



Article 6 Project Types and Cycle

A Toolbox series for Article 6
implementation

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Calculation of Credits

GHG or GHG class	Sources
CO ₂ : Carbon Di Oxide	Fossil fuel combustion, deforestation; agriculture
CH ₄ : Methane	Agriculture, land use change, biomass burning, land fills
N ₂ O: Nitrous Oxide	Fossil fuel combustion, agriculture; industrial
HFCs: Hydro fluoro carbons	Industrial / manufacturing
PFCs: Per fluoro carbons	Industrial / manufacturing
SF ₆ : Sulphur Hexa fluoride	Electricity transmission, manufacturing

GHG emissions contribute equally to climate change irrespective of where they occur.

Carbon Markets encourages investment in clean technologies in Developing Countries

Many emissions reduction opportunities are less expensive in developing countries

Developing countries are not saddled with old technologies; they have a choice to adopt new, clean technologies.

The Market 'rewards' emissions reduction of the 6 key Green House Gas. The 'Credits' are computed in equivalent Metric Tonnes of CO₂ (Carbon di Oxide), with multiples being assigned for converting each gas to its CO₂ equivalent eg. 1 MT of Methane = 21 MT of Carbon di Oxide, 1 Mt of SF₆ = 23,900 Mt CO₂.



NDCs

- Pakistan is signatory to the Paris Agreement
- Under the Paris Agreement, Pakistan has submitted targets of reducing emissions
- NDC = Nationally Determined Contributions through which Pakistan will reduce emissions through projects in identified sectors
- NDCs can be conditional (allowing outside finance) or unconditional (GOP to finance)
- 50% reduction by 2030 – 15% Unconditional and 35% Conditional
- Conditional NDC Carbon Credits can be sold to compliance buyers/ governments to use towards their own NDCs.
- This would thus generate **investments** in Pakistan, create jobs, improve environment and further revenue through fees to MOCC/GOP when credits are exported.



Corresponding Adjustments

- Carbon Credits generated in sectors which are not approved as unconditional NDC sectors can also be sold/exported to international governments/buyers to use towards their own goals under Article 6 of Paris Agreement
- These credits are called ITMOS having “corresponding adjustments” as they get correspondingly adjusted in both countries emission inventories and can earn price in multiples and attract foreign investors to invest in carbon projects in Pakistan
- To sell these credits abroad or attract investments in these sectors, Ministry of Climate Change has to issue Letter of Authorization (LOA) to project investor to allow future export of credits
- A carbon policy is has been approved and rules of policy are awaited which will set the rules for LOAs, Fees, Application procedures, export procedures and accounting of emissions
- **MOCC/GOP/Provincial Gov will earn fees/shares per credit resulting in further funds for climate projects**



