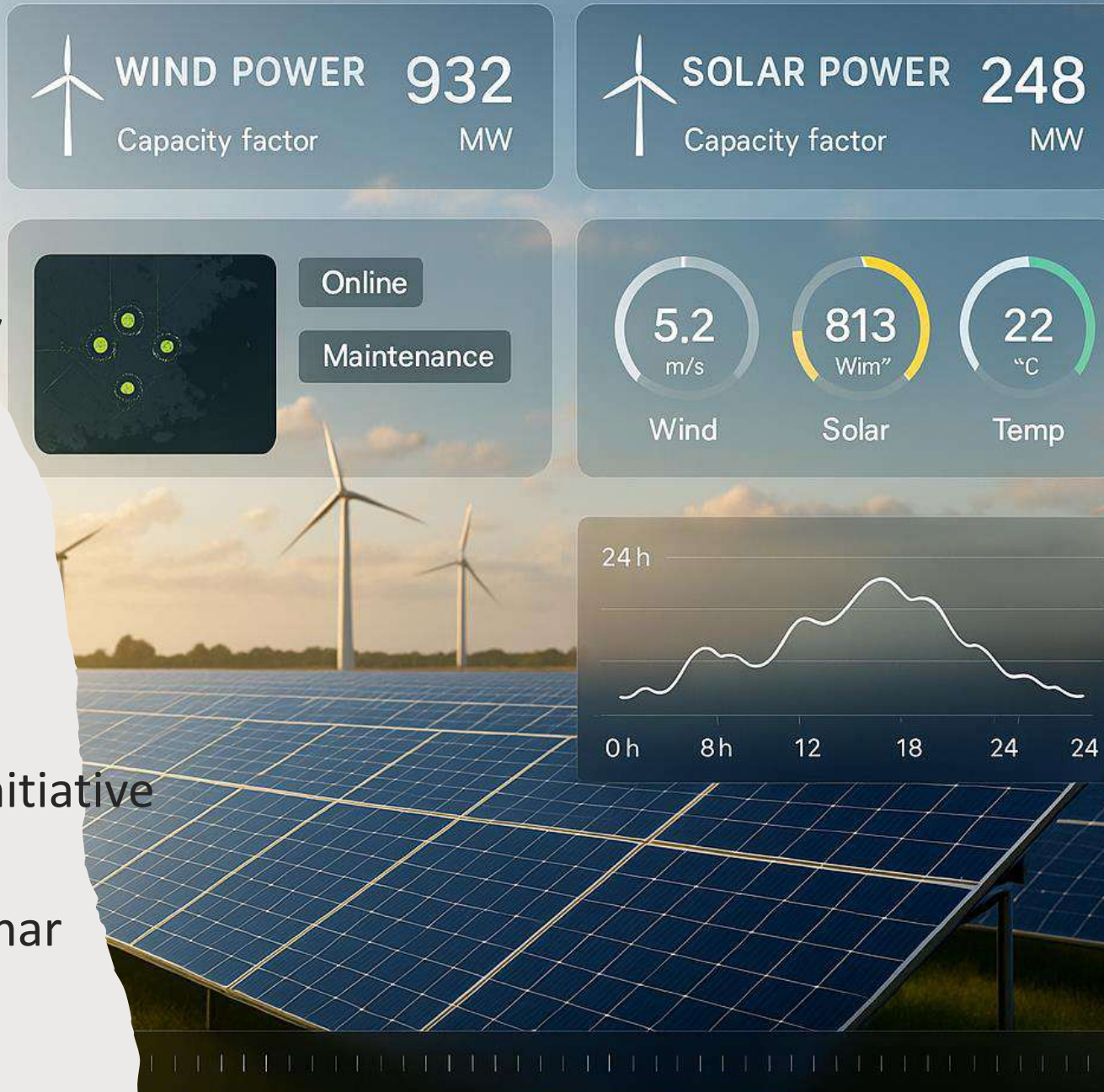


Project Management Consulting for Renewable Energy Projects (Focus on Solar & Wind Power)

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Session Overview / Agenda



Introduction to PMC

- What is Project Management Consulting and its importance in renewable energy projects

Role of PMC in Renewables

- How PMC adds value in solar & wind project development

Key Components

- Feasibility, Financing, Regulatory compliance, Risk management, Procurement, Construction oversight, Stakeholder engagement, Performance optimization (overview of each)

Challenges & Solutions

- Specific challenges in solar and wind projects, and consulting approaches to address them

Case Studies

- Global example and SAARC regional example demonstrating successful PMC in action

Q&A

- Interactive discussion and key takeaways

What is Project Management Consulting (PMC)?

