别克斯坦纳沃伊州的广袤戈壁上，湛蓝天空下，一排排深蓝色光伏板在阳光下熠熠生辉，全自动智能安装机器人的机械臂精准舞动，以毫米级精度完成每一块组件的安装。曾经这里是人迹罕至的荒漠，电力供应依赖远距离输送；如今，智能建造的科技力量正在这片土地上书写绿色能源新篇章，清洁电力将从这里源源不断输往千家万户。

这是中乌绿色能源与智能建造深度融合的标志性工程，由中国能源建设集团子公司中能建海外投资有限公司投资建设的纳沃伊光伏项目。项目规划建设300兆瓦光伏电站及150兆瓦/300兆瓦时储能系统，是中亚地区首个应用光伏组件全自动智能安装机器人的新能源项目。项目建成后将有巨大的环境收益：年均可提供约7.5亿千瓦时清洁电力，每年减少二氧化碳排放约161万吨，为乌兹别克斯坦能源转型和电力安全注入稳定可持续的绿色动能。

人工智能建造是该项目的一大亮点。项目在关键施工环节引入了智能建造技术，依托高精度机械臂、视觉识别系统和多传感器融合技术，光伏组件全自动智能安装机器人实现了全天候、高效率、高一致性的标准化作业。与传统人工安装相比，一台机器人每天可安装700-800块光伏组件，是6人班组作业效率的2倍以上，安装精度达毫米级，一次成功率超99%。智能建造技术的应用，使项目关键路径工期缩短30%以上，综合安装效率和工程质量实现质的飞跃。

项目建设方践行“授人以渔”的理念。项目坚持技术引入与本地培训相结合，通过“结对子”师徒模式和系统技术培训，为当地培养了掌握智能运维和技术管理的本土工程师。年轻的乌兹别克斯坦工程师马哈茂多夫·穆罗季永经过中方工程师系统培训，已能熟练操作和监控机器人运行。像他一样的本土技术人才正在项目建设中快速成长，先进智能建造技术不仅带来效率提升，更在当地“落地生根”，为乌兹别克斯坦新能源产业发展积蓄人才力量。



纳沃伊光伏项目属地机器人操作手

开放共享，凝聚共识。纳沃伊光伏项目创意举办了以“看得见的绿色能源 摸得到的智能建造”为主题的公众开放日活动，来自乌兹别克斯坦政府机构、行业组织、高校、媒体及社区代表近百人走进项目现场，实地感受增进了解和共识。光伏项目智能建造实践示范基地正式揭牌后，作为面向政府、行业和高校的开放平台，集中展示光伏智能安装、数字化施工管理和智能装备应用成果，为中亚地区新能源工程探索智能化建设路径提供了可复制可推广的实践样本。



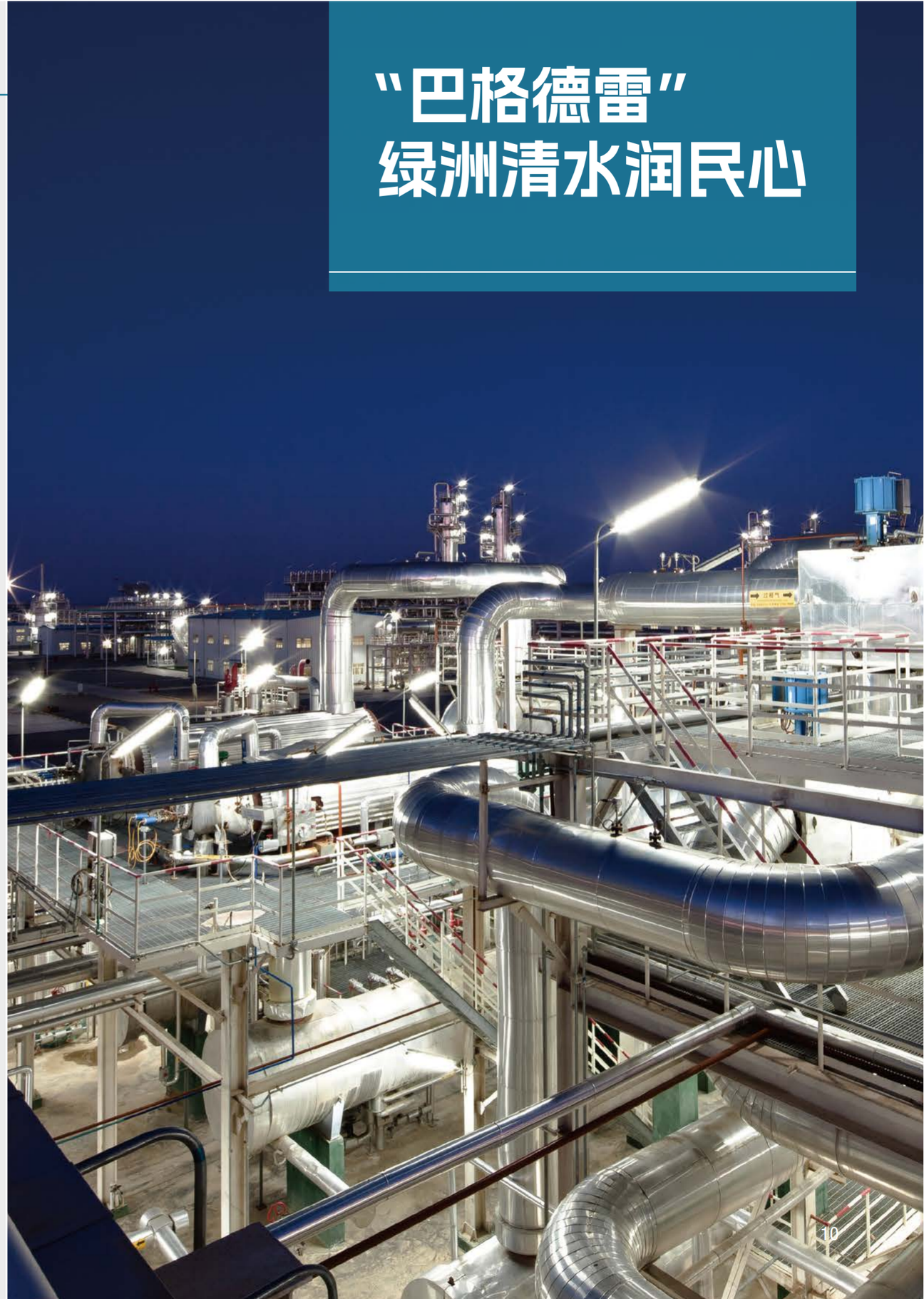
纳沃伊光伏项目公众开放日签到现场

从戈壁荒漠上的精准施工，到智能建造技术的示范推广，再到本土人才的系统培养，纳沃伊光伏项目将科技创新与绿色发展融为一体。智能建造扎根中亚大地的绿色实践，正成为“一带一路”上中乌携手推动绿色低碳发展、培育新质生产力的生动缩影。

科技无界，绿意相连。智能建造的科技之光正与绿色能源的发展之力交相辉映，在古老丝绸之路上点亮可持续发展的未来，为共建绿色丝绸之路、深化中乌新时代全天候全面战略伙伴关系注入源源不断的创新动能。

（中国能建海投公司报送）

“巴格德雷”绿洲清水润民心



土库曼斯坦卡拉库姆沙漠腹地，绿树成荫的营地，汩汩清流滋养着草方格织就的绿色屏障。在这个被称为巴格德雷（Bagtyýarlyk，在土库曼语中意为“幸福之地”）合同区的地方，曾经饱受饮水之困的村民，如今拧开水龙头就有洁净的自来水。

2007年启动的阿姆河右岸天然气项目，占地1.43万平方公里。这个连续11年实现千万吨油气当量高产稳产的项目，始终将生态保护置于突出位置。建设者们针对气田产水增加的实际情况，搭建闭环式污水处理体系，分区建设9座处理站，日处理污水3600立方米，经油水分离、药剂浮选、精滤等多级处置，出水含油量、悬浮物、硫化氢均控制在10mg/L以下。营地生活污水从“达标排放”升级为“资源化回用”，年节水上千吨，已纳入土库曼斯坦环保优秀案例并专项推广。

在脆弱的荒漠生态中，项目执行“一条路”管控，落实“有作业现场就有绿化”，种植耐旱植被、修建草方格固沙，荒漠逐步转为生态宜居之地，营地被当地居民誉为“绿色中国城”。温室气体管控方面，项目通过甲烷泄漏检测、精准调控火炬用气量、安装废热蒸汽回收等措施，在联合国环境规划署多次现场监测中持续达标。

注重人才培养为项目可持续发展提供了重要支撑。项目每年选拔并全额资助一批土库曼斯坦优秀学生赴中国石油大学深造，已有上百名学生从这里毕业。如今，他们已成长为土库曼斯坦石油行业的骨干人才。同时，项目方累计在本地培训近7000人次，其中逾百人成为项目管理骨干；与卡卡耶夫国际油气大学共建“鲁班工坊”，每年组织师生互访。此外，项目方每年投入约120万美元用于社会公益与义务培训，逐步形成本土人员有序接替的用工格局。



污水处理装置

项目方出资359万美元援建的米干村水厂，解决了5000余名村民安全饮水问题，被该国媒体誉为“丝绸之路经济带”民生合作典范。



土库曼斯坦各方代表参加米干村水厂开工庆典

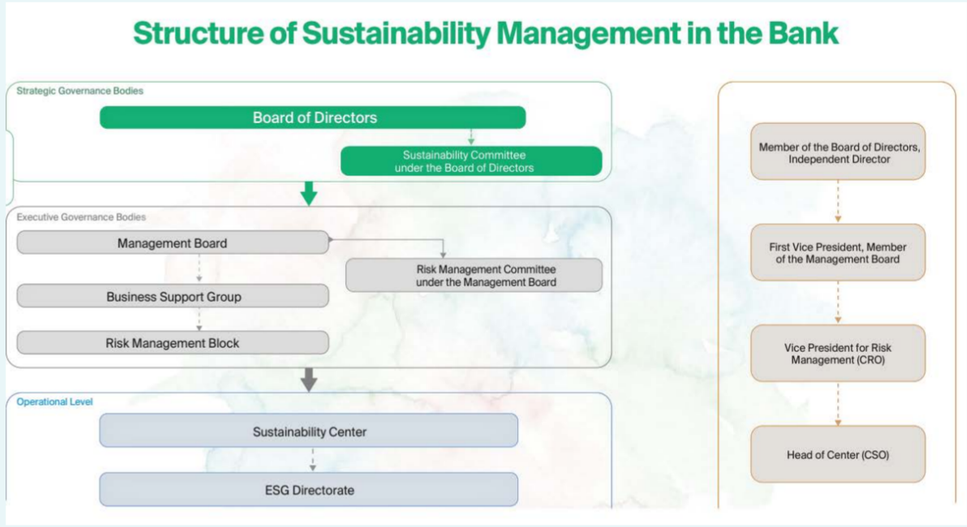
阿姆河右岸天然气项目扎根大漠的实践证明，能源开发与生态保护、社区发展可以实现协同推进。从卡拉库姆沙漠输出的不仅是天然气，更是海外能源项目绿色发展、属地共赢、人才共育的实践探索。

（中石油阿姆河天然气勘探开发（北京）有限公司报送）

绿金汇丝路
责任润中亚

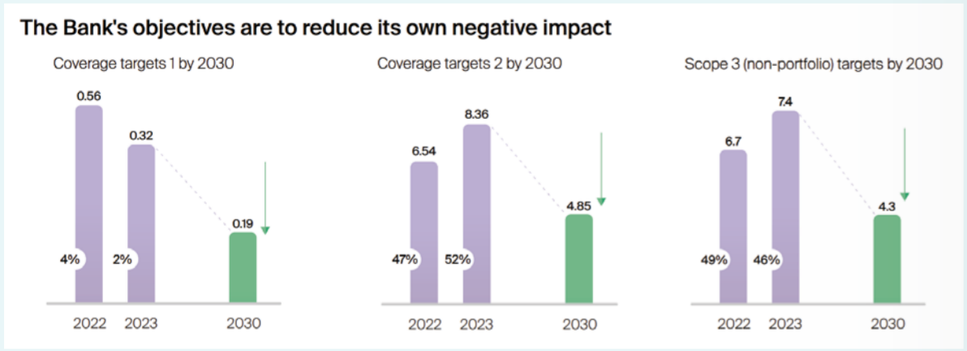
centercredit

在哈萨克斯坦辽阔的中亚大地上，一场静水流深的变革正在金融领域悄然展开——它不新建高楼大厦，也不铺设输油管道，而是用一套全新的“绿色语言”重新定义了银行与经济社会的关系。这就是JSC Bank CenterCredit（中央信贷银行）自2023年启动的系统性ESG转型。从零散的公益项目到制度化的可持续发展管理体系，从传统的信贷审批到涵盖气候与环境风险的全流程绿色金融，该行用短短两年时间，完成了中亚银行业一次具有标杆意义的绿色蜕变。



中央信贷银行可持续管理架构图

转型的第一步是“立规矩”。2023年，JSC Bank CenterCredit在全行范围内开展ESG成熟度评估，随后在董事会下设可持续发展委员会，由持有国际SCR气候风险管理认证的专家担任主席，将ESG关键绩效指标纳入中高层管理人员的考核体系。与此同时，可持续发展政策、反腐败政策、人权政策等一系列制度相继出台，ESG不再是一项“锦上添花”的口头倡议，而成为嵌入公司治理结构的硬性要求。在战略层面，JSC Bank CenterCredit于2024年率先在中亚银行业批准了面向2050年的气候战略，承诺到2030年将国际公认的《温室气体核算体系》范围一、二、三的温室气体排放较2023年基准减少42%。



Dynamics of uniform growth of the BCC green portfolio to achieve the goals by 2030. (Unit: billion tenge)

	2025	2026	2027	2028	2029	2030
The volume of the green loan portfolio	120	163	212	268	331	400

中央信贷银行减排目标

绿色金融是这场转型最直观的“成绩单”。至2025年底，该行绿色信贷组合已达1519亿坚戈（1人民币约相当于69坚戈，下同），同年9月，成功注册首期1000亿坚戈绿色债券并在哈萨克斯坦证券交易所挂牌。在与欧洲复兴开发银行合作的绿色经济融资机制框架下，累计推动年减排二氧化碳超过170万吨。JSC Bank CenterCredit也是哈萨克斯坦首家购买I-REC国际可再生能源证书的二级银行——2024年购入1000兆瓦时，2025年增至2200兆瓦时，以实际行动对冲自身运营用电的碳足迹。此外，2025年该行在咨询机构CBI协助下制定了绿色金融政策，并获阿斯塔纳国际金融中心绿色金融中心的独立评估，取得了国际资本市场协会绿色债券原则的最高合规等级。

JSC Bank CenterCredit社会责任担当同样扎实有力。该行拥有8000多名员工，女性占比65.2%，管理层女性比例达54%。全行推行目标管理绩效体系，并引入“工作与生活平衡”理念与哈萨克斯坦在线心理平台Sezim合作，为员工提供专业心理咨询服务；在办公场所设立免费健身中心，倡导健康文化。面向社会，该行自2023年起连续支持全国性生态教育运动TURAQTY JOL，覆盖受众超过2万人，回收废弃物4吨，栽植树苗约100株。2024年哈萨克斯坦西部遭遇特大洪灾时，该行拨款55亿坚戈用于受灾家庭住房重建。同时参与全国性金融扫盲项目“Karyzsyz kogam”，为负债人群提供法律援助与债务重组。三年来，社会投资累计超过101亿坚戈。

信息披露是ESG公信力的基石。JSC Bank CenterCredit连续两年发布可持续发展报告，严格遵循GRI、SASB、TCFD标准及哈萨克斯坦金融监管局建议，并由毕马威独立鉴证关键指标。第二份报告更进一步，纳入了IFRS S1和S2披露要求，扩大集团层面披露边界。该行先后荣获哈萨克斯坦证券交易所“金融业最佳可持续发展报告奖”和普华永道“金融机构最佳ESG披露奖”，并入选普华永道哈萨克斯坦ESG评级前十。在国际舞台上，JSC Bank CenterCredit的标普全球CSA评分从2023年的61分跃升至2025年的75分。2023年，该行正式加入联合国全球契约，标志着其ESG治理与国际标准全面接轨。