Fees

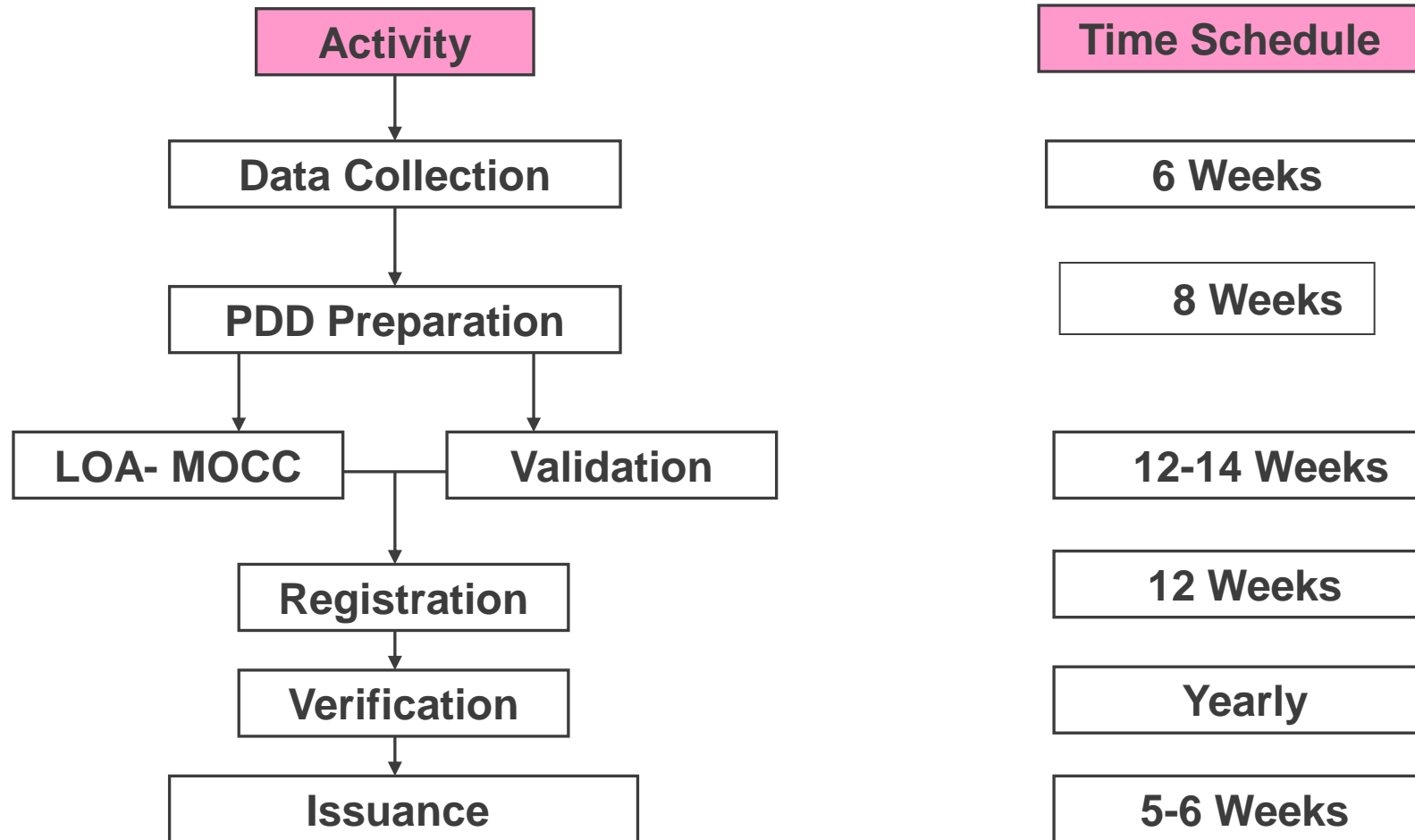
- 5% of the credits generated by the project shall be deducted at source, in the form of credits
- Maximum Corresponding Adjustment Fee (CAF) calculated at 12% of net revenues generated from the sale of carbon credits.
- Administrative Costs, equating to 1% of gross revenues generated from the sale of carbon credits
- Reasonable fee structure with no strings attached:
 - Total fee charged @ 18% of the value- reasonable
 - If Sale Price of ITMO \$15/credit
 - $\$15 \times 18\% = \$2.7/\text{credit}$
 - Very low and favorable as compared to other nations where fee is above \$4-5/credit

- Sample Sectoral Scope's under which a carbon project can be developed.

Scope Number	Sectoral Scope
1	Energy industries (renewable - / non-renewable sources)
2	Energy distribution
3	Energy demand
4	Manufacturing industries
5	Chemical industries
6	Construction
7	Transport
8	Mining/mineral production
9	Metal production
10	Fugitive emissions from fuels (solid, oil and gas)
11	Fugitive emissions from production and consumption of halocarbons and sulphur hexafluoride
12	Solvent use
13	Waste handling and disposal
14	Afforestation and reforestation
15	Agriculture



Project Development Cycle





The entire process can be finished in 12-18 months. The process involves following steps:

- **Feasibility Study** - It includes analysis or assessment of the project emission reduction potential and other attributes by an advisor and preparation of Project Idea Note (PIN)
- **Preparation of Project Document (PD)** - The advisor prepares a PDD using various standards and available methodologies.
- **MOCC Authorisation for 6.2 or Host Country Validation for 6.4** – The process to get credits labelled as ITMOS from MOCC and paying a fee for that
- **Validation** - The project is validated normally by the same Validators as for CDM such as DNV, SGS, TUV etc. to obtain a Validator's certificate for the project .
- **Verification** - Verification is also done to by Verifiers (same as validators) to assess the quantum of credits to be issued to a project in any assessment period based on project monitoring report and site visits
- **Issuance** - Once, verification is done, issuance certificate is provided to the project.
- **Finding a Buyer** - It involves finding a suitable buyer with similar requirements for VERs to ensure good price and establishing emission reduction purchase agreement (ERPA)



Baseline Concept

- **Baseline** is the scenario that reasonably represents the emissions that would occur in the absence of the proposed project activity.
- It has significant bearing on the no. of Credits awarded to a project.
- Baseline assessment methodologies are approved by carbon standard.
 - If a methodology is already approved, other projects could use the same methodology
 - New methodologies can be designed based on UNFCCC guidelines.