– Overview

Definition

- Guiding and supporting project stakeholders through the planning, execution, and completion phases of a project.

Scope of Services

- Project managers/consultants assist with feasibility studies, design optimization, financing strategies, regulatory approvals, risk mitigation, procurement processes, construction supervision, and commissioning.

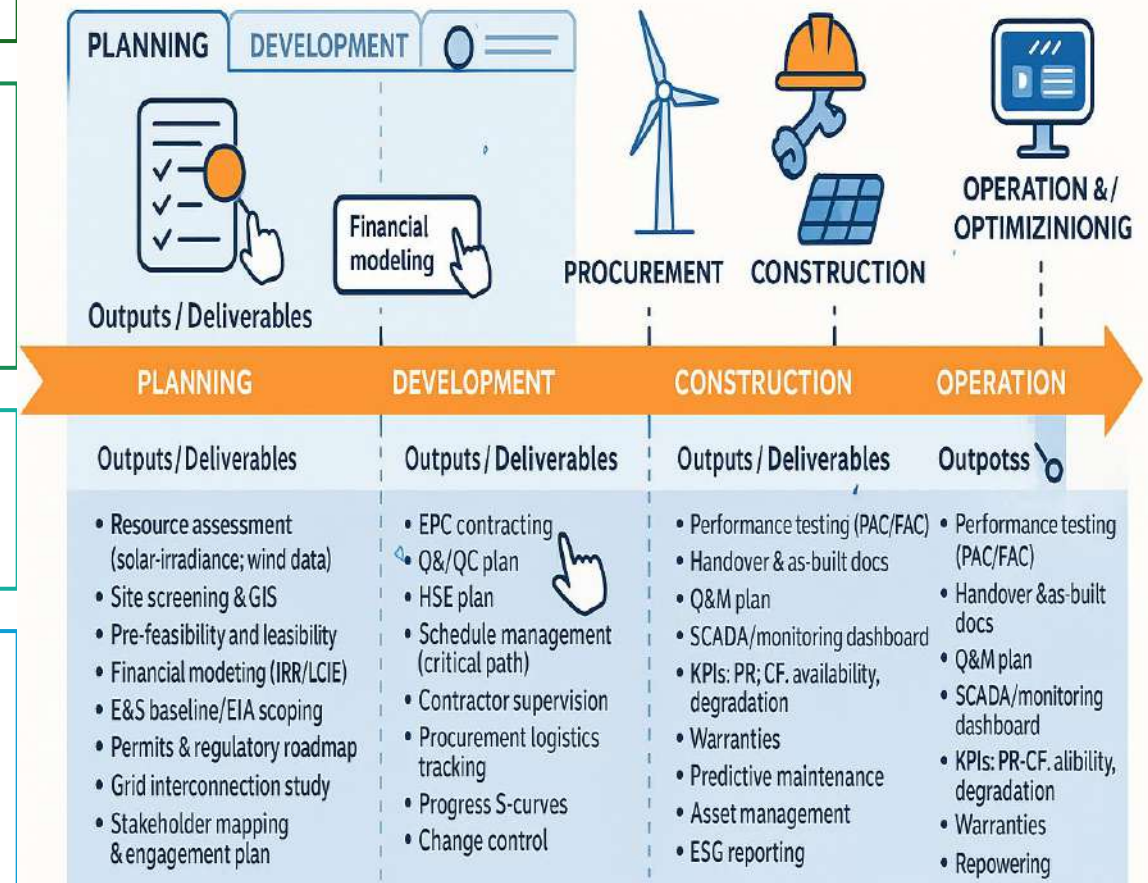
Objective

- Ensure projects are delivered on time, within budget, and to quality and safety standards.

Increasing Importance

- In the era of global energy transition and rapid tech advancements, effective PMC is essential to harness local resources, reduce costs, mitigate risks, and ensure compliance with environmental/regulatory standards.

Renewable Project Lifecycle & PMC Activities



PMC's Role in Renewable Energy Projects – Why It Matters

Ensuring Project Success

- PMC provides a structured approach to handle complexity and deliver successful outcomes.

Risk & Cost Management

- Strong project management reduces cost overruns by early risk identification and mitigation.