从董事会的一纸决议到1500多亿坚戈的绿色贷款，从员工心理关爱热线到联合国全球契约的庄严承诺，JSC Bank CenterCredit的ESG转型实践表明：在新兴经济体中，金融业完全可以成为可持续发展的核心引擎。当绿色金融的标准被写入信贷审批系统，当气候风险的考量融入一笔贷款决策，一个更具韧性的中亚绿色金融生态正在加速形成。这条绿金丝路，既是资本流动的通途，更是责任与未来的纽带。



中央信贷银行标普全球CSA评分(2025)

（哈萨克斯坦中央信贷银行报送）

点燃希望炉火，为古城添四时清新

乌兹别克斯坦撒马尔罕的城郊，垃圾焚烧发电项目建设如火如荼。很少有人想到，未来这里将会拔地而起一座“花园式工厂”，处理全州400万人口产生的生活垃圾，并将之转化为清洁能源，助力改写这座千年古城的环境治理面貌。

2025年4月，项目正式启幕，为这座千年古城提供破解困局的钥匙。项目建成投产后，具备1500吨/日的生活垃圾处理能力，一年可消纳50余万吨废弃物，转化出3.83亿千瓦时的清洁电能，撒马尔罕的垃圾治理将实现从“简易填埋”到“能源化、资源化”的跨越。

项目带来的不只是一座工厂，还有一整套适合中亚的绿色治理方案。核心焚烧设备适配中亚的气候特征与垃圾成分；精准的自动控制系统稳住炉内工况，在高效燃烧的同时抑制有害气体生成，烟气排放达到国际标准，生产污水经处理后全部闭环回用；全厂发电效率突破30%.....每一项指标都在守护生态底线。简易填埋场刺鼻的异味将逐渐消失，被污染的水土也将慢慢恢复生机。

比技术更动人的是项目方融入当地的诚意。早在项目规划阶段，建设团队就把社区沟通放在了最优先事项——联合当地政府组织居民与媒体跨越万里，走进中国的样本项目实地参访，让“花园工厂、近零排放”从传闻变成了亲眼所见的事实。疑虑在坦诚中消解，抵触化作了支持，潜在的邻避顾虑，最终变成了民众对美好生活的共同期待。更长远的绿色种子播撒在校园里：项目方与卡尔希国立大学等本地高校携手，定向培养、技术交流、岗位实习，让一批年轻学子在家门口学到了固废处理技术，为乌兹别克斯坦培养了环保产业人才。

从设计、选址到建设，项目全流程与区域需求深度相融，让中国低成本高效益的绿色治理技术和经验，在中亚的土地上开花结果。中方项目负责人受聘为乌兹别克斯坦环保部长顾问，助力该国搭建契合国情的行业规范。



项目举行高校开放日活动

乌兹别克斯坦总统发来的感谢信，是对这个项目厚重的褒奖。这座垃圾发电厂是中乌环保合作的项目实践，亦是共建绿色丝绸之路的生动写照。



O‘ZBEKISTON RESPUBLIKASI
PREZIDENTI

“SUS Environment” компанияси раиси
Цзишэн Лун Жаноблариga

Хурматли Лун Жаноблари!

Ўзбекистон Республикасининг миллий байрами – Мустақиллик куни муносабати билан йўллаган самимий табрик ва билдирган эзгу тилакларингиз учун Сизга ўзимнинг чуқур миннатдорлигимни изҳор этаман.

Сиз бошқараётган компания бундан кейин ҳам юртимиз иқтисодиёти ривожига муносиб ҳисса қўшишига ва “яшил” энергетика соҳасида янги лойиҳаларни самарали амалга оширишига ишончим комил.

Фурсатдан фойдаланиб, Сизга мустаҳкам соғлиқ, оилавий бахт-саодат, фаровонлик, шарафли ишларингизда улкан муваффақиятлар тилаб қоламан.

Ҳурмат билан,

Шавкат Мирзиёев

Тошкент шаҳри,
2025 йил 1 сентябрь

感谢信

（康恒环境报送）

“我们不是过客，而是哈萨克斯坦大家庭的一员”



一座座现代化的厂房在哈萨克斯坦巴甫洛达尔市市郊静静伫立。令人意外的是，这些矿业生产设施整洁、亮眼，并非人们传统印象中的“高排放、高污染”的景象。余热发电、水循环利用、生态修复等环保技术贯穿于工厂生产的全周期。中色股份（NFC）及中色哈萨克有限责任公司（以下统称“NFC”）扎根当地近二十年，在助力哈萨克斯坦改写有色金属工业历史的同时，致力于为中亚传统矿业发展找到绿色转型的有效路径。

2005年NFC承建的巴甫洛达尔电解铝厂，填补了哈萨克斯坦独立后这一行业制造企业的空白，终结了该国完全依赖进口铝锭的历史，也让当时世界领先的电解铝核心技术在本土落地生根。随后，巴夏库与阿克托盖两大世界级铜矿选矿工程也相继建成，项目集成国际先进的大型装备与自动化控制系统，使哈萨克斯坦铜精矿生产能力跃居全球前列。这些工程被哈萨克斯坦业界誉为“载入史册的旗舰项目”，先后斩获中国国家优质工程银质奖、哈萨克斯坦国家工程奖及“金鹰质量奖”等国内外奖项。



哈萨克斯坦巴夏库铜矿选厂

在推动哈萨克斯坦有色金属产业跃升的同时，NFC协助业主企业将越来越多的可持续发展理念融入到传统矿业生产中。巴夏库和阿克托盖铜矿选厂项目除了大量采用自动化控制系统、先进生产技术和设备，在高产能与低能耗方面有了巨大的提升，还有诸多绿色发展的亮点：首先，选厂设计充分考虑哈萨克斯坦水资源相对紧缺的问题，建设尾矿库回水系统和生产循环水系统，尾矿沉降后的回水重新返回生产流程，实现生产用水循环利用，有效降低新鲜水取用量，同时减少尾矿排水对周边环境的影响；其次，项目按照国际标准发布环境绩效数据，将环境保护纳入企业日常运营管理体系，推行全过程环境管理，实现矿山开发与生态保护并重；此外，企业对矿山土地复垦、植被恢复及矿山闭坑后的生态修复均制定长期规划，并为矿区自然生态改善提供切实资金保障。企业近年来单位硫化矿处理能耗已稳定在约0.19太焦耳/千吨矿石的国际先进水平，践行了现代大型矿山绿色高效开发理念。

真诚本地化，为企业赢得长久的信任。NFC累计为当地创造超过10000个工作岗位，并长期为社会福利院儿童和残疾人家庭、老年困难群体捐资捐物，以及提供社区生活设施修缮服务。阿克托盖项目就入选联合国工业发展组织中国建筑业企业社会责任项目优秀案例。公司管理层常说：“我们不是过客，而是哈萨克斯坦大家庭的一员。帮扶弱势群体、支持教育、关爱下一代，是应尽之责。”



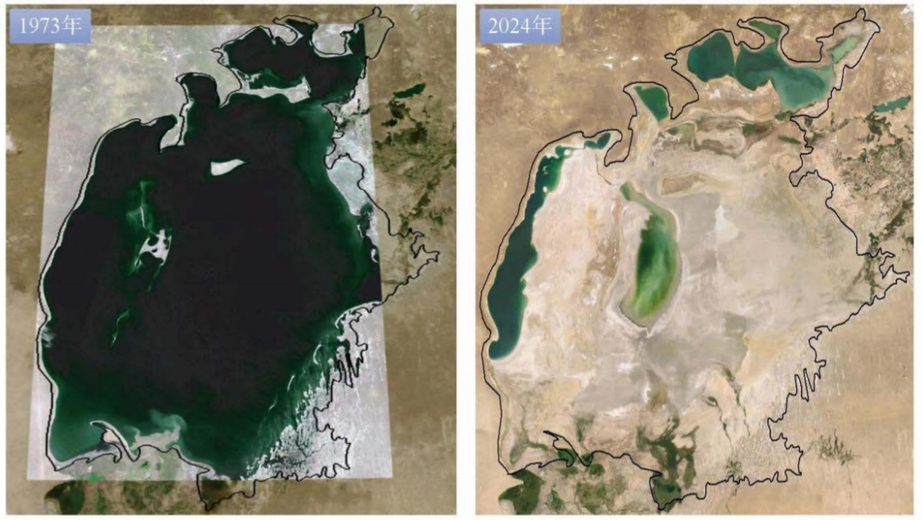
NFC收到的感谢信

从哈萨克斯坦第一台铝电解槽到世界级铜选冶工程，从余热发电的绿色创新到为社区修缮排水系统……建设者用实践创新和热情真诚，刻下了中哈“责任”与“友谊”的印记。正如哈萨克谚语所言：“滴水汇聚，可成江河。”这些平凡而持续的付出，正为中哈携手实现绿色转型注入生生不息的暖流。

（中色哈萨克有限责任公司报送）

咸海绽棉白
光伏绘新绿

曾经被称作“中亚之泪”的咸海，干涸湖床上盐尘随风漫天飞舞，盐碱地荒芜连片，恶化的生态成为这片土地深深的伤痛。



数据来源：谷歌地球和arcgis online

咸海水面变化遥感影像对比图

如今这里却有了不一样的景象：在乌兹别克斯坦努库斯市的示范田里，雪白的棉花缀满枝头，整齐排列的光伏板在阳光下熠熠生辉，智能滴灌管带将水肥精准输送到每一株作物根部；穆伊纳克的盐生植物园里，梭梭、盐角草扎根盐碱地，昔日寸草不生的土地正焕发出勃勃生机。中国科研团队带来的“光伏+棉花水肥一体化”技术，正在咸海之畔书写生态治理与民生改善的双赢答卷。

2023年，中国科学院新疆生态与地理研究所联合新疆能源化工集团阿克苏有限公司在乌兹别克斯坦努库斯市咸海国际创新中心建成首个节水灌溉棉花示范基地，引入新疆覆膜滴灌、水肥一体化技术。示范田籽棉产量达到每公顷5吨，是当地平均产量的2.5倍，灌溉用水量仅为常规耗水量的三分之二。这一高产与节水的双重突破，吸引当地农民与农业专家纷纷观摩。

2024年，项目实现重要技术升级。在覆膜滴灌基础上，科研团队加装光伏系统与智能水肥一体机，实现灌溉施肥的自动化精准管控。光伏驱动的水泵从地下取水，经滴灌管道输送至每株作物根部，盐碱地籽棉产量达到当地平均水平的2至3倍。按当地籽棉收购价计算，示范田每公顷产值超过3354万索姆，较传统种植增收200%以上，有力验证了盐碱地农业开发的经济可行性。

与此同时，项目团队在穆伊纳克建设“光伏+生态”盐生植物园，利用光伏水泵抽取地下水，培育盐角草、梭梭、盐爪爪等十余种耐盐植物，兼种耐盐牧草。中方还提供1.5吨盐生植物种子，助力当地盐碱地治理。如今园中耐盐植被长势良好，土壤盐分明显下降，为咸海流域盐碱地治理提供了可复制、可推广的范例。

突出的生态效益为项目赢得了良好的社会影响力。乌兹别克斯坦卡拉卡尔帕克斯坦共和国最高议会主席Amanbay Orinbayev专程致信，对中国科研团队运用先进技术助力当地应对环境挑战表示感谢。当地技术员Ismail Asanov称，项目实现了棉花高产，希望继续学习这些先进的技术来改良环境。政治观察家沙罗菲丁·图拉加诺夫评价道，项目兼顾了生态治理、民生改善与互信提升。



穆伊纳克盐生植物园兼种耐盐作物，当地农民进行田间管理

为推动技术走向产业化、本土化，中乌双方持续开展光伏电站运维、节水灌溉等技术培训，提升当地人员专业能力。2025年，项目新增芝麻种植，进一步验证“光伏+油料作物”模式，乌方表示愿出资将示范面积扩大至100公顷，推动技术从试验田迈向规模化应用。

2024年4月，项目入选国家国际发展合作署全球发展项目库。2025年5月，作为“咸海流域可持续发展国际计划”核心成果，入选联合国《科学促进可持续发展国际十年》首批清单并在纽约联合国总部展出，国际影响力提升至全球层面。

从“中亚之泪”到“绿色希望”，咸海之畔的棉田见证了中国科技的温度。光伏板下，滴灌管道静静输送着水和养分；盐生植物园里，耐盐牧草随风摇曳。这片曾经荒芜的盐碱地，正成为中国—中亚命运共同体的一抹亮色。

（中国科学院新疆生态与地理研究所报送）

戈壁“长龙”绘就低碳新图景



沿着中国—中亚天然气管道乌兹别克斯坦段一路前行，一道道错落的绿带顺着管线绵延铺展，沙枣树、榆树与梭梭树扎根贫瘠土地，草方格牢牢锁住流动沙丘；压气站内余热流转、机组智能联动，天然气源源不断输送至城乡千家万户。中亚腹地，一条兼顾能源保供、荒漠治理与低碳减排的绿色通道，正在乌兹别克斯坦广袤戈壁上徐徐铺展。

这条管道的建设运营紧扣乌兹别克斯坦的全国性绿色空间倡议，以“绿洲—绿带—绿态”三步走规划，在荒漠之中书写生态共生答卷。针对沿线流沙侵蚀管道、植被难以存活的难题，项目借鉴中国治沙经验，铺设22万平方米草方格固沙，严格限定施工作业范围，完工后播撒草籽修复地表。以UCS3站为核心的12.5公顷绿化区，科学配套节水灌溉系统，精选耐旱适生苗木，累计栽种树苗万余株，搭配季度施肥、病虫害防治、定期补种的精细化管护，让荒漠空地蜕变为生机盎然的生态屏障。十余年间，管道沿线累计栽植近3万株树木，每年固碳约370吨，降尘效率提升三成以上，飞鸟重返林间栖息，荒漠逐步恢复生机。



站场联合运行图

项目的绿色发展不止于治沙造林，更藏在每一处工艺革新之中。立足节能降耗、减碳增效目标，项目落地多项低成本技改方案：改造压缩机组控制逻辑，停机切换保压模式，杜绝天然气放空损耗；打通相邻压气站供电、空压机系统，共享设备负荷，大幅削减燃气自耗与电力消耗；搭建三线跨接管线，动态调配输气量，优化机组运行负荷，每年节约自耗气超1500万立方米。全线21台燃驱机组配套余热锅炉，回收高温烟气热量用于冬季供暖，同步推进余热发电技术研发，深挖循环利用潜力。投产至今，管道累计输气近5000亿立方米，替代大量煤炭，大幅削减二氧化碳、二氧化硫排放，实现能源输送与低碳发展共赢。

扎根当地的绿色实践收获了各方赞誉。成片绿带改善站场人居环境，温室大棚培育果蔬绿植，为一线员工打造戈壁宜居家园。乌兹别克斯坦《东方真理》、《自然》报刊多次报道项目的环保成果，纳沃伊州生态部门发来表彰函，高度认可企业为当地荒漠化治理、绿色经济作出的突出贡献。2021年项目取得ISO26000社会责任认证证书，成为践行可持续发展的标杆。





乌国布哈拉、纳沃伊州政府关于绿带建设表彰函



ISO 26000（社会责任指南）证书

面向未来，这条丝路气脉还将持续深耕绿色转型：拓展沿线绿化范围，完善荒漠绿带生态体系；攻坚天然气放空回收技改，推动资源零直排；布局光伏、余热发电，风光气储氢融合项目，落地一批轻量化绿色示范工程。黄沙不语，绿木为证，穿梭戈壁的输气管道，以生态修复、技术创新搭建起中乌友好桥梁，为共建“一带一路”持续注入绿色动能。