Additionality Concept

- Additionality means that the project would not have come about on its own- ***it is not the most likely baseline scenario***
- Additionality is difficult to prove. Standard is the ultimate authority to decide whether a project would have gone ahead without the carbon revenue.
- Projects found to be of Business-as-usual (BAU) or free-riding type stand chances of rejection and need very careful projection.
- In addition to technical proofs of additionality, project sponsor has to prove that he wouldn't have taken up the project without carbon benefit.

This needs documentary proofs that right from conceptualization stage, the project was justified on the basis of carbon benefits.

Projects which are already under implementation may find it difficult to meet the additionality criteria.



Monitoring

- ▶ Monitoring plan should be in line with methodology used for the project
- ▶ Data collection, frequency, method of measurement & recording, Calibration procedures, internal audit plans etc
- ▶ This is the most important part of any project; it is utmost important that monitoring plan detailed out in the PDD is adhered to fully in actual situation



Designing a Deal

- **Spot sale** to capture high spikes in the market prices; Major advantage of spot sale is that credits always get the market price, however downsides are:
 - Huge downside risk in case of a price crash (moderate probability of price decline)
 - Uncertainty regarding timing of sale, this might create uncertainty in annual cash-flow as well





Designing a Deal

- **Forward sale** for increasing certainty about carbon revenue; forward sale structure could be done in following way
 - **Fixed Price Contract:** From risk management point of view a very good structure as a fixed price has been locked in for a long period. No impact of changing market conditions.
 - **Floating Price Contract:** A formula for price discovery would be set with buyer for period for a forward contract. Not very different from spot sale structure except for the fact that effort required for deal closure is minimized.
 - **Floor + Floating:** A floor price for downside risk protection + sharing of positive difference benchmark and Floor
 - Above structure is very good as it takes care of downside risk at the same time provide upside potential as well



Lakhodair Dumpsite Landfill Gas Recovery

Opportunity Summary		Project Financials	
Ministry	<ul style="list-style-type: none">Ministry of Climate Change	Project Cost 20 Million USD	Project IRR 10 – 12 %
Project description	<ul style="list-style-type: none">A Greenfield Investment in Landfill Gas Recovery ProjectLandfill in use since 2016; existing waste about 20 million tons, receiving around 5000 tons per day		
Market Dynamics	<ul style="list-style-type: none">High demand for Methane Projects delivering ITMOSDistribution of methanized landfill gas through the existing natural gas supply system in LahoreIt has strong social, environmental, and health co-benefits		
Unique value proposition	<ul style="list-style-type: none">High quality Carbon creditsEstimation of 350,000 reduction tCO2e per year for 10-15 yearsSupported by an existing CDM MethodologyThe project may thus comfortably be fully financed through carbon credits	Equity IRR 18 – 20%	Payback 4 - 6 years
Business Model	<ul style="list-style-type: none">It might be offered to an investor on a BOT basis where the return on the investment could be a guaranteed issuance of ITMOsDistribution of methanized landfill gas through the existing natural gas supply system in Lahore may be technologically.Off-take of biodiesel for fleets of vehicles may considered be legally easier, but technologically complex.		
Investment	<ul style="list-style-type: none">20 m USD, which means an abatement cost of 1.7-2.5 USD/tCO2e		
		Assumptions: 30% equity investment, 70% loans, at interest rate 8% per year; ITMO price: USD 15 per tCO2e; 18% host country fees; project crediting period: 10 years Emission reductions: Estimated at 350,000 tCO2e/year . At \$12/tCO2e , the project would generate \$4.2 million USD annually. At \$15/tCO2e , the project would generate \$5.25 million USD annually.	

Daewoo E Bus and Solarization (2 in 1)

Opportunity Summary	
Ministry	<ul style="list-style-type: none"> Ministry of Climate Change
Project description	<ul style="list-style-type: none"> Diesel Buses Fleet replacement: Induction of 200 inter-city e-buses/coaches to replace diesel buses deployed on short routes over 2 years 17 short routes up to 200-220 km range
Market Dynamics	<ul style="list-style-type: none"> Solar panels are being installed at the roof-tops of bus terminal buildings with power generation capacity of 4 MW by the end of 2025 at 17 major bus terminals. It has strong social, environmental, and health co-benefits
Unique value proposition	<ul style="list-style-type: none"> Estimated Green House Gas (GHG) Emissions reduction of 51,600 tCO₂ / year. Factoring in Grid emission factor, net emission reduction of 24,442 tCO₂ / year From May 2023 till date, solar capacity of 1.58 MW has already been installed at 7 major bus terminals. Further 1.22 MW will be installed over the next 6 months at 5 more bus terminals. By end of 2025, another 5 locations will be covered to bring the total capacity to 4 MW.
Business Model	<ul style="list-style-type: none"> 200 buses will travel an estimated 43.56 million km / year Charging of buses will be carried out at Daewoo Bus Terminals only (charging at origin, and then at destination for return journey) This partial replacement of Diesel bus fleet will result in non-consumption of approximately 12.8 million liters of diesel /year Grid Electricity will be used to energize buses
Investment	<ul style="list-style-type: none"> 104 Million USD

Project Financials	
Project Cost 104 Million USD	Project IRR 12– 15 % (Diesel Savings, Revenue from Carbon Credits) Total Annual Benefits = \$13 Approx.
Equity IRR 20 – 25 %	Payback 8 Years

Assumptions: **Equity Investment:** 30% of the total project cost
Loan Financing: 70% of the total project cost at an interest rate of 8% per year
ITMO Price: USD 15 per tCO₂e
Host Country Fees: 18% of carbon credits revenue
Project Crediting Period: 10 years

Construction of 5 MW Naran HPP (Jheel Road) District Mansehra, Khyber Pakhtunkhwa

Opportunity Summary	
Ministry	<ul style="list-style-type: none"> Ministry of Climate Change
Project description	<ul style="list-style-type: none"> A Greenfield Investment in Hydropower Project The layout of project considered including location of its various components including intake structure, Connecting Channel, gravel spill, sand trap, Reject weir, Headrace Box Channel, Forbay, Spillway, Penstock, Power House, Tailrace channel, Access road and Residential colony.
Market Dynamics	<ul style="list-style-type: none"> The project does not include methane capture of legacy waste High demand for Methane Projects delivering ITMOS
Unique value proposition	<ul style="list-style-type: none"> Improvement in energy sector and adding cheaper and environment friendly source. Saving the foreign exchange by not importing fuel that is used in alternative thermal plant. Availability of reliable and cheap electricity will provide incentive for industrialization commercial activities resulting in economic uplift. Saving of firewood, hence increase in trees and reduction in soil erosion.
Business Model	<ul style="list-style-type: none"> A gross head of 211 m with design discharge of 6m³/s would generate 5 MW. Revenue to the government through sale of energy as well as due to levies and taxes. Improvement of infrastructure and social uplift in the project area by providing jobs during construction as well as operation stage. Bridge the gap between demand and supply of basic necessity i.e., Electricity.
Investment	<ul style="list-style-type: none"> PKR 2800.00 Million Project cost investment (1 USD = 280 PKR)

Project Financials	
Project Cost \$ 10 Million	Project IRR 10 – 12%
Equity IRR 24.05%	Payback 3 – 5 Years

Assumptions: **Equity Investment:** 30% of the total project cost; **Loan Financing:** 70%
ITMO Price: USD 15 per tCO₂e
Host Country Fees (18%)

Net ITMO Revenue: USD 134,685/year
Total Annual Revenue: USD 1.88 million/year
Annual Loan Payment: USD 814,000/year
Annual O&M Costs: USD 250,000/year

Peshawar Landfill Site

Opportunity Summary		Project Financials	
Ministry	<ul style="list-style-type: none">Ministry of Climate Change	Project Cost 40 M USD	Project IRR 8 – 10 %
Project description	<ul style="list-style-type: none">A Greenfield Investment in Landfill ProjectIntegrated waste management projects in four cities		
Market Dynamics	<ul style="list-style-type: none">The project does not include methane capture of legacy wasteHigh demand for Methane Projects delivering ITMOS		
Unique value proposition	<ul style="list-style-type: none">High quality carbon creditsAssessed emissions reduction potential is 300,000 tCO2e/yearSupported by an existing MethodologyStrong sustainability qualitieshigher costs of toward waste management compared to backward tidying up.	Equity IRR 12 – 18 %	Payback 6 - 8 years
Business Model	<ul style="list-style-type: none">It is already loan financed by ADB and thus may raise additionality concernsIt is expected to be implemented on BOT basis without immediate considerations for revenues from the carbon market		
Investment	<ul style="list-style-type: none">40 million USD investment	<div>Assumptions: 30% equity investment, 70% loans, at interest rate 3% per year; ITMO price: USD 12 - 15 per tCO2e; 18% host country fees; project crediting period: 15 years</div> <div>•Emission reductions are estimated at 300,000 tCO2e/year.</div> <div>•At an ITMO price of \$12/tCO2e, the project would generate \$3.6 million USD annually.</div> <div>•At an ITMO price of \$15/tCO2e, the project would generate \$4.5 million USD annually.</div>	