（中乌天然气管道公司报送）

高原筑通途，守护绿色家园

在吉尔吉斯斯坦伊塞克湖州蒂普地区海拔超过1800米的高原上，一条全长50公里的跨境公路蜿蜒穿过山地、草原与河谷，连接吉国东部与哈萨克斯坦阿拉木图边境。这里冬季漫长严寒，生态敏感脆弱，沿线分布着圣塔什塔默兰等历史文化遗迹。

在中国路桥工程有限责任公司完成这一中亚区域连接线三期道路修复项目之前，从伊塞克湖州往返哈萨克斯坦阿拉木图需绕行460公里迂回山路，单程耗时高达8小时，新线路将直达里程压缩至280公里，单程通行时间缩短超六成，彻底告别冬季老路积雪、雪崩、结冰限行的通行困境。

项目实施过程中，施工方始终秉持环境、社会和治理（ESG）理念。在生态保护方面，项目严格执行“少破坏、多保护、少扰动、多防护”原则，施工前全面摸排植被、水源、古墓分布，优化便道与临建布局，减少草原与耕地占用。弃土场设置环形截水沟与挡护结构，严防水土流失；路基边坡采用本土耐旱植物修复；施工期间，常态化洒水降尘，拌合站配备除尘设备，油料及化学品专区防渗存放，严守Tyup河、Karkyra河高山融水水源安全。项目还邀请吉尔吉斯斯坦考古专家对沿线古墓采取保护性措施，优化施工方案避让文物区，实现工程建设与文化保护的兼顾。



中亚区域连接线三期道路修复项目沿线的高原湿地得到保护

在助力民生方面，施工方在项目合同外为沿线的萨雷-塔拉果依村、桑塔什村、卡尔喀拉村等3个村庄修复村内道路，解决了村民出行难、通行险的问题。2023年卡尔喀拉村遭遇洪水灾害，项目建设者们第一时间投入人员、机械参与抢险与灾后重建。冬季大雪封路期间，项目部常态化开展道路积雪清理作业，全力守护牧区通道畅通。2025年1月，桑塔什村一位老人不幸辞世，连日暴雪将村庄通往墓地的道路彻底封堵，当地殡葬出行陷入困境。村委会紧急向项目部求援，项目经理第一时间调度装载机、平地机等大型机械设备奔赴现场抢通除雪，打通了村庄至墓地的安全通行线路，解了村民的燃眉之急，拉近了企业与社区的情感距离。

据统计，项目建设期间为当地累计创造就业岗位超1500个，同时企业通过开展技能培训，提高了当地员工的技术水平。



在施工现场的中国路桥员工

从高原生态的精心守护，到沿线村庄的暖心相助，再到项目建设实现的互联互通红利，实践表明，企业在中亚的高质量可持续发展，关键在于将企业发展与当地生态、社会、治理需求深度融合，实现经济效益、社会效益、生态效益的多赢，为共建“一带一路”提供持久动力。

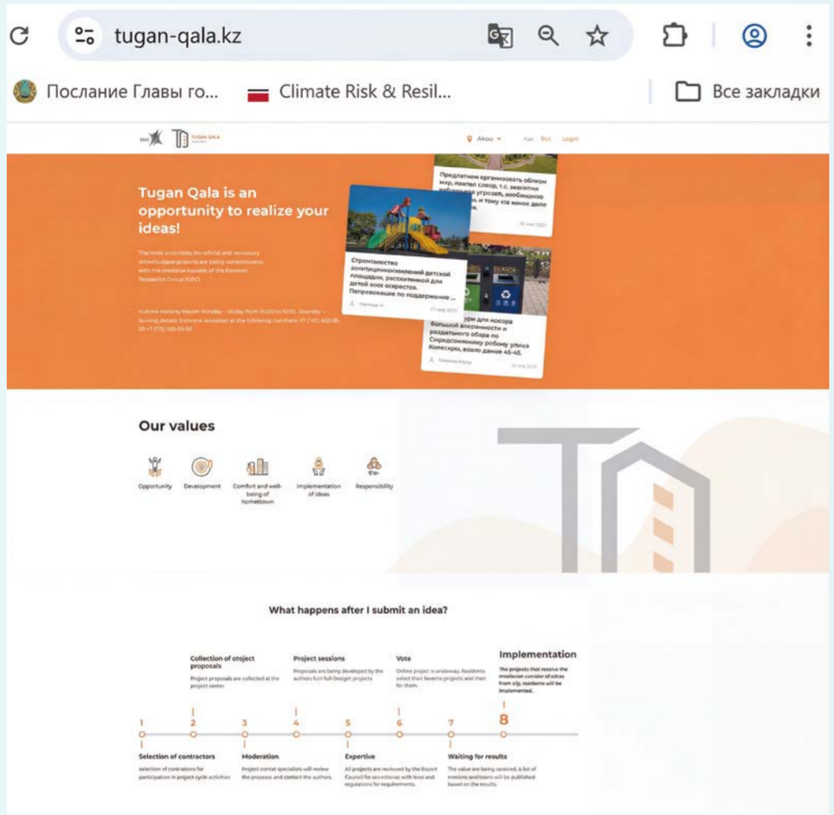
（中国路桥工程有限责任公司报送）

社区投票定项目 企业出资来建设

ERG Kazakhstan Decarbonization Strategy

ECO-DOCUMENT





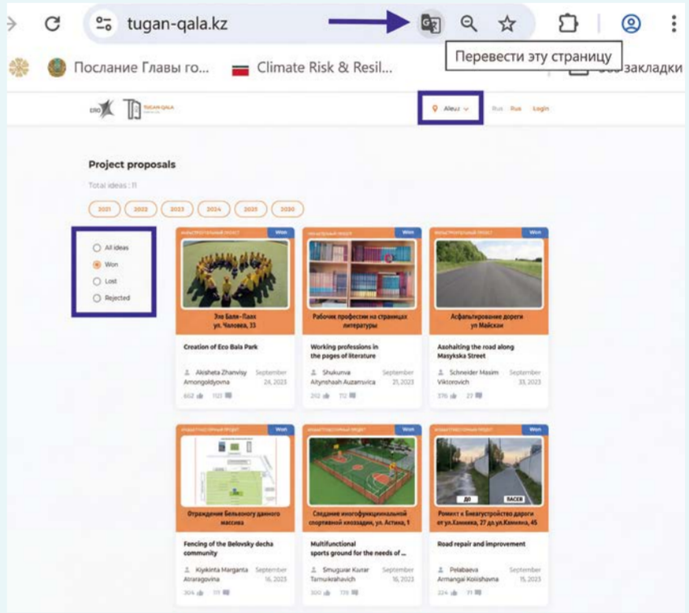
图甘卡拉参与式社会影响生态体系门户网和生态体系流程

在哈萨克斯坦的部分单一工业城镇，一项独特的社区实验正在改变城市面貌：居民通过手机在线提交公共空间改造方案，全民公开投票遴选项目，企业出资实施。从河岸无障碍通道到住宅楼外墙巨幅壁画，从社区广场艺术装置到儿童游乐设施——这些项目均由居民自己提出、自己选择、自己监督。这便是欧亚资源集团（ERG）创立的图甘卡拉（Tugan Qala）参与式社会影响生态体系。

ERG认为，企业社会责任可被视为一种参与式发展体系，核心原则为：公民决定而非企业代为咨询、项目反映真实需求而非机构预设、社区共同拥有成果以确保长期可持续。其旗舰平台图甘卡拉搭建了完整的在线参与机制，居民可自主提交项目方案，经社区公开投票遴选后由企业出资实施，全过程通过网站接受社会监督。

2020至2025年，图甘卡拉累计实施197个社区项目，投入资金17.3亿坚戈，单个项目最高资助1500万坚戈。城市4%至10%的居民直接参与项目投票——在参与式治理模型中属全球领先水平。项目提交数量和社区活跃领袖人数持续增长，居民参与意愿逐年攀升。

图甘卡拉催生了一批超越传统市政规划的创新成果：在哈萨克斯坦阿克苏市，居民将河岸改造为轮椅可全程通行的无障碍滨水空间，系该市首次；在赫罗姆套市，居民集体投票将矿工头盔确立为城市标志符号并嵌入公共空间设计，形成独特的社区身份认同；在多座城镇，空白住宅楼外墙经居民设计变为大幅壁画，重新定义了城市面貌。



图甘卡拉参与式社会影响生态体系项目提案展示

图甘卡拉作为单一项目平台，构建了完整的社会参与生态。体系延伸至多个领域：青年公民教育——“积极公民学校”培训63名学生，其主导的9个项目经公众投票胜出并落地；大学生创业孵化自2017年起覆盖多所高校，将创业教育嵌入教学体系；残障辅助技术创新马拉松举办16届，产出多项实用原型；妇女社区领导力平台ALQA在赫罗姆套市建立了同伴支持与家庭赋能网络。各计划相互衔接，形成了从个人赋能到社区整体转型的持续参与通道。

该模式的影响正从企业层面向更广领域延伸。目前，哈萨克斯坦已有公共机构开始借鉴图甘卡拉采用的参与式方法和治理工具。当地长期依赖单一产业的工业城镇，正展现出新的发展潜力。

（欧亚资源集团报送）

Ministry of Science
and Higher Education
Republic of Kazakhstan

丝路传智光
AI教育共启未来



AI-SANA

THE SPRINGBOARD OF TECHNOLOGY

INNOVATIVE AI PROGRAM

A PLATFORM FOR TECHNOLOGY DEVELOPMENT AND ARTIFICIAL INTELLIGENCE TRAINING

在哈萨克斯坦数十所大学的机房里，青年学子们可以通过在线学习平台一步步探索人工智能的世界——从基础概念入门到核心搜索算法推演，再到各行各业的场景化应用实践，一条完整的人工智能人才培养链条，正在这个中亚大国稳步铺展。这便是由哈萨克斯坦科学与高等教育部主导、面向全国高校推行的“AI-SANA”国家人才培养计划。

AI-SANA计划源自哈萨克斯坦总统托卡耶夫在数字桥梁论坛上作出的战略部署，核心目标是加快全民人工智能素养提升，为国家数字化转型筑牢坚实的人才根基。项目采用政府统筹、高校落地、产业协同的三方联动模式：哈科学与高等教育部出台统一指引，推动人工智能课程正式纳入高校学术体系；全国45所合作高校承接教学落地与学生组织；华为技术哈萨克斯坦有限公司作为项目战略合作伙伴，依托成熟的ICT教育资源与技术能力，为项目提供课程体系、在线学习平台及全流程技术保障。



华为AI课程提供英语和哈萨克语两种语言

为保障教育资源的包容性与可及性，华为技术哈萨克斯坦有限公司将《人工智能概述》《搜索与人工智能》《人工智能与应用V2.0》三门核心人工智能课程翻译成哈萨克语，让不精通外语的本地学生能无障碍地接触AI前沿内容。依托统一的在线学习平台，云计算、网络通信、人工智能等核心方向的250余门ICT课程向哈萨克斯坦全国大学生开放，搭建起覆盖从入门到进阶的完整数字技能学习体系。



华为ICT大赛学院学生

面对数十万级用户的大规模在线学习场景，华为技术哈萨克斯坦有限公司建立了全天候实时技术支持响应机制，第一时间解决并发访问带来的各类技术问题，保障平台长期稳定运行。与此同时，学习报告系统可实时输出学生学习进度、课程完成率与参与活跃度等数据，让教育工作者可以随时掌握教学动态、并及时根据需要调整教学策略。华为技术哈萨克斯坦有限公司还定期开展线上师资培训，帮助高校教师熟练掌握平台操作与教学管理方法，推动教学管理部门持续优化课程设置与实施路径。

项目实施以来，落地成效远超预期。截至目前，已有超过22万名学生活跃在这套学习生态中，其中20余万人顺利完成人工智能基本课程学习。这样的规模，既体现了项目强大的执行能力与覆盖能力，也真切反映出哈萨克斯坦青年群体对数字化技能的强烈渴望与学习动力。

AI-SANA项目展示了政府、学术界与产业界跨国协同创新的巨大潜力。它不是简单地将课程搬上互联网，而是构建了一套从政策引导、课程建设、内容本地化、师资培训到学习追踪的全链条人才培养体系，为哈萨克斯坦的数字化转型与智能未来注入了可持续的人才动力。

（华为技术哈萨克斯坦有限公司报送）

“美好”劳动计划 暖心铁路人





1.6万公里铁路线连接起世界上面积最大的内陆国——哈萨克斯坦的广袤国土。从东部山区的偏远小站到西部荒漠的机务段，曾经简陋的休息室、老旧的卫生设施正在被崭新的现代化空间取代；过去员工诉求难以直达管理层的困境，如今也被多渠道、透明化的反馈机制破解……

铁路行业以高强度体力劳动、偏远地区作业、高生产风险著称。上千个线性场站分散在哈萨克斯坦各个角落，如何保障统一标准的劳动条件与企业文化，曾是哈萨克斯坦国家铁路公司面临的系统性挑战。2022年，拥有11.6万名员工的哈萨克斯坦国家铁路公司启动了“美好”劳动条件提升计划。这一计划对应“安全、领导力、雄心、自豪、责任”五大核心价值，成为国家铁路2029年可持续发展战略的核心支柱，旨在让每一位铁路员工都能感受到尊重、保障与成长。

这一计划构建了五大相互支撑的实施体系：通过独立第三方平台定期开展员工满意度调研，形成参与度、社会福祉等核心指数；每半年覆盖至少25%员工的生产关系监测，评估包括劳动保护、职场幸福感在内的11项指标；每年投入数百亿坚戈，系统性升级全线路场站的生活卫生基础设施；搭建多渠道诉求处理系统，确保员工声音能够被及时听见；培育管理层与员工平等对话的企业文化，建立匿名安全的沟通渠道。

制度创新是这项计划实施中最突出的特色。比如在中亚铁路行业首创企业监察员制度，设立独立于管理层的员工权益保护人，在严格保密的前提下处理职场歧视、不公待遇等问题，为员工提供脱离层级制约的保护屏障。计划实施还配套出台符合国际劳工组织标准的反骚扰与反歧视政策，并于2024年发布基于联合国工商业与人权指导原则的企业人权政策，将劳动权益、性别平等要求覆盖到全体员工及合作承包商。

数字化手段让社会气候管理从“感性判断”变为“精准治理”。这项计划执行中将所有数据都整合到基于商业智能技术的统一分析平台，通过动态仪表盘实时追踪各地区、各部门的员工诉求分布、投诉趋势与调研结果，在交互式地图上精准标注“热点区域”，让管理层能够提前预判并解决问题。企业还率先完成与哈萨克斯坦国家财富基金旗下统一诉求处理信息系统的全面集成，建立标准化九步诉求处理流程，实现从登记到反馈的全闭环管理。

“测量只有转化为行动才有意义”，这是“美好”劳动条件提升计划的核心准则。成果正在显现：计划执行首轮调研发现的线性场站生活设施短板，迅速转化为全国性的升级工程；监察员制度的建立，让集体诉求数量大幅下降，员工对管理层的信任度显著提升。

“美好”劳动条件提升计划让穿越中亚大地的铁路大动脉跳动得更为有力，它不仅承载着货物与人员的流动，更承载着十多万哈萨克斯坦铁路人的幸福与希望，为中亚地区企业践行可持续发展提供了可复制的标杆。

（哈萨克斯坦国家铁路公司报送）

CHINA ECONOMIC INFORMATION SERVICE

CEIS中经社



ESG in Action across Central Asia: Outstanding Practice Cases

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Preface

Central Asia, a vital hub along the ancient Silk Road, is also where the Belt and Road Initiative was first proposed. On this land—rich in resources yet ecologically fragile—the development of energy and mining industries and the construction of infrastructure must transcend short-term economic returns and make a long-term commitment to protecting the natural environment and supporting local communities. We are heartened to see that a growing number of enterprises deeply rooted in Central Asia are advancing project development in tandem with ecological protection, and are actively engaged in local education, healthcare, and the improvement of people's livelihoods. China's clean technologies and digital management expertise are providing tremendous impetus to Central Asia's green transition—and all of this stands as the bountiful fruit of the deep integration between the Belt and Road Initiative's pursuit of "high standards, sustainability, and better lives" in cooperation and the United Nations' ESG development philosophy. Enterprises are not merely builders of projects, but implementers of green standards, bearers of social responsibility, and exemplars of rigorous governance.

At this new historical juncture, China Economic Information Service and the BRI International Green Development Coalition have jointly compiled this Outstanding ESG Practices of Enterprises in Central Asia: A Case Collection. Our purpose is not only to document the efforts and innovations through which enterprises advance green and low-carbon development across Central Asia, but also to outline a sustainable ecological blueprint for China–Central Asia enterprise cooperation in the new era.

This case collection brings together 13 representative outstanding ESG practices, spanning such dimensions as desertification control, renewable energy, smart manufacturing, ecologically conscious connectivity, clean production, education empowerment, labor protection, and institutional innovation in public participation.

The collection endeavors to present three main threads. The first is technology-driven transformation—how key technologies such as photovoltaics, wind power, energy storage, and smart construction can convert traditional energy strongholds into clean-energy highlands. The second is institutional innovation—how community co-building, public participation, and expanded approaches to labor protection can embed the vision of shared development into the full project lifecycle. The third is the integration of responsibility—how social-responsibility elements such as ecological protection, carbon-emission management, biodiversity, talent cultivation, and livelihood improvement can be systematically incorporated into corporate decision-making and project operations, so as to truly achieve a balance among economic, social, and environmental benefits.

This case collection aims, in an objective, rigorous, and comparable manner, to offer international peers practical samples of enterprise ESG practices from Central Asia; to provide a reference for governments, industry associations, research institutions, enterprises, and investors seeking to understand the real progress of Central Asia's green transition; and to contribute wisdom and solutions toward deepening green and low-carbon cooperation between China and Central Asia and the wider region.

We hope this case collection will serve as a bridge connecting policymakers, industry practitioners, and academic researchers, so that together we may build a prosperous, green, and inclusive new ecology along the Silk Road, allowing the ancient spirit of cooperation shine more brightly in the new era.

China Economic Information Service
BRI International Green Development Coalition
July 2026

White Giants Stand Between Heaven and Earth, Zhanatas Bathed in Light

On the Gobi Desert of Zhanatas in southern Kazakhstan, giant white wind turbines rotate slowly in the sweeping steppe winds. The soft whir of blades cutting through the clear sky mingles with the laughter of children at a nearby swimming pool, composing a heartwarming summer symphony. Power supply was once severely strained here, with summer nights often plunged into darkness. Today, a steady stream of green electricity flows from the Gobi beneath the wind turbines to all directions, lighting up 200,000 households and breathing new vitality into this land.

Since the 100MW Zhanatas wind power project was connected to the grid at full capacity in 2021, followed by the successive completion of Phase I, II and III of the 221MW wind farm cluster in Akmola Region — each breaking the record for the largest wind power cluster in Central Asia — rows of wind turbines have risen across the steppes and Gobi deserts of Kazakhstan.

These are the fruitful outcomes of China-Kazakhstan green energy cooperation. By the end of 2025, the total installed capacity of these China-Kazakhstan green projects invested by the State Power Investment Corporation (SPIC) in operation had reached 611MW, accounting for approximately 16.77% of Kazakhstan's total installed renewable energy capacity. Generating nearly 2.1 billion kWh of electricity annually and reducing carbon dioxide emissions by nearly 2 million tons per year, these projects have not only effectively alleviated the pressure of cross-regional power transmission in the southern region, but also become a core pillar of the local low-carbon energy transition. The projects have not only advanced the development of three core standards for Kazakhstan's energy storage industry, but also directly facilitated the launch of the country's first energy storage project and the introduction of colored photovoltaic technology.



The swimming pool donated by SPIC for the town of Zhanatas

Green wind power delivers tangible benefits to local livelihoods. While advancing wind power construction, the project team has invested a total of nearly 180 million tenge (3 million RMB) over six consecutive years to build swimming pools, cultural squares and tree-lined avenues for surrounding communities, and renovate housing for women with disabilities and families with multiple children. When floods struck, the team was the first to extend a helping hand to nearby residents. During the construction period, the projects created more than 2,000 jobs in total.

After commissioning, nearly 90% of the over 100 permanent positions are held by local employees. Residents of remote towns like Zhanatas have secured stable employment close to home, bringing a new outlook to the local industrial economy. The project operator has also established a joint talent training mechanism with Kazakh universities. Through a mentorship pairing model, it has cultivated professionals awarded the title of "Outstanding Power Engineer" by the Ministry of Energy of Kazakhstan.



China-Kazakhstan cultural exchange event co-organized by SPIC Kazakhstan Energy Investment Company

From the joint environmental impact assessment at the initial construction stage to avoid ecologically sensitive areas, to the classified disposal of solid waste during operation achieving zero pollutant discharge, and to the ongoing annual bird observation and environmental monitoring, the projects always prioritize ecological protection, with all monitoring data meeting compliance requirements.

These green practices rooted in Central Asia serve as a vivid footnote to the win-win cooperation between China and Central Asian countries under the Belt and Road Initiative. Winds stretch across thousands of miles, and green vitality extends far and wide. The spinning wind turbines not only deliver clean electricity, but also carry the generations-long friendship between China and Kazakhstan, adding a touching hue of green to the ancient Silk Road.

(Submitted by SPIC Kazakhstan Energy Investment Company)

New Energy + Energy Storage: Spinning the Wheel of Green Development for Central Asia

Stretching endlessly across the Karatau Mountains, roughly 70 kilometres southeast of Nukus in northwestern Uzbekistan, lies an expanse of desert and Gobi. Torrid summers and frigid winters define the region, compounded by underdeveloped power infrastructure that has long plagued local residents with unstable electricity supply. Today, 26 white wind turbines standing 140 metres tall tower over the mountain ridges like giants, their rotors spinning in the wind to convert the Gobi's wind power into a steady stream of green electricity.

This is the Nukus 200 MW Wind Power and 100 MWh Energy Storage Project, one of Central Asia's landmark new energy developments. The project is equipped with 26 wind turbines each boasting an 8.0 MW single-unit capacity and a hub height of 140 metres, alongside supporting booster substations, energy storage stations and power transmission lines. As a zero-emission clean energy source, wind power will largely displace fossil fuels once the project reaches full operation. It will cut coal-fired power generation substantially each year, slashing emissions of carbon dioxide, sulphur dioxide and nitrogen oxides. Meanwhile, the supporting energy storage system markedly boosts the integration capacity of renewable energy and further elevates wind energy utilization efficiency.

Ecological protection has been a top priority throughout the project's construction. Ecological surveys were conducted in the early phase to identify key protected species and their migration routes, with targeted conservation measures formulated accordingly. Protected fauna were guided to migrate prior to construction; buffer zones were established in core ecological zones, and construction schedules were adjusted to avoid disrupting animal breeding cycles. For the desert tortoise, a locally protected species, the developer retained dedicated ecologists to conduct regular monitoring. Upon sighting any tortoises, an incidental discovery response protocol is activated immediately for professional observation and assessment, minimizing disruption to their habitats to the greatest extent possible. Moreover, systematic vegetation restoration and land reclamation work commences promptly once construction wraps up in individual zones.



Project ecologists carry out protective handling and continuous tracking monitoring of wild desert tortoises

Stringent resource conservation standards were upheld during construction. Turbines were laid out along mountain ridges and wind corridors to limit damage to the original landform; access roads were designed following a minimal-disturbance principle to harmonize construction with the natural environment. Dust suppression was implemented via water sprinkling and surface covering during construction, transport vehicles were fully enclosed, and construction machinery underwent regular exhaust emission inspections. Waste was sorted categorically, while recyclable materials including steel and concrete were reused. Thanks to rigorous environmental and resource management systems, land disturbance and dust pollution have been kept well under control, and the surrounding ecosystem has been properly safeguarded.

The construction and operation of the Nukus Wind and Energy Storage Project have not only brought new industries and local jobs but also spurred growth in neighbouring transport and service sectors. The project team proactively visited local communities for face-to-face talks with community administrations, engaging in in-depth discussions on regional coordination and local employment promotion to foster sound interactions and harmonious ties between the enterprise and local residents. The project's proposer also places great emphasis on nurturing local talent. Through on-the-job training and vocational courses, local employees have upgraded their technical expertise, enabling effective technology transfer and cultivating a pool of skilled professionals for Uzbekistan's new energy industry.



The project team pays proactive visits to local communities for in-depth exchanges on coordinated regional development

Concurrent with construction, surrounding infrastructure including roads and power facilities has been upgraded. New access roads and internal plant roads were built, and existing ones renovated, boosting regional transport connectivity and power supply reliability. The project's environmental and social team partnered with local universities and government authorities to host seminars and lectures covering vocational education and career planning, delivering tangible support for local students' professional advancement.

For its outstanding performance in engineering quality, work safety and social responsibility, the Nukus Wind and Energy Storage Project was awarded the Excellent Project Prize by Uzbekistan's Ministry of Construction.

Transformed from barren desert into a green energy hub, the Nukus Wind and Energy Storage Project adopts the innovative New Energy + Energy Storage model to deliver balanced progress across clean energy exploitation, ecological conservation and improved community livelihoods. Joint efforts by Chinese and Uzbek enterprises turn not only steel rotor blades, but also the wheel of hope for green development across Central Asia.

(Submitted by PowerChina Huadong Engineering Corporation Limited)

Technology Knows No Borders, Green Bonds Connect Us All



On the vast Gobi Desert of Navoi Region, Uzbekistan, rows of deep-blue photovoltaic panels glisten under the bright blue sky. Robotic arms of fully automatic intelligent installation robots move with pinpoint accuracy, mounting each module to a tolerance of mere millimeters. Once a desolate wilderness rarely visited by people, the area previously relied on long-distance power transmission for electricity supply. Today, technological advances in intelligent construction are writing a new chapter of green energy on this land, with clean electricity flowing nonstop from here to countless households.

This landmark project embodies the in-depth integration of green energy and intelligent construction between China and Uzbekistan. Developed and invested by CEECOIC, a subsidiary of CEEC, the Navoi Photovoltaic Project comprises a 300 MW photovoltaic power station and a 150 MW/300 MWh energy storage system. As the first new energy project in Central Asia to deploy fully automatic intelligent robots for photovoltaic module installation, it delivers remarkable environmental benefits upon completion. The project can generate approximately 750 million kilowatt-hours of clean electricity annually and reduce carbon dioxide emissions by around 1.61 million tons per year, injecting stable and sustainable green momentum into Uzbekistan's energy transition and power security.

AI-powered construction stands out as another highlight of the project. Intelligent construction technologies have been adopted for core construction procedures. Leveraging high-precision robotic arms, visual recognition systems and multi-sensor fusion technology, the fully automatic photovoltaic module installation robots deliver round-the-clock, high-efficiency and highly consistent standardized operations. Compared with conventional manual installation, a single robot can mount 700 to 800 photovoltaic modules per day — over twice the output of a six-person work crew. It achieves millimeter-level installation precision with a one-time success rate exceeding 99%. The adoption of intelligent construction technologies has cut the critical path construction period by more than 30%, marking a qualitative leap in overall installation efficiency and project quality.

The project developer upholds the philosophy of "teaching people how to fish rather than giving them fish". It combines technology transfer with local training. Through a mentorship pairing program and systematic technical training, a cohort of local engineers proficient in intelligent operation, maintenance and technical management has been cultivated. Mahmudov Murodjon, a young Uzbek engineer, can skillfully operate and monitor robot performance after receiving comprehensive training from Chinese engineers. Local technical talents like him are growing rapidly amid project construction. Advanced intelligent construction technologies have not only boosted efficiency but also taken firm root locally, building up a talent pool to fuel the growth of Uzbekistan's new energy industry.



On-site Robot Operators of the Navoi Photovoltaic Project

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Check-in Area at the Navoi Photovoltaic Project Public Open Day

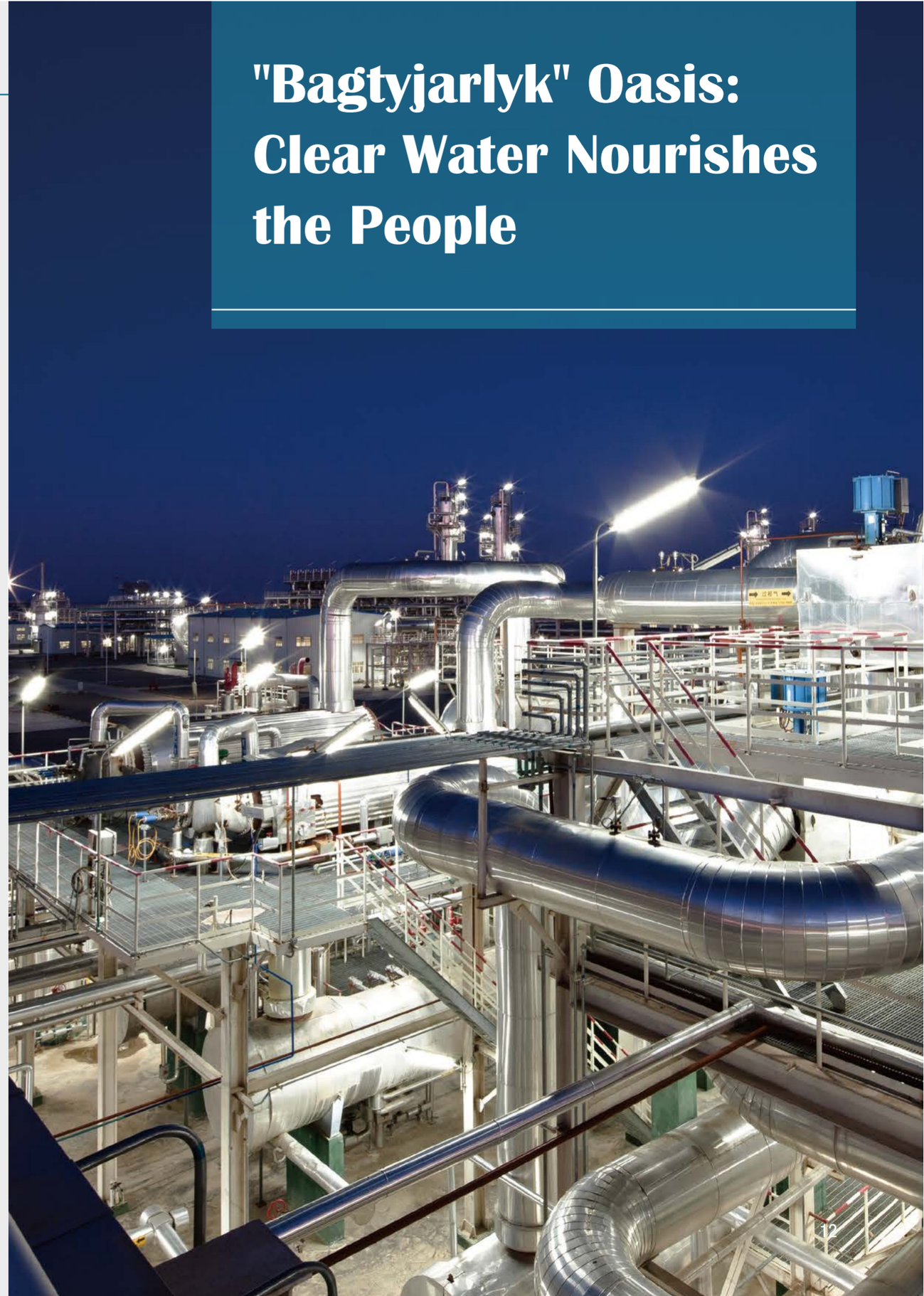
Openness and sharing forge consensus. The Navoi Photovoltaic Project hosted a Public Open Day themed "Visible Green Energy, Tangible Intelligent Construction". Nearly 100 representatives from Uzbek government agencies, industrial associations, universities, media outlets and local communities visited the project site to gain first-hand experience and deepen mutual understanding and consensus. Following the official unveiling of the Intelligent Construction Demonstration Base for photovoltaic projects, the platform opens its doors to government bodies, industry players and universities, showcasing achievements in intelligent PV installation, digital construction management and smart equipment application. It offers a replicable and scalable practical model for exploring intelligent construction pathways for new energy projects across Central Asia.