Brick Kilns Project

Opportunity Summary		Project Financials	
Ministry	<ul style="list-style-type: none">Ministry of Climate Change	Project Cost 50 m USD	Project IRR 15 - 20% (under BOT schemes with carbon credits as a primary revenue source) Highly Scalable
Project description	<ul style="list-style-type: none">An Umbrella Project for Brick Kilns in PunjabAn emissions reduction projectThe project encompasses 1000 out of 13000 small brick kilnsInherently programmatic so there is no reason to limit the numberThe projected costs per zig-zag kiln is 3 times higher than estimates in India, the efficiency gain is 15% compared to 20% in India, and the crediting period is set to 5 year instead of 10Budget is only 30% of the total investment required – or alternatively, with Indian prices, the project covers the full cost of the conversion.		
Market Dynamics	<ul style="list-style-type: none">Project characteristics would probably have significant appeal to government and corporate buyers alikeImmense sustainable development benefits due to current air pollution	Equity IRR 20 – 30 %	Payback 3-5 years
Unique value proposition	<ul style="list-style-type: none">High quality carbon creditsAssessed emissions reduction potential is 370,000 tCO2e/yearExtended cooperation and capacity building on both sidesSupported by an existing MethodologyStrong sustainability qualities		
Business Model	<ul style="list-style-type: none">It is expected to be implemented on BOT basis without immediate considerations for revenues from the carbon marketPrivate sector will be encouraged to participate	Assumptions: 30% equity investment (\$15 Million), 70% loans (\$35 Million), at interest rate 7% per year; ITMO price: USD 12 - 15 per tCO2e; 18% host country fees; project crediting period: 10 years	
Investment	<ul style="list-style-type: none">50 m USD		

Biogas for Households in Khyber Pakhtunkhwa

Ministry	<ul style="list-style-type: none"> Ministry of Climate Change
Project description	<ul style="list-style-type: none"> A Greenfield Investment in Biogas for households in KP An emissions reduction project Installation of 70,000 household size biogas digesters at the target households and provision of technical support for biogas digester installation and commissioning A PoA model which makes it scalable across the country Has potential in terms of gradual implementation and thus does not require the full implementation finance up front May be fully financed through carbon credits
Market Dynamics	<ul style="list-style-type: none"> It has strong sustainability qualities and may attract buyers. Immense sustainable development benefits due need for energy in rural areas
Unique value proposition	<ul style="list-style-type: none"> High quality carbon credits Assessed emissions reduction potential is 500,000 tCO₂e/year Supported by an existing Methodology (CDM AM0075) Community based project which advances the uplift of poverty struck agriculture areas and families.
Business Model	<ul style="list-style-type: none"> Community based project which advances the uplift of poverty struck agriculture areas and families. By capturing and utilizing methane, biogas technology reduces greenhouse gas emissions, mitigates climate change, and provides a sustainable energy source for rural communities.
Investment	<ul style="list-style-type: none"> 30 M USD

Project Financials	
Project Cost 30 M USD	Project IRR 12 – 18 %
Equity IRR 15 – 22 %	Payback 5 - 6 years

Assumptions: 30% equity investment, 70% loans, at interest rate 3% per year; ITMO price: USD 12 - 15 per tCO₂e; 18% host country fees; project crediting period: 10 years.

Carbon credit revenue expected to reach **\$6-7.5 million USD** per year, depending on ITMO prices.