From precision construction on the Gobi wasteland, to demonstration and popularization of intelligent construction technologies, and systematic training of local talent, the Navoi Photovoltaic Project seamlessly integrates technological innovation with green development. This green practice of embedding intelligent construction in Central Asia serves as a vivid microcosm of China and Uzbekistan joining hands under the Belt and Road Initiative to advance green and low-carbon development and foster new productive forces.

Technology knows no borders, green bonds connect us all. The radiance of intelligent construction technology and the driving force of green energy development reinforce each other, lighting up a future of sustainable development along the ancient Silk Road. It supplies an endless stream of innovative momentum for jointly building the Green Silk Road and deepening the comprehensive strategic partnership between China and Uzbekistan.

(Submitted by China Energy Engineering Overseas Investment Co., Ltd)

"Bagtyjarlyk" Oasis: Clear Water Nourishes the People



In the heart of the Karakum Desert of Turkmenistan, where once swirling sandstorms raged and not a single blade of grass could grow. there now stands a tree-shaded camp, where gurgling clear streams nourish the green barriers woven from straw checkerboard barriers. In this place known as the "Bagtyjarlyk" Contract Territory ("Bagtyjarlyk" means "Land of Happiness" in Turkmen), the villagers who once suffered from water shortages can now turn on their taps for clean running water, making it a true "Land of Happiness" in the hearts of the people.

In 2007, the Amu Darya Right Bank Natural Gas Project was launched under the witness of the heads of state of China and Turkmenistan. Covering 14,300 km² and achieving stable, high-volume production exceeding 10 million tonnes of oil equivalent for 11 consecutive years, this project has always prioritized ecological protection. In response to the increasing volume of produced water of mid-to-late stage gas field development, the company established a closed-loop wastewater treatment system, including nine zonal treatment stations with a daily processing capacity of 3,600 cubic meters. Through multi-stage treatment including oil-water separation, chemical flotation, and precision filtration, the oil content, suspended solids, and hydrogen sulfide levels in the effluent are all controlled below 10 mg/L. Camp domestic sewage has been upgraded from "discharge to standard" to "resource recovery and reuse," with over a thousand tons of fresh water saved each year. This practice has been recognized as an exemplary environmental case in Turkmenistan and promoted accordingly.

In the fragile desert ecosystem, the project strictly enforces a "single road" access policy and follows the principle of "greening every operational site." By planting drought-resistant vegetation suited to local conditions and building large-scale straw checkerboard barriers for sand stabilization, the desert has gradually been transformed into an ecologically livable area, with the camp being affectionately called "Green Chinese Town" by local residents. In terms of greenhouse gas control, by implementing measures including methane leak detection, precise adjustment of flare gas volumes, rigorous equipment integrity inspections, and installation of waste heat steam recovery units, the project has consistently met regulatory standards during multiple on-site inspections by the United Nations Environment Programme.

The focus on talent development has provided important support for the sustainable development of the project. Each year, the project selects and fully funds approximately 15 outstanding Turkmen students to pursue advanced studies at China University of Petroleum. To date, it has trained over a hundred graduates, who have now grown into industry backbone in their home country. The project has also delivered a cumulative total of nearly 7,000 local training sessions, with over a hundred local employees growing into key management roles. In addition, the project has jointly established a Luban Workshop with Yagshigeldi Kakayev International University of Oil and Gas, organizing annual faculty and student exchanges.



Wastewater treatment equipment

The project sponsor not only invested USD 3.59 million to build a water plant in Mekan Village, Lebap Province, providing safe drinking water for more than 5,000 villagers — an achievement hailed by Turkmenistan's national media as a model of livelihood cooperation under the Belt and Road Initiative — but also allocates approximately USD 1.2 million each year to local public welfare and compulsory training, gradually establishing a workforce structure with orderly succession of local personnel.



Representatives from various sectors in Turkmenistan attending the commencement ceremony of the Mekan Village Water Plant (drinking treated tap water on site)

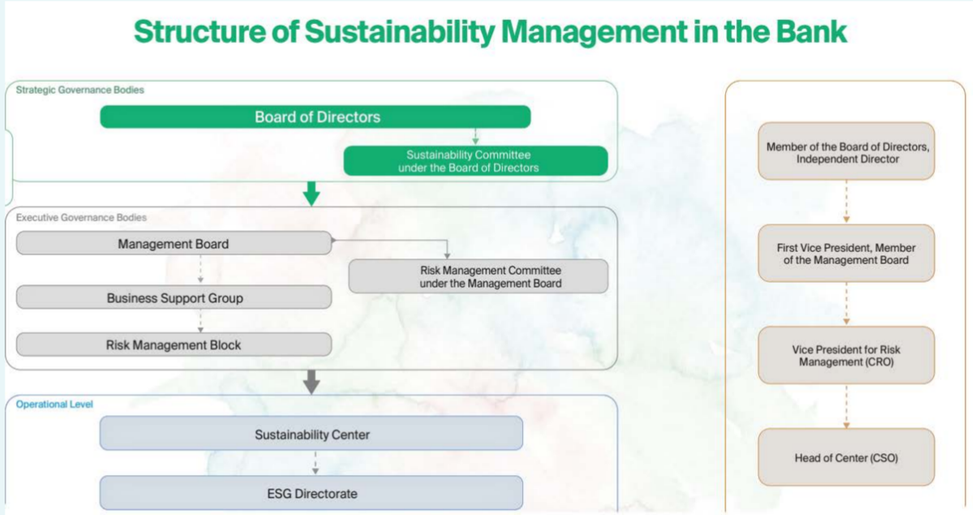
The practice of this project, rooted in the vast desert, demonstrates that energy development, ecological protection, and community development can be advanced in synergy. Boundless as the desert may be, the gas artery connects all. What flows out of the Karakum Desert is not only natural gas, but also a practical exploration of green development, local win-win cooperation, and joint talent cultivation for overseas energy projects.

(Submitted by: Petrochina International Co.,Ltd.)

Green Finance Links the Silk Road, Responsible Development Nurtures Central Asia

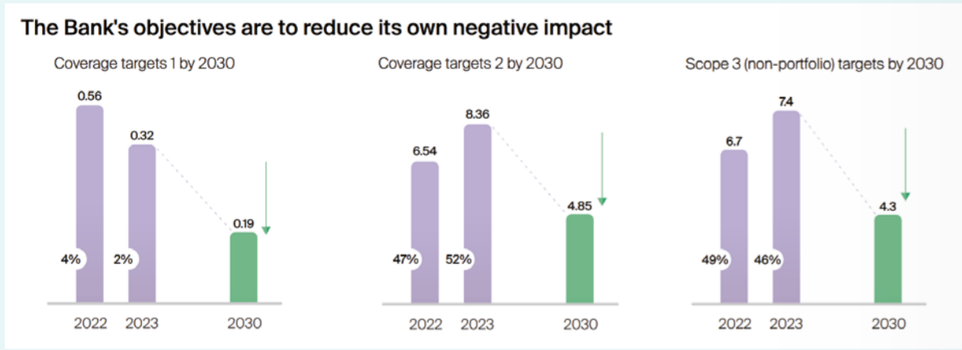
centercredit

Across the vast Central Asian expanse of Kazakhstan, a profound, far-reaching transformation is quietly unfolding within its financial sector. Instead of erecting skyscrapers or laying oil pipelines, this revolution redefines banks' relationship with the economy and society through a brand-new "green framework". This is the systematic ESG transformation launched in 2023 by JSC Bank CenterCredit. Over just two years, the bank has achieved a landmark green transformation in Central Asia's banking sector, evolving from scattered charitable initiatives to a formalized sustainable development governance system, and shifting from conventional credit underwriting to full-spectrum green finance that accounts for climate and environmental risks throughout every process.



Sustainable management structure of JSC Bank CenterCredit

The first step of the transformation was establishing institutional frameworks. In 2023, JSC Bank CenterCredit conducted a bank-wide ESG maturity assessment, followed by setting up a Sustainable Development Committee under its Board of Directors, chaired by an expert holding the internationally recognized Sustainability and Climate Risk (SCR) Certificate. ESG key performance indicators were incorporated into the assessment system for middle and senior management personnel. Meanwhile, a suite of policies covering sustainable development, anti-corruption and human rights was rolled out sequentially. ESG, thus, evolved from a supplementary, rhetorical initiative into a mandatory component embedded within the bank's corporate governance architecture. At the strategic level, JSC Bank CenterCredit took the lead among Central Asian banks in approving a 2050 climate strategy in 2024, pledging to cut greenhouse gas emissions across Scope 1, 2 and 3 under the internationally recognized Greenhouse Gas Protocol by 42% against the 2023 baseline by 2030.



Dynamics of uniform growth of the BCC green portfolio to achieve the goals by 2030. (Unit: billion tenge)

	2025	2026	2027	2028	2029	**2030**
The volume of the green loan portfolio	120	163	212	268	331	**400**

Emission Reduction Targets of JSC Bank CenterCredit

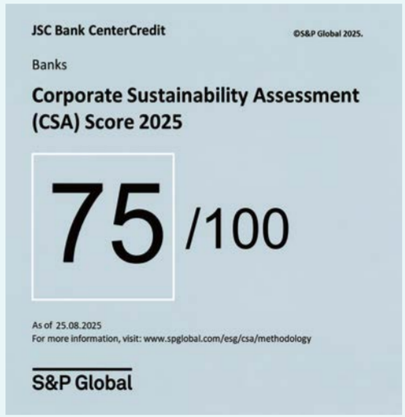
Green finance stands as the most tangible achievement of this transformation. By the end of 2025, the bank's green loan portfolio reached 151.9 billion Kazakhstani tenge (about 2.2 billion yuan). In September of the same year, it successfully registered its inaugural 100-billion-tenge green bond, which was listed on the Kazakhstan Stock Exchange. Under the green economy financing facility framework in partnership with the European Bank for Reconstruction and Development, the bank has supported projects delivering an annual carbon dioxide emission reduction of over 1.7 million tonnes. JSC Bank CenterCredit is also Kazakhstan's first second-tier bank to purchase International Renewable Energy Certificates (I-RECs), purchasing 1,000 MWh in 2024, and further raising the amount to 2,200 MWh in 2025 to offset the carbon footprint of its own operational power consumption. Furthermore, with support from consultancy CBI, the bank formulated its green finance policy in 2025. It passed an independent evaluation by the Green Finance Center of the Astana International Financial Centre, attaining the highest compliance rating under the International Capital Market Association's Green Bond Principles.

JSC Bank CenterCredit also delivers solid, tangible social responsibility outcomes. The bank has over 8,000 employees, 65.2% of whom are women, with women accounting for 54% of its management team. It has implemented a target-based performance management system and embraced the work-life balance philosophy. It has partnered with Sezim, Kazakhstan's online psychological platform, to provide professional counselling services for employees, and opened free fitness centres across its premises to promote a wellness-focused corporate culture. For the wider community, JSC Bank CenterCredit has consecutively

supported TURAQTY JOL, a national ecological education campaign since 2023, reaching more than 20,000 participants. The campaign has recycled 4 tonnes of waste and planted roughly 100 saplings. During catastrophic floods that hit western Kazakhstan in 2024, the bank allocated 5.5 billion tenge to fund housing reconstruction for affected families. It also participates in Karyzsyz kogam, a national financial literacy programme, offering legal aid and debt restructuring services to over-indebted populations. Its cumulative social investment over three years has exceeded 10.1 billion tenge.

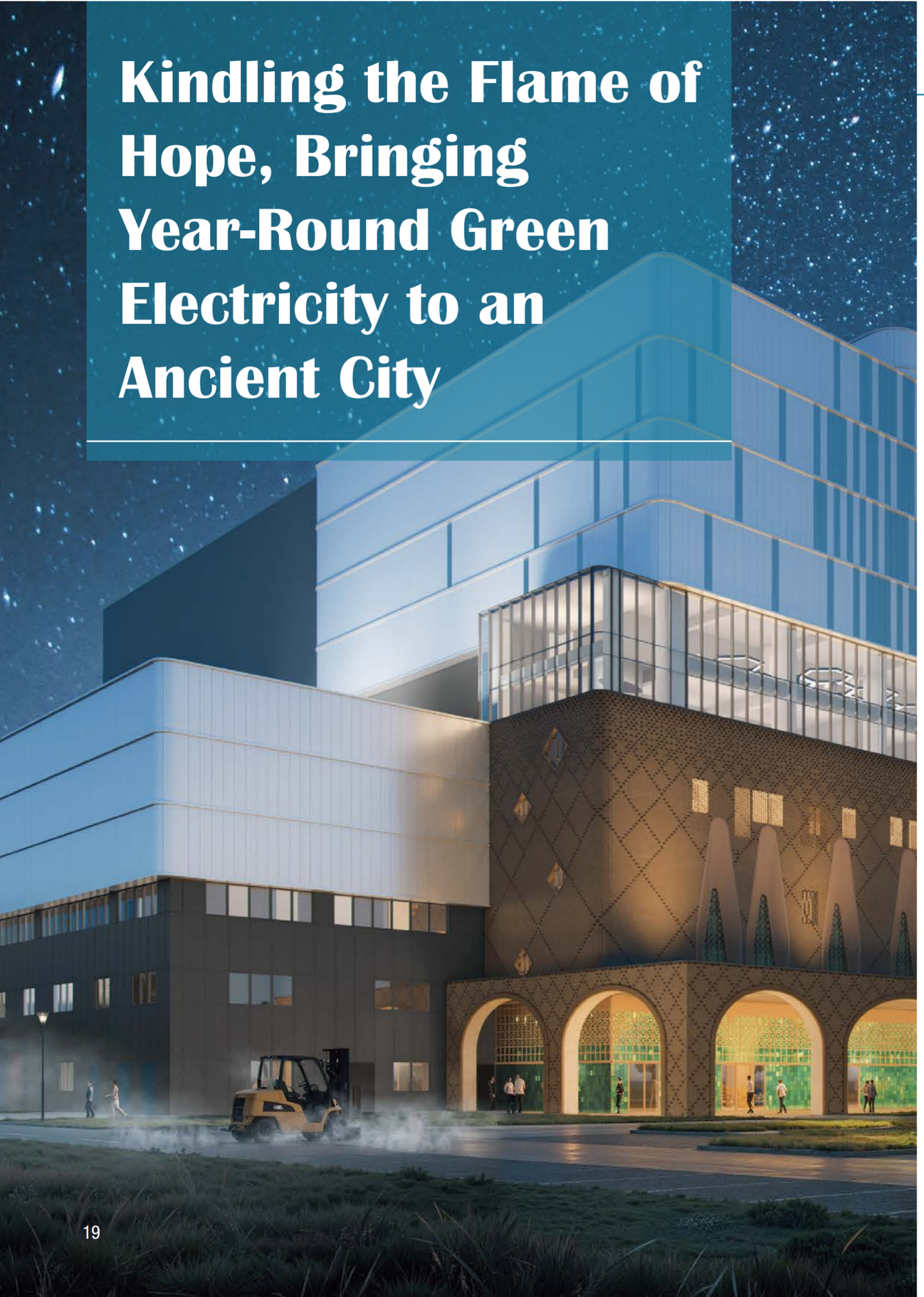
Transparent information disclosure underpins the credibility of ESG performance. JSC Bank CenterCredit has published sustainable development reports for two consecutive years, complying rigorously with GRI, SASB and TCFD standards as well as the guidance from Kazakhstan's financial regulator, with all core metrics independently assured by KPMG. Its second report went further by incorporating disclosure requirements under IFRS S1 and S2 and expanding the disclosure scope across the entire group. The bank has been awarded the Best Sustainable Development Report in the Financial Sector granted by the Kazakhstan Stock Exchange and the Best ESG Disclosure Award for Financial Institutions by PwC, ranking among the top ten in PwC's Kazakhstan ESG Ratings. On the international stage, its S&P Global Corporate Sustainability Assessment (CSA) score jumped from 61 in 2023 to 75 in 2025. In 2023, JSC Bank CenterCredit formally joined the United Nations Global Compact, marking full alignment of its ESG governance with global international standards.

From a Board of Directors' resolution to a green loan portfolio of over 150 billion tenge, from employee mental health support hotlines to the solemn commitments of the UN Global Compact, JSC Bank CenterCredit's ESG transformation practice proves that the financial sector can act as a core engine driving sustainable development across emerging economies. When green finance criteria are embedded into credit underwriting systems and climate risk considerations are woven into every lending decision, a more resilient Central Asian green finance ecosystem is taking shape at an accelerated pace. This green finance Silk Road serves not only as a thoroughfare for capital flows, but also as a vital bond linking responsibility and the future.



S&P Global CSA Score of JSC Bank CenterCredit (2025)

(Submitted by JSC Bank CenterCredit of Kazakhstan)



Kindling the Flame of Hope, Bringing Year-Round Green Electricity to an Ancient City

On the outskirts of Samarkand, Uzbekistan, construction of the waste-to-energy project is in full swing. Few would imagine that a "garden-style factory" will rise here in the future, treating domestic waste generated by the 4 million residents across the region and converting it into clean energy, helping to transform the environmental governance landscape of this millennium-old city.

Officially launched in April 2025, the project offers a key to solving the city's long-standing waste dilemma. Once completed and put into operation, it will have a domestic waste treatment capacity of 1,500 tons per day, disposing of more than 500,000 tons of waste annually and generating 383 million kilowatt-hours of clean electricity. Samarkand's waste management will make a leap from "simple landfilling" to energy recovery and resource recycling.

The project brings not just a factory, but a complete set of green governance solutions tailored for Central Asia. Its core incineration equipment is adapted to Central Asia's climatic characteristics and waste composition; a precise automatic control system stabilizes furnace operating conditions, inhibiting the generation of harmful gases while ensuring efficient combustion, with flue gas emissions meeting international standards. All production wastewater is treated and recycled in a closed loop, and the plant's overall power generation efficiency exceeds 30%. Every indicator upholds the ecological bottom line. Pungent odors from simple landfills will gradually fade, and contaminated soil and water will slowly regain their vitality.

What is more impressive than the technology is the project developer's sincerity in integrating into the local community. As early as the project planning phase, the construction team made community engagement a top priority: in partnership with local authorities, it organized residents and media representatives to travel thousands of miles to visit benchmark projects in China, turning the concept of "garden-style factories with near-zero emissions" from hearsay into first-hand witnessed reality. Doubts dissolved through openness, and resistance turned into support. Potential NIMBY concerns ultimately evolved into the public's shared aspiration for a better life. Longer-term green seeds have been sown on campuses: the project developer has partnered with local higher education institutions including Karshi State University to carry out targeted training, technical exchanges and internship programs, enabling young students to learn solid waste treatment technologies right at their doorstep and nurturing talents for Uzbekistan's environmental protection industry.

From design and site selection to construction, the entire project process is deeply aligned with regional needs, allowing China's low-cost, high-efficiency green governance technologies and experience to take root and bear fruit in Central Asia. The Chinese project leader has been appointed as an advisor to Uzbekistan's Minister of Environmental Protection, helping the country establish industry standards suited to its national conditions.



Campus Open Day held at the Samarkand Project Site

A letter of thanks from the President of Uzbekistan stands as a profound recognition of the project. This waste-to-energy plant is both a practical outcome of China-Uzbekistan environmental cooperation and a vivid example of the joint development of the Green Silk Road.

O'ZBEKISTON RESPUBLIKASI
PREZIDENTI

"SUS Environment" компанияси раиси
Цзишэн Луи Жанобларига

Ҳурматли Луи Жаноблари!

Ўзбекистон Республикасининг миллий байрами – Мустақиллик куни муносабати билан йўллаган самимий табрик ва билдирган эзгу тилакларингиз учун Сизга ўзимнинг чуқур миннатдорлигимни изҳор этаман.

Сиз бошқараётган компания бундан кейин ҳам юртимиз иқтисодиёти ривожига муносиб ҳисса қўшишига ва "яшил" энергетика соҳасида янги лойиҳаларни самарали амалга оширишга ишончим комил.

Фурсатдан фойдаланиб, Сизга мустаҳкам соғлиқ, оилавий бахт-саодат, фаровонлик, шарафли ишларингизда улкан муваффақиятлар тилаб қоламан.

Ҳурмат билан,

Шавкат Мирзиёев

Тошкент шаҳри,
2025 йил 1 сентябрь

Handwritten Thank-You Letter from the President of Uzbekistan

(Submitted by SUS ENVIRONMENT)

"We Are Not Passers-by, but Members of the Kazakh Family"

Rows of modern industrial facilities stand on the outskirts of Pavlodar, Kazakhstan. Contrary to the traditional perception of mining as a high-emission, high-pollution industry, these operations are clean, orderly and environmentally responsible. Environmental technologies—including waste heat recovery for power generation, water recycling and ecological restoration—are integrated throughout the entire production cycle.

China Nonferrous Metal Industry's Foreign Engineering & Construction Co., Ltd. (NFC) and NFC Kazakhstan Ltd. (collectively referred to as "NFC") have been deeply rooted in Kazakhstan for nearly two decades. While helping transform the country's non-ferrous metals industry, NFC has remained committed to advancing the green transformation of Central Asia's traditional mining sector.



Bozshakol Copper Concentrator in Kazakhstan

Constructed by NFC in 2005, the Pavlodar Electrolytic Aluminum Plant filled a critical gap in Kazakhstan's aluminum industry following the country's independence. It ended Kazakhstan's complete reliance on imported aluminum ingots and introduced world-leading aluminum smelting technology to the country. NFC subsequently delivered two world-class copper concentrators—Bozshakol and Aktogay. Built in strict accordance with European and international engineering standards, the projects incorporate state-of-the-art large-scale equipment and advanced automation systems, significantly enhancing Kazakhstan's position among the world's leading copper concentrate producers. Widely recognized as landmark industrial projects in Kazakhstan, they have received numerous prestigious awards, including China's National Quality Engineering Silver Award, the Kazakhstan National Engineering Award, the European Business Assembly (EBA) European Quality Award, and the Golden Eagle Quality Award.

While contributing to the modernization of Kazakhstan's non-ferrous metals industry, NFC has also helped project owners embed sustainability into traditional mining operations, promoting greener and more efficient mining development. The Bozshakol and Aktogay copper concentrators incorporate numerous sustainable design and operational features. Alongside extensive automation and advanced processing technologies, these projects have achieved both high productivity and improved energy efficiency.

First, the plant design fully reflects Kazakhstan's relatively scarce water resources. A tailings water reclaim system and a closed-loop process water circulation system have been established, enabling water recovered from the tailings storage facility to be reused in production. This significantly reduces freshwater consumption while minimizing the environmental impact of tailings discharge.

Second, the projects publicly disclose environmental performance data in accordance with international standards, integrate environmental protection into daily operations and management, and implement comprehensive environmental management throughout the entire production process, ensuring that industrial development and ecological conservation progress hand in hand.

Furthermore, long-term plans have been developed for mine closure, land reclamation, vegetation restoration and ecological rehabilitation, with dedicated financial resources allocated to support post-mining environmental recovery. In recent years, the specific energy consumption for sulfide ore processing has remained at approximately 0.19 TJ per thousand tonnes of ore—an internationally advanced level that reflects the principles of green, efficient and sustainable mining.

A strong commitment to localization has earned NFC long-term trust in Kazakhstan. Over the years, the company has created more than 10,000 local jobs, donated funds and supplies to children in welfare institutions, families with disabilities and disadvantaged elderly people, and supported the renovation of community infrastructure. The Aktogay Project was selected as an outstanding case in the Social Responsibility Projects for Chinese Construction Enterprises initiated by the United Nations Industrial Development Organization (UNIDO).

As the company's management often says, "We are not just visitors—we are members of the Kazakh family. We believe it is our responsibility to support vulnerable groups, invest in education and care for future generations."

From delivering Kazakhstan's first aluminum smelter to building world-class copper concentrators, from pioneering waste heat recovery to helping renovate community drainage systems, NFC's engineers have demonstrated responsibility, professionalism and friendship through innovation, dedication and sincere commitment.

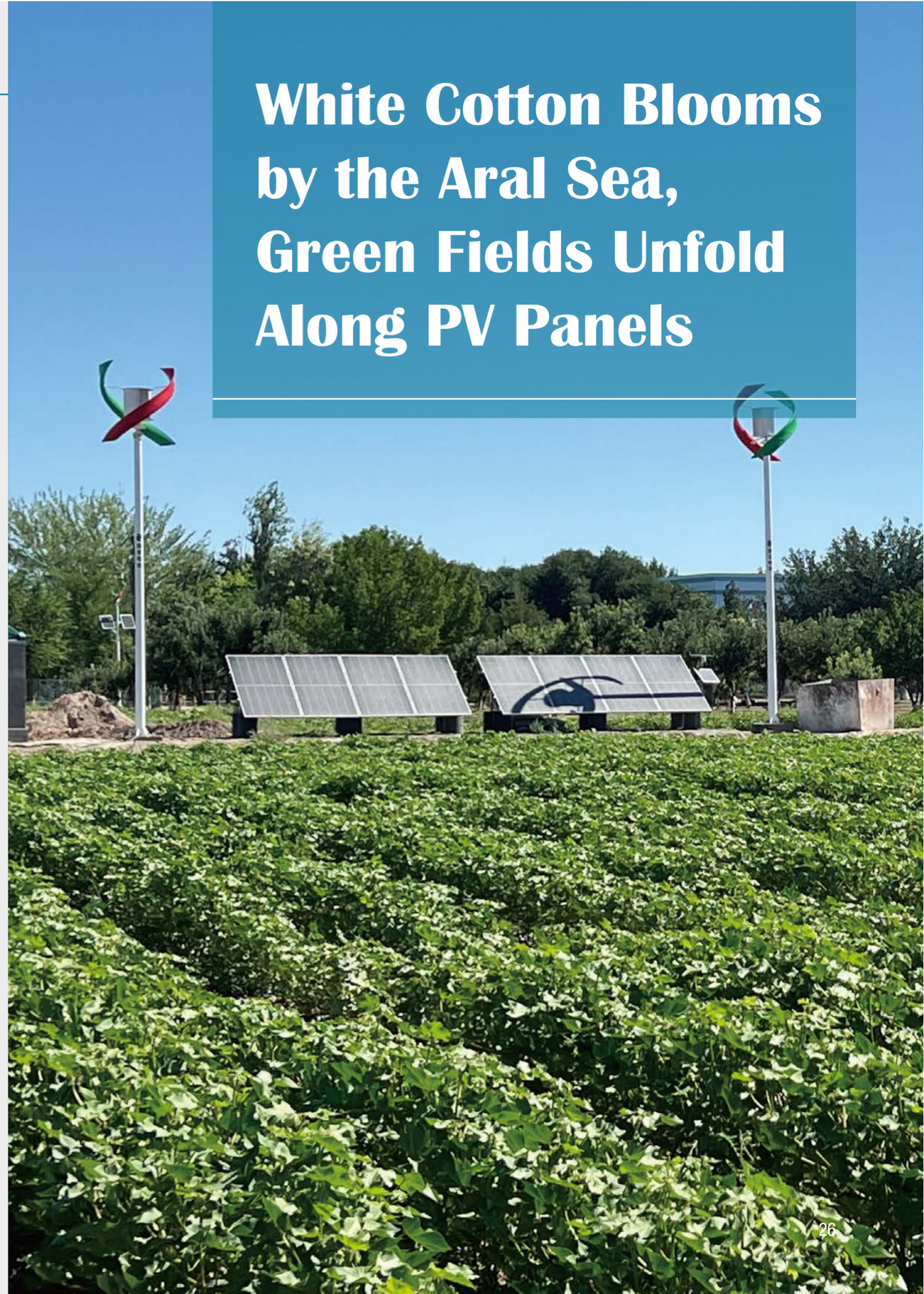


Letters of thanks received by NFC

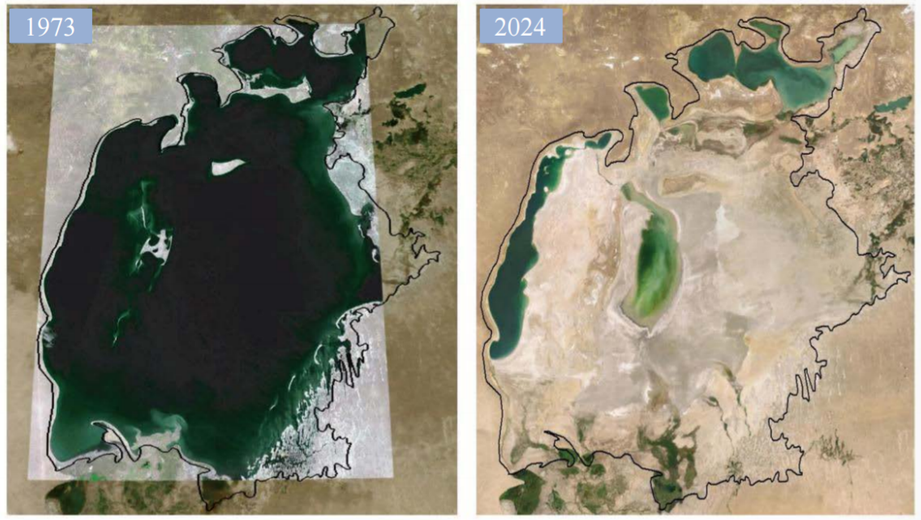
As a Kazakh proverb says, "Drops of water come together to form a mighty river." Every contribution, no matter how small, strengthens the partnership between China and Kazakhstan and adds lasting momentum to their shared journey toward green and sustainable development.

(Submitted by NFC Kazakhstan Ltd.)

White Cotton Blooms by the Aral Sea, Green Fields Unfold Along PV Panels



Once known as the "Tear of Central Asia", the Aral Sea was haunted by salt dust swirling across its dried lake bed, stretching endless barren saline-alkali land. The degraded ecosystem left a deep scar on this land.



Comparison of remote sensing images showing the surface changes of the Aral Sea

Today, a brand-new scene unfolds here: on demonstration fields near Nukus in Uzbekistan, snow-white cotton bolls hang heavy on branches, while neatly arranged photovoltaic panels glint brightly under sunlight. Intelligent drip irrigation belts deliver water and fertilizers precisely to the root of every crop. In the halophyte botanical garden of Muynak, saxaul and salicornia take root in saline soil, breathing vibrant life into land once barren of all vegetation. The "photovoltaic + integrated cotton water and fertilizer management" technology introduced by Chinese research teams is writing a win-win story of ecological restoration and people's livelihood improvement along the shores of the Aral Sea.

In 2023, the Xinjiang Institute of Ecology and Geography of the Chinese Academy of Sciences and Aksu branch of Co., Ltd. of Xinjiang Energy and Chemical Industry Group built the first water-saving cotton irrigation demonstration base at the Aral Sea International Innovation Center in Nukus of Uzbekistan, introducing Xinjiang's plastic film mulch drip irrigation and integrated water-fertilizer management technology. The demonstration fields yielded 5 tons of seed cotton per hectare, 2.5 times the local average output, while irrigation water consumption was only two-thirds of conventional usage. This dual breakthrough of high yield and water conservation drew constant visits from local farmers and agricultural specialists.

The project underwent major technical upgrades in 2024. Building on film mulch drip irrigation, researchers installed photovoltaic systems and intelligent integrated water and fertilizer machines to realize automatic, precise control of irrigation and fertilization. PV-powered underground water pumps channel water through drip pipes to crop roots, pushing seed cotton output on saline-alkali land to 2-3 times the local average. Calculated at the local seed cotton purchasing price, the output value of each hectare of demonstration land exceeds 33.54 million Uzbekistani Som (about 19,000 yuan), representing an over 200% increase in income compared with traditional farming practices. This strongly proves the economic viability of agricultural development on saline-alkali land.