NRSP Improved Cookstove Project

		Project Financials	
Ministry	<ul style="list-style-type: none">Ministry of Climate Change	Project Cost 7 M USD	Project IRR 12 – 18 %
Project description	<ul style="list-style-type: none">Distribution of free cookstoves to rural familiesFamilies to be enrolled which cook food using open fire methodReduces fuelwood consumptionAvoids deforestationLowers GHG emissionsMultiple SDGs coveredLess indoor pollutionPositive health impact		
Market Dynamics	<ul style="list-style-type: none">It has strong sustainability qualities and may attract buyers.Immense sustainable development benefits due need for energy in rural areas	Equity IRR 15 – 22 %	Payback 2 - 3 years
Unique value proposition	<ul style="list-style-type: none">High quality carbon credits with multi layered MRVAssessed emissions reduction potential is 230,000 tCO2e/yearBeing designed under Gold StandardCommunity based project which advances the uplift of poverty struck agriculture areas and families.		
Business Model	<ul style="list-style-type: none">Expected to be completely finance through carbon financeDiscussions ongoing with provincial government to support MRV for further transparency and integrityUplift livelihoodsGenerates employment	Assumptions: 100% Equity Investment; ITMO price: USD 12 - 15 per tCO2e; 18% host country fees; project crediting period: 5 years. Carbon credit revenue expected to reach \$3.5-4.5 million USD per year, depending on ITMO prices.	
Investment	<ul style="list-style-type: none">7 M USD		

Generation of Mangrove Carbon Credits

Opportunity Summary	
Ministry	<ul style="list-style-type: none"> Ministry of Climate Change
Project description	<ul style="list-style-type: none"> Balochistan-Sonmiani Khor, Kalamat Khor, Sahidi Khor, Sawar Khor, Shabi & Ankra Creeks, Jiwani (5690 ha) An emissions reduction project May be fully financed through carbon credits Stages: Signing of LOI, Development of PDD, Registration by International Body, Periodic monitoring, Offer of Credits etc Stages: Signing of LOI, Development of PDD, Registration by International Body, Periodic monitoring, Offer of Credits etc.
Market Dynamics	<ul style="list-style-type: none"> It has strong sustainability qualities and may attract buyers In 2022, about 30% of all carbon offset credits for forestry projects came from voluntary registries, including IFM, REDD+, and afforestation, among other types Data also suggests that in Asia and Central America, each credit for blue carbon projects costs the range between \$13 – \$35
Unique value proposition	<ul style="list-style-type: none"> High quality carbon credits Assessed emissions reduction potential is 500,000 tCO₂e/year Supported by an existing Methodology Afforestation, conservation and regeneration of forests and green landscapes Improved resilience in terms of climate and environment Multiple co-benefits such as improved health, revenue generation, air quality and more
Business Model	<ul style="list-style-type: none"> The business model for this Article 6 mangrove carbon credits project relies on revenue from ITMO sales, funded by a mix of 30% equity and 70% concessional loans.
Investment	<ul style="list-style-type: none"> 47.99 M USD

Project Financials	
Project Cost	Project IRR
47.99 M USD	12 – 18%
Equity IRR	Payback
20 – 25 %	5 - 7 years

Assumptions: 30% equity investment, 70% loans, at interest rate 3% per year (assuming concessional finance or green bonds).; ITMO price: USD 12 - 20 per tCO₂e; 18% host country fees; project crediting period: 10 years

Carbon Credits through Production of LC3 Cement

Opportunity Summary	
Ministry	▪ Ministry of Climate Change
Project description	▪ The LC3 Cement Project aims to establish Pakistan's first production facility for LC3 (Limestone Calcined Clay Cement), which offers significant reductions in CO ₂ emissions (up to 30–40%) and production cost savings. The initiative will reduce dependence on imported fuels, increase sustainable housing and infrastructure options, and position Pakistan as a leader in sustainable cement technology.
Market Dynamics	▪ LC3 Cement is gaining global attention as a sustainable alternative to traditional cement, driven by increasing demand for low-carbon materials in construction. The project's success depends on adequate supply of kaolinite-rich clay, market acceptance, and alignment with green public procurement policies to establish consistent demand.
Unique value proposition	▪ LC3 Cement offers dual benefits of cost reduction and emission mitigation. By replacing up to 50% of clinker with calcined clay, it reduces both production costs and environmental impact. This project supports Pakistan's climate goals and provides a more affordable, sustainable construction material, benefiting public and private sectors alike.
Business Model	▪ The project will generate revenue through cement sales and carbon credits under Article 6 of the Paris Agreement. It leverages concessional finance, potential green bonds, and carbon credit revenue to offset high CAPEX.
Investment	▪ CAPEX 30 Million USD Approx.

Project Financials	
Project Cost 30 Million USD	Project IRR 12 – 15%
Equity IRR 18 – 28%	Payback 5 – 8 years

Assumptions: 30% equity investment, 70% loans, at interest rate 3% per year (assuming concessional finance or green bonds).; ITMO price: USD 12 - 20 per tCO₂e; 18% host country fees; project crediting period: 10 years

Thank you

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