Meanwhile, Chinese experts constructed a "photovoltaic + ecology" halophyte botanical garden in Muynak. PV water pumps extract groundwater to cultivate more than ten salt-tolerant species including salicornia, saxaul and kalidium, alongside salt-resistant forage grasses. China also donated 1.5 tons of halophyte seeds to support local saline-alkali land remediation. The salt-tolerant vegetation in the garden now thrives, with soil salinity markedly reduced, offering a replicable and scalable model for saline-alkali land improvement across the Aral Sea basin.

Remarkable ecological benefits have earned the project extensive social recognition. Amanbay Orinbayev, Chairman of the Supreme Council of the Republic of Karakalpakstan of Uzbekistan, sent a special letter of thanks to the Chinese research team for leveraging cutting-edge technologies to help the region tackle environmental challenges. Local technician Ismail Asanov noted that the project delivered unprecedented cotton yields locally, and expressed his wish to continue learning these advanced technologies for environmental improvement. Sharofiddin Tulaganov, a political observer, commented that the project balances ecological governance, livelihood enhancement and mutual trust building.



A local farmer carrys out field management at the halophyte botanical garden in Muynak, which also grows salt-tolerant crops

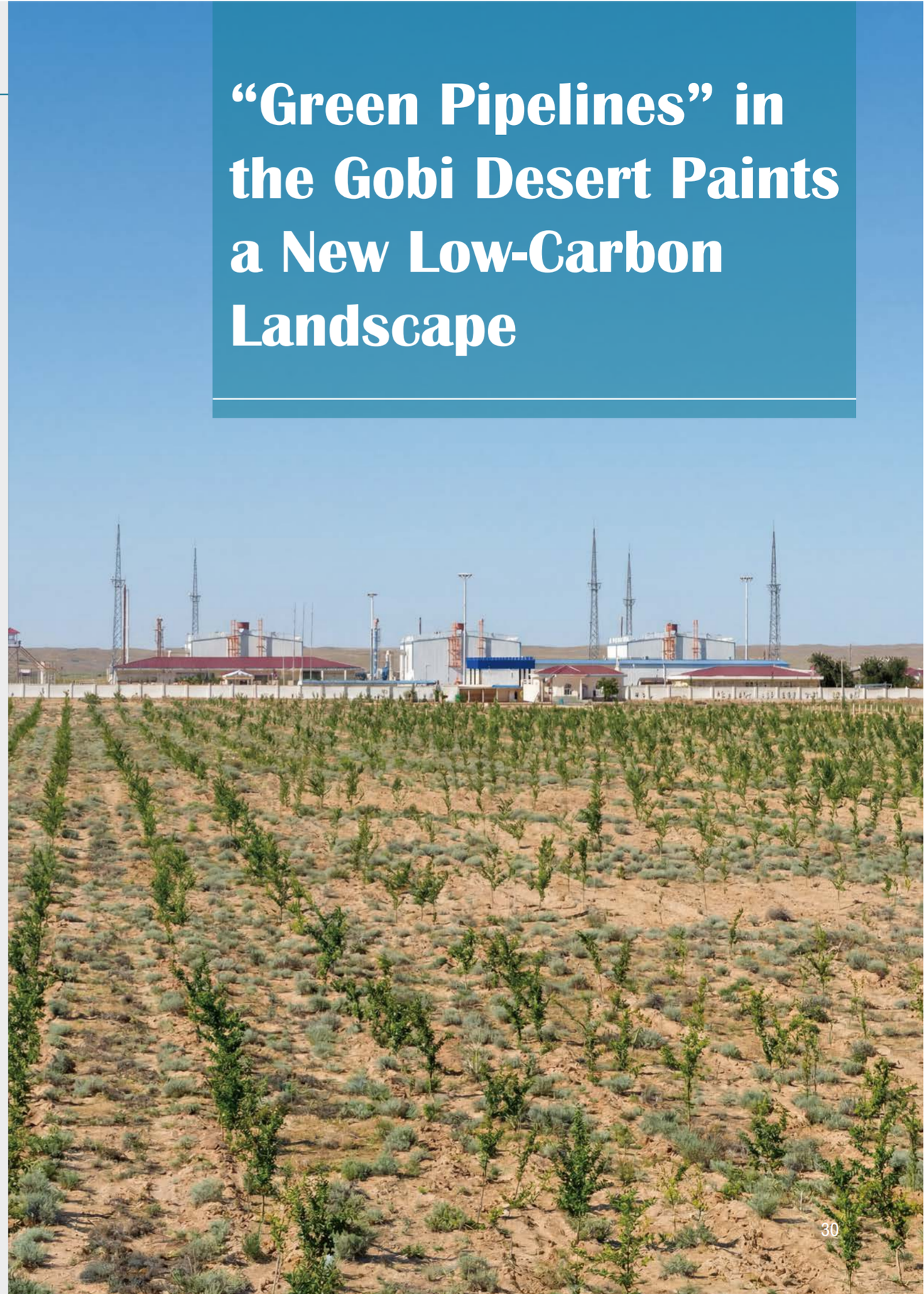
To advance the industrialization and localization of these technologies, China and Uzbekistan have jointly delivered training programs covering photovoltaic station operation and maintenance, water-saving irrigation and other techniques to boost local practitioners' expertise. At Uzbekistan's request, the project introduced sesame cultivation in 2025 to further validate the "photovoltaic + oil crop" model. Uzbek authorities stated their willingness to fund an expansion of the demonstration area to 100 hectares, scaling the technology from trial plots to large-scale commercial application.

In April 2024, the project was included in the Global Development Project Database of the China International Development Cooperation Agency. In May 2025, as a core achievement of the International Programme for Sustainable Development of the Aral Sea Basin, it was selected into the first batch of projects under the UN International Decade of Sciences for Sustainable Development and exhibited at UN Headquarters in New York, elevating its international influence to a global scale.

From the "Tear of Central Asia" to a beacon of green hope, cotton fields along the Aral Sea bear witness to the humanistic warmth of Chinese science and technology. Beneath photovoltaic panels, drip irrigation pipes quietly carry water and nutrients; within the halophyte garden, salt-tolerant forage sways gently in the wind. This once desolate saline-alkali expanse has become a bright emblem of the China-Central Asia community with a shared future.

(Submitted by: Xinjiang Institute of Ecology and Geography of the Chinese Academy of Sciences)

“Green Pipelines” in the Gobi Desert Paints a New Low-Carbon Landscape



Layered green belts stretch alongside the China-Uzbekistan Natural Gas Pipeline as it traverses the country. Oleasters, elms, and saxauls have taken root in the barren soil, while straw checkerboard sand barriers firmly hold mobile sand dunes in place. Inside the compressor stations, waste heat circulates and units operate via smart coordination, delivering a continuous supply of clean natural gas to thousands of urban and rural households. In the arid, ecologically fragile heart of Central Asia, a green corridor integrating energy supply security, desertification control, and low-carbon emission reduction is gradually unfolding across the vast Gobi of Uzbekistan.

As the Uzbekistan section of the China-Central Asia Natural Gas Pipeline, the construction and operation of this project align closely with the country's national initiative "Yashil Makon" (*Green Space*). Following a three-step framework of "oasis – green belt – green ecosystem", it delivers a model of ecological symbiosis in the desert. To address the challenges of sand erosion along the pipeline and low vegetation survival rates, the project has drawn on China's successful desertification control experience: it has laid 220,000 square meters of straw checkerboard barriers for sand fixation, strictly delimited construction zones, and sown grass seeds to restore the land surface upon project completion.

Centered around the UCS3 station, a 12.5-hectare greening zone is equipped with a scientific water-saving irrigation system. Featuring carefully selected drought-tolerant native saplings, over 10,000 trees have been planted to date. Supported by meticulous management – including quarterly fertilization, pest and disease control, and regular replanting – this once-vacant desert land has been transformed into a vibrant ecological barrier. Over the past decade, nearly 30,000 trees have been planted along the pipeline route, sequestering about 370 tons of carbon annually and boosting dust reduction efficiency by over 30 percent. Birds have returned to nest in the woods, and the desert ecosystem is gradually regaining its vitality.



Station Integrated Operation Diagram

Green development goes beyond sand control and afforestation; it is embedded in every technological innovation. Focused on energy conservation, consumption reduction, carbon cutting, and efficiency enhancement, the project has rolled out multiple low-cost technical upgrades. It has optimized the control logic of the compressor units to automatically switch to pressure-holding mode during shutdown, eliminating natural gas venting losses. It has interconnected the power supply and air compressor systems of adjacent stations to share equipment loads, significantly reducing gas self-consumption and power use. Furthermore, it has constructed three crossover pipelines to dynamically adjust gas transmission volumes and optimize unit operation loads, saving over 15 million cubic meters of self-consumed gas annually.

All 21 gas-driven compressor units along the pipeline are equipped with waste heat boilers, which recover heat from flue gas exceeding 400 ° C for winter heating, while R&D into waste heat power generation technology is actively underway to fully unlock the potential of circular resource utilization. Since commissioning, the pipeline has delivered a cumulative total of nearly 500 billion cubic meters of gas, replacing massive volumes of coal and sharply cutting carbon dioxide and sulfur dioxide emissions, achieving a win-win for both energy transmission and low-carbon development.

These locally rooted green practices have earned widespread recognition. The sprawling green belts have improved living conditions at the station sites, and greenhouses cultivating vegetables, fruits, and plants have created livable Gobi homes for frontline staff. The project's environmental achievements have been featured multiple times in prominent Uzbek publications, including the newspaper "Pravda Vostoka" (Eastern Truth) and "Tabiat" (Nature). The Navoi Regional Ecology Department specially delivered a letter of commendation, highly affirming the enterprise's outstanding contributions to local desertification control and the green economy. In 2021, the project obtained the first ISO 26000 social responsibility certification in the Central Asian region, setting a benchmark for sustainable development practices.

Looking ahead, this Silk Road energy artery will continue to deepen its green transition. It will expand greening coverage along the route to enhance the desert green belt ecosystem; it will advance technical upgrades for natural gas venting recovery to achieve zero direct resource discharge; and it will deploy integrated wind, solar, gas, energy storage, and hydrogen projects, launching a series of lightweight green demonstration initiatives.



O'ZBEKISTON RESPUBLIKASI EKOLOGIYA VA ATROF-MUHITNI MUHOFAZA QILISH DAVLAT QO'MITASI

BUXORO VILOYATI EKOLOGIYA VA ATROF-MUHITNI MUHOFAZA QILISH BOSHQARMASI

Letter of Commendation on Green Belt Construction from the Governments of Bukhara and Navoi Regions of Uzbekistan



O'ZBEKISTON RESPUBLIKASI BUXORO VILOYATI

HOKIMLIGI APPARATI

Генеральному директору СП ООО "Asia Trans Gas" Ли Чжигуан

Уважаемый г-н Ли Чжигуан,

Первый заместитель хокима Бухарской области



CERT International

ПОДТВЕРЖДЕНИЕ

СП ООО «Asia Trans Gas»

Республика Узбекистан, город Ташкент, проспект Мирзо Улугбека, 32 А

в области:

Транспортировка газа

соответствует требованиям стандарта:

ISO 26000:2010

ISO 26000 (Guidance on Social Responsibility) Certificate

The yellow sands stand silent, while the green trees bear witness. The gas pipeline running through the Gobi builds a bridge of China-Uzbekistan friendship through ecological restoration and technological innovation, continuously injecting enduring, sustainable green momentum into the joint construction of the Belt and Road Initiative.

(Submitted by China-Uzbekistan Natural Gas Pipeline Company)

Building a Plateau Thoroughfare, Safeguarding the Green Homeland

On the plateau over 1,800 meters above sea level in the Tyup District of Issyk-Kul Region, Kyrgyzstan, a 50-kilometer cross-border highway winds through mountains, grasslands and river valleys, linking eastern Kyrgyzstan with the border of Almaty, Kazakhstan. The area features long, harsh winters and an ecologically sensitive and fragile environment, with historical and cultural relics such as the Santashtamuran site scattered along the route.

Before China Road and Bridge Corporation (CRBC) completed the Phase III Road Rehabilitation Project of the Central Asia Regional Link, travel between Issyk-Kul Region and Almaty, Kazakhstan required a 460-kilometer detour along winding mountain roads, with a one-way travel time of 8 hours. The new route cuts the direct mileage to 280 kilometers and reduces one-way travel time by more than 60%, completely eliminating the travel woes caused by snow accumulation, avalanches and ice-induced traffic restrictions on the old road in winter.

Throughout project implementation, the Environmental, Social and Governance (ESG) philosophy has been consistently upheld. In terms of ecological protection, the project strictly follows the principle of "minimizing damage while prioritizing protection, reducing disturbance while strengthening prevention". Before construction, a comprehensive survey was conducted on the distribution of vegetation, water sources and ancient tombs to optimize the layout of access roads and temporary facilities, reducing the occupation of grasslands and farmland. Spoil dumps are fitted with annular intercepting ditches and retaining structures to strictly prevent soil erosion; native drought-tolerant plants are adopted for the restoration of roadbed slopes. During construction, regular water spraying is carried out for dust suppression, mixing stations are equipped with dust removal equipment, and oil and chemical products are stored in dedicated impermeable zones, strictly safeguarding the water quality of the glacial meltwater sourced from the Tyup River and Karkyra River. The project also invited Kyrgyz archaeological experts to implement protective measures for ancient tombs along the route, and adjusted the construction plan to avoid cultural relic areas, realizing the coordination of engineering construction and cultural heritage preservation.



Ecological view of the plateau wetland next to the project

In terms of livelihood support, eyond the scope of the project contract, the constructor repaired internal roads for three villages along the route — Sary-Talagoy, Santash and Karkyra — resolving the difficulties and safety risks faced by villagers in daily travel. In 2023, when Karkyra Village was struck by a flood, the project team immediately dispatched personnel and machinery to participate in emergency rescue and post-disaster reconstruction. During winter snow closures, the project department carries out regular snow clearance operations to keep passages in pastoral areas unobstructed. In January 2025, an elderly resident of Santash Village passed away. Days of heavy blizzards completely blocked the road from the village to the cemetery, leaving local funeral transport stranded. The village committee urgently appealed to the project department for help. The project manager immediately deployed large equipment including loaders and graders to the site for emergency snow removal, opening a safe passage from the village to the cemetery. This warm-hearted rescue in the snow not only addressed the villagers' pressing need, but also brought the company closer to the community emotionally.

Statistics show that during construction, the project created more than 1,500 local jobs in total, while prioritizing skills training programs to elevate the technical competence of local employees.



A CRBC employee at the construction site

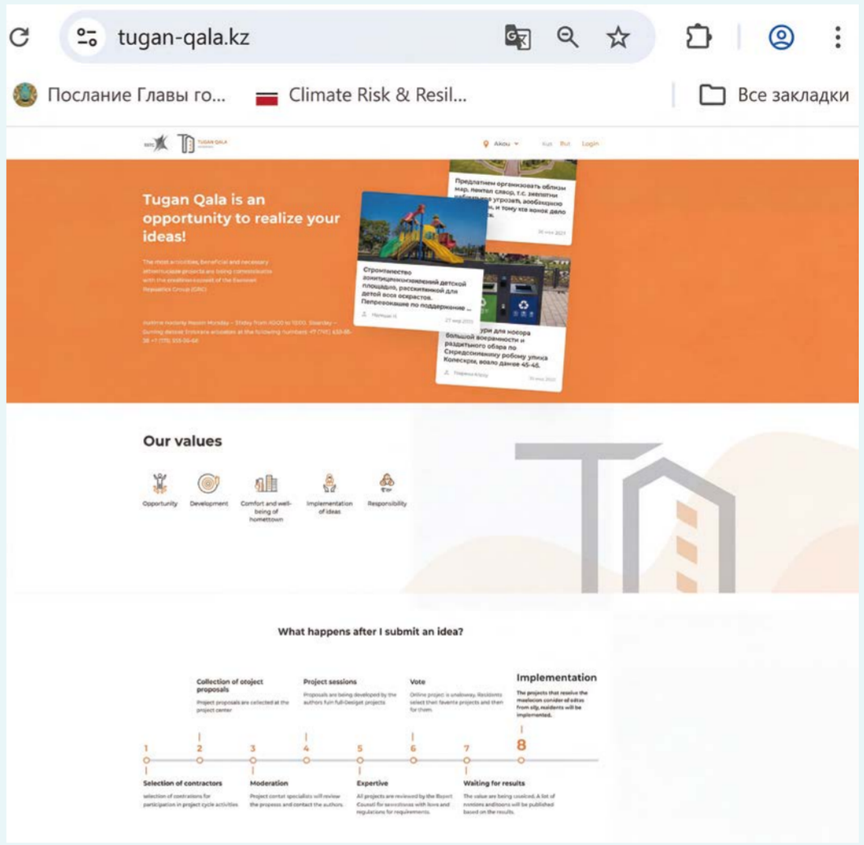
From meticulous protection of the plateau ecosystem, to heartfelt assistance for villages along the route, and to the connectivity dividends delivered by the project construction, experience has shown that the key to high-quality, sustainable development for enterprises in Central Asia lies in deeply integrating corporate growth with local ecological, social and governance needs. This approach delivers mutual benefits across economic, social and ecological dimensions, and provides lasting impetus for the joint construction of the Belt and Road Initiative.

(Submitted by China Road and Bridge Corporation)

Residents Vote to Decide Projects, Enterprises Fund and Co-Participate

ERG Kazakhstan Decarbonization Strategy

ECO-DOCUMENT



Tugan Qala Participatory Social Impact Ecosystem Portal and Workflow

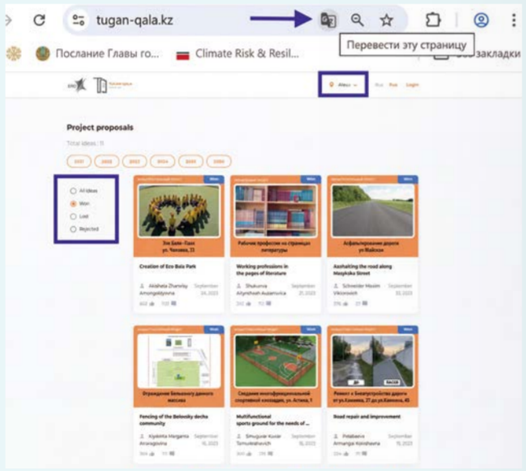
A unique community initiative is reshaping the landscape of monostructural industrial towns across Kazakhstan. Residents submit renovation proposals for public spaces online via mobile phones, all citizens vote openly to select priority projects, and local enterprises provide funding for implementation. Initiatives ranging from barrier-free riverside walkways and large murals on residential building facades to artistic installations in community plazas and children's playgrounds are all proposed, selected and supervised by local residents themselves. This participatory social impact ecosystem, known as Tugan Qala, was launched by Eurasian Resources Group (ERG).

Monostructural industrial towns in Kazakhstan have long been plagued by structural challenges: economies are overwhelmingly reliant on a single major employer, urban infrastructure investment lacks flexibility, formal mechanisms for citizens to engage in public affairs remain underdeveloped, and residents lack a strong sense of ownership over public spaces. Traditional corporate social responsibility (CSR) models centre on top-down capital injection and facility construction. While these can address short-term infrastructure shortages, they fall short of unlocking intrinsic community vitality and fostering residents' lasting sense of recognition and stewardship over development outcomes.

ERG has redefined corporate social responsibility as a participatory development framework built on three core principles: citizens make final decisions rather than enterprises conducting token consultations; projects respond to genuine grassroots needs instead of institutional assumptions; and communities share collective ownership of deliverables to guarantee long-term sustainability. Its flagship Tugan Qala platform delivers a full online engagement framework: residents independently submit project proposals, winning schemes selected through open community balloting receive corporate funding for delivery, and the entire process is subject to public oversight via the official website.

Between 2020 and 2025, Tugan Qala delivered a total of 197 community projects with cumulative investment of 1.73 billion tenge, with maximum individual project funding capped at 15 million tenge. Between 4% and 10% of each town's population cast direct votes on projects — a globally leading benchmark for participatory governance models. Steady growth has been recorded in the volume of submitted proposals and the number of active community leaders, alongside rising resident engagement year on year, demonstrating that the model has successfully shifted from externally incentivised participation to self-sustained grassroots momentum.

Tugan Qala has yielded a suite of innovations that transcend conventional municipal planning. In Aksu, residents transformed riverfront areas into fully accessible waterfront zones navigable by wheelchairs, a first for the city. In Khromtau, residents collectively voted to adopt the miner's helmet as the city's iconic symbol, integrating it into public space design to forge a distinct shared community identity. Across numerous towns, blank exterior walls of apartment blocks have been transformed into large-scale murals designed by residents, redefining local urban aesthetics. These upgrades have directly transformed residents' daily lives and social interactions.



Tugan Qala Participatory Social Impact Ecosystem Project Proposal Showcase

More than a standalone project platform, Tugan Qala has built a holistic ecosystem for civic participation spanning multiple domains:

Youth civic education: The Active Citizens School has trained 63 young students, who led 9 publicly voted, successfully implemented community projects.

University entrepreneurship incubation: Launched in 2017, the programme spans multiple higher education institutions, embedding entrepreneurship training into formal curricula.

Assistive technology hackathons for persons with disabilities: 16 editions have been held, generating multiple functional practical prototypes.

ALQA women's community leadership platform: Established in Khromtau, it operates peer support networks and delivers family empowerment programmes.

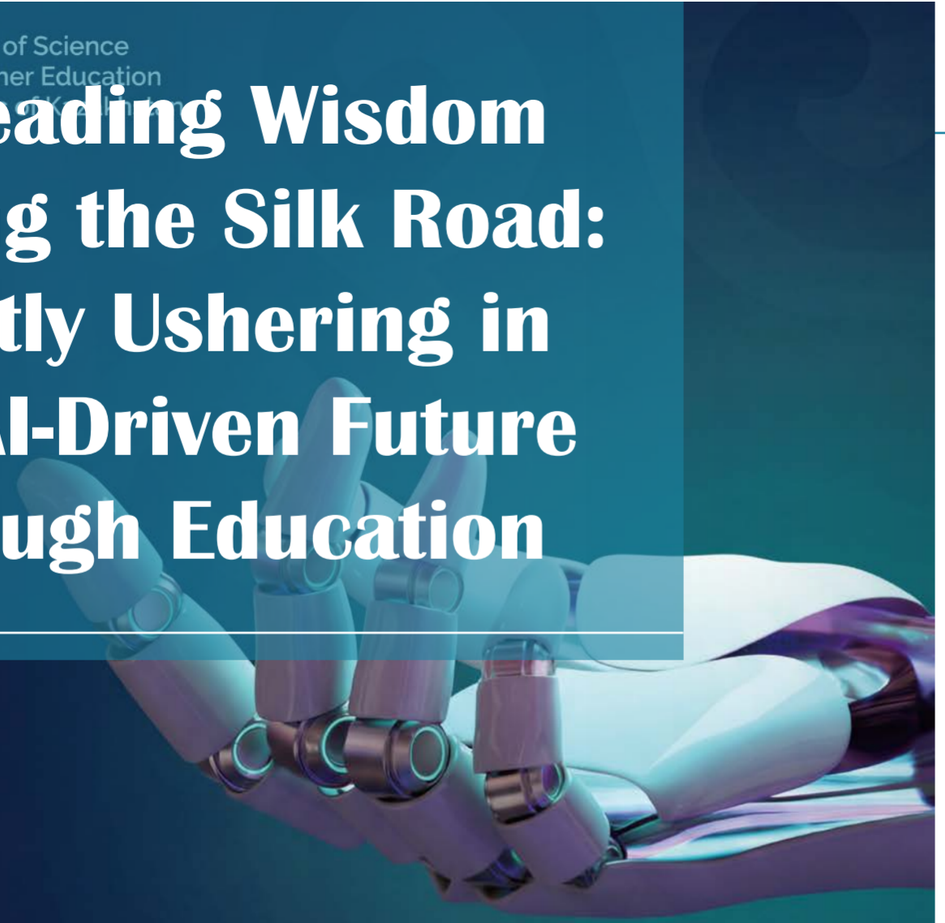
These interconnected schemes create a continuous pathway of participation, from individual capacity building to holistic community transformation.

The systemic impact of this model extends far beyond corporate boundaries. Participatory methodologies and governance tools pioneered under Tugan Qala are gradually being adopted by public authorities across Kazakhstan. Practical experience proves that when citizens are granted genuine decision-making power and corporate resources are deeply integrated with community ownership, even industrial towns long dependent on a single industry can unlock vibrant social dynamism.

(Submitted by Eurasian Resources Group)

Ministry of Science and Higher Education

Spreading Wisdom Along the Silk Road: Jointly Ushering in an AI-Driven Future through Education



AI-SANA

THE SPRINGBOARD OF TECHNOLOGY

INNOVATIVE AI PROGRAM

A PLATFORM FOR TECHNOLOGY DEVELOPMENT AND ARTIFICIAL INTELLIGENCE TRAINING

In computer labs at dozens of universities across Kazakhstan, young students are able to explore the realm of artificial intelligence step by step via an online learning platform — ranging from introductory basic concepts and deductions of core search algorithms to scenario-based practical applications across all industries. A complete talent development pipeline for artificial intelligence is taking steady shape in this Central Asian nation. This is the national AI talent development programme "AI-SANA", spearheaded by the Ministry of Science and Higher Education of Kazakhstan and rolled out for universities nationwide.

Initiated under the strategic arrangement announced by the President of Kazakhstan at the Digital Bridge Forum, the AI-SANA Programme centers on accelerating the improvement of nationwide AI literacy and fostering a solid talent pool to underpin the country's digital transformation. The project adopts a three-party collaborative model featuring government coordination, university implementation and industrial synergy: the Ministry of Science and Higher Education issues unified guidelines to formally integrate AI curricula into university academic frameworks; 45 partner universities nationwide undertake teaching delivery and student administration; as the strategic partner of the programme, Huawei Technologies Kazakhstan LLP leverages its mature ICT educational resources and technological strengths to deliver curriculum systems, online learning platforms and end-to-end technical support for the initiative.



Huawei AI Courses in Two Languages: English and Kazakh

To ensure inclusive and accessible educational resources, Huawei Technologies Kazakhstan LLP has translated three core AI courses — Introduction to Artificial Intelligence, Search and Artificial Intelligence, and Artificial Intelligence and Applications V2.0 — into Kazakh, enabling local students with limited foreign language proficiency to access cutting-edge AI content without barriers. Through the unified online learning platform, more than 250 ICT courses covering core fields including cloud computing, network communications and artificial intelligence are open to university students across Kazakhstan, forming a comprehensive digital skills learning framework spanning foundational to advanced levels.

To accommodate large-scale online learning with hundreds of thousands of users, Huawei Technologies Kazakhstan LLP has established a round-the-clock real-time technical support response mechanism to swiftly resolve various technical issues arising from concurrent access and guarantee the platform's long-term stable operation. Meanwhile, the learning reporting system generates real-time data on students' learning progress, course completion rates and participation activity, allowing educators to monitor teaching dynamics at any time and adjust teaching strategies promptly as needed. Huawei Technologies Kazakhstan LLP also organizes regular online training for teaching faculty to help university instructors master platform operations and teaching management tools, empowering academic administrations to continuously optimize curricula and delivery approaches.

Since its launch, the programme has delivered far greater outcomes than anticipated. To date, over 220,000 students have engaged with this learning ecosystem, more than 200,000 of whom have successfully completed foundational AI courses. This scale not only attests to the programme's robust execution and extensive coverage, but also vividly reflects Kazakh youth's strong aspiration and motivation to master digital skills.



Students of Huawei ICT Academy at Huawei ICT Competition

The AI-SANA Project demonstrates the immense potential of cross-border collaborative innovation among governments, academia and industry. Rather than merely migrating courses online, it has built a full-spectrum talent development system covering policy guidance, curriculum development, localized content adaptation, faculty training and learning progress tracking, injecting sustainable talent momentum into Kazakhstan's digital transformation and intelligent future.

(Submitted by Huawei Technologies Kazakhstan LLP)

Connecting the Silk Road with Iron Rails, Warming Hearts with Sincere Care



A 16,000 km railway network connects the vast territories of Kazakhstan — the world's largest landlocked country. From remote stations in the eastern mountains to locomotive depots in the western desert, once rudimentary rest rooms and outdated sanitary facilities are being replaced by modern spaces; the past dilemma where employee grievances could not reach management is now being resolved through multi-channel, transparent feedback mechanisms…

As Kazakhstan's largest employer, managing 116,000 employees, JSC National Company "Qazaqstan Temir Zholy" (KTZ) launched the "Favorable Working Conditions" (BLAGO) programme in 2022. Through systematic transformation, it is reshaping the workplace ecology of the national railway industry and injecting sustainable humanistic strength into the Central Asian transport corridor under the Belt and Road Initiative.

The railway industry has traditionally been associated with heavy physical labor, work in remote and harsh conditions, and high occupational risks. KTZ's linear enterprises — depots, stations, and track maintenance units — are spread across the entire country. How to ensure uniform standards of working conditions and corporate culture was once the greatest systemic challenge facing the industry.

The Favorable Working Conditions programme emerged in response to this challenge. Corresponding to five core corporate values — Safety (Bezopasnost'), Leadership (Liderstvo), Ambition (Ambitsii), Pride (Gordost'), and Responsibility (Otvetstvennost') — the programme became a central pillar of KTZ's Sustainable Development Strategy through 2029, aiming to ensure that every railway employee feels respected, protected, and empowered to grow.

The programme encompasses five interconnected pillars: regular independent engagement surveys through the Samruk Research Services (SRS) platform, generating indices for employee engagement, social well-being, and social cohesion; Industrial Relations Monitoring (IRM) — a proprietary bi-annual survey covering at least 25% of staff, evaluating 11 indices ranging from occupational safety to a "happiness at work" index; annual budget commitments in the tens of billions of tenge for systematic upgrading of sanitary and welfare infrastructure at linear enterprises; a multi-channel system for collecting, routing, and recording appeals; and fostering a culture of dialogue between staff and management with anonymous, protected communication channels.

Institutional innovation is the most prominent feature of this programme. For instance, KTZ established the position of Corporate Ombudsman — a first in the Central Asian railway industry — an independent advocate for employees' rights. The Ombudsman handles complaints related to violations of corporate standards, discrimination, and unfair treatment by management. The office operates on a confidential basis and gives employees access to protection outside the chain of command. The programme also adopted a Policy on Prevention of Harassment and Discrimination in accordance with ILO Conventions. In 2024, KTZ adopted a

corporate Human Rights Policy grounded in the UN Guiding Principles on Business and Human Rights (UNGP), covering labor rights and gender equality requirements for all company personnel and contractors.

Digitization transforms social climate management from "perceptual judgment" to "precision governance." All programme data is integrated into a unified analytic platform built on Microsoft Power BI. Real-time dynamic dashboards track employee appeals by region, branch, and issue type; complaint trends by year and month; IRM survey results broken down by each business unit; and "hot spot" regions on an interactive map of Kazakhstan. This enables management to forecast the social climate and proactively plan corrective measures. KTZ became the first company within the Samruk-Kazyna to complete full integration with the Nysana information system — the holding's unified complaints and appeals database — establishing a standardized nine-step process: registration, routing, verification, analysis, response, and entry into the dashboard, achieving closed-loop management from registration to feedback.

"Measurement only makes sense when converted into action" — this is the core principle of the Favorable Working Conditions programme. Systemic problems with sanitary and welfare conditions at linear enterprises identified in early survey iterations were quickly translated into nationwide upgrading projects. The establishment of the Ombudsman institution has led to a significant decline in collective appeals and substantially improved employee trust in management…

The Favorable Working Conditions programme makes the railway artery traversing Central Asia beat more powerfully. It carries not only the flow of goods and people but also the happiness and hope of more than 110,000 railway workers, providing a replicable benchmark for enterprises in Central Asia to practice sustainable development.

(Submitted by: JSC NationalCompany "Kazakhstan TemirZholy" (KTZ).)