Quality and Compliance

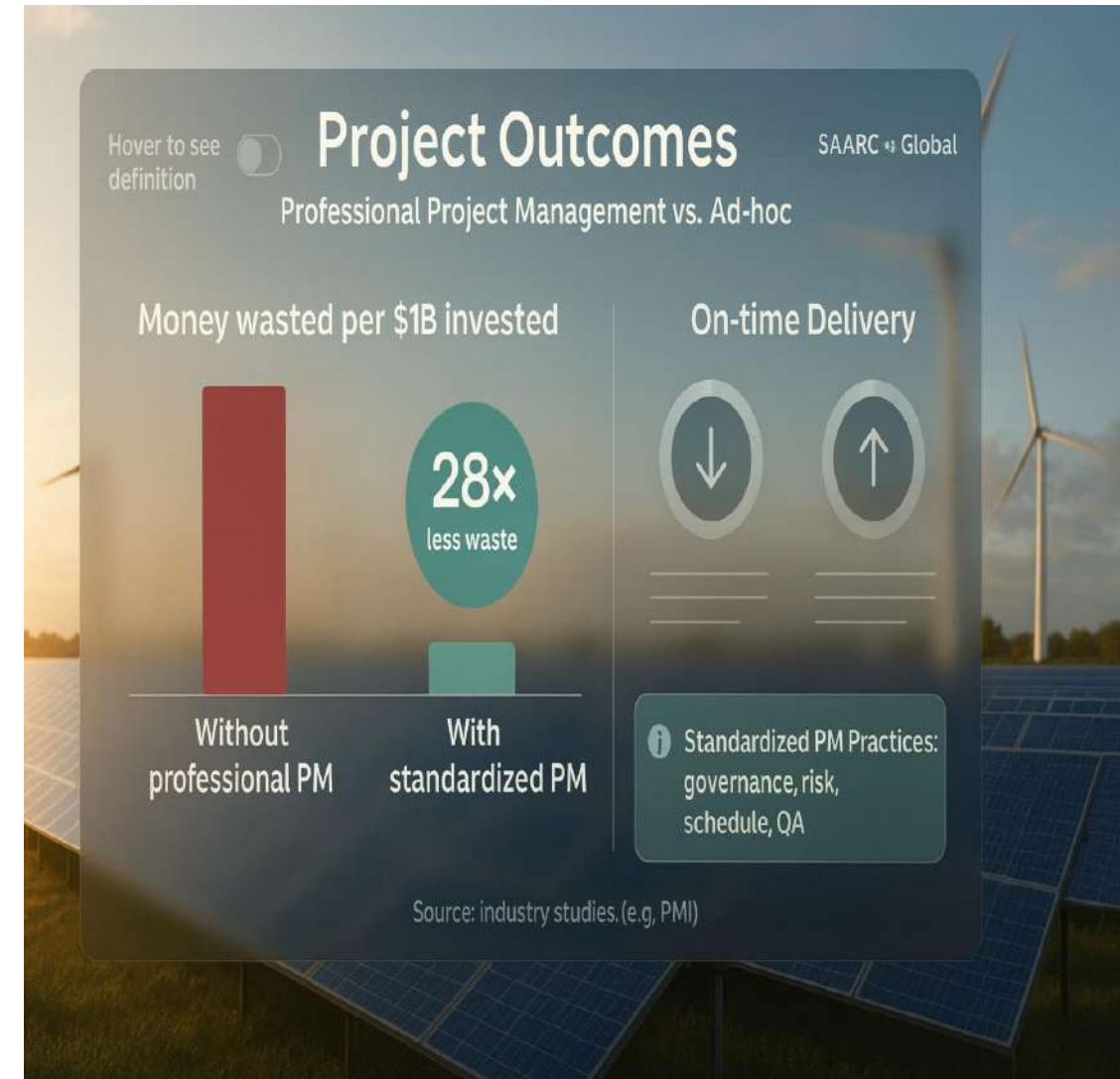
- Ensures technical quality standards are met and compliance with regulations and safety norms, preventing environmental damage or legal issues.

Timely Delivery

- Helps projects stay on schedule.

Scaling Up Efforts

- Enables to manage multiple projects in parallel and achieve strategic targets.



Renewable Energy Landscape & Need for Effective PMC

Global Growth

- RE deployment is accelerating – by 2050, RE could supply ~90% of the world's electricity, underscoring the need for strong project management.

Massive Investment

- Over \$2 trillion investment per year is needed by 2030 in clean energy infrastructure. Effective PMC is critical to ensure effective management and impact.

Rapid Scaling Targets

- Experts project we must install ~455 GW of solar capacity annually through 2030 to meet net-zero goals, which requires streamlined project execution and reduced “soft costs” (permitting, management).

SAARC Regional Context

- The SAARC region has vast renewable potential and is scaling up deployment. Such rapid growth requires effective project management to navigate land acquisition, grid integration, and policy environments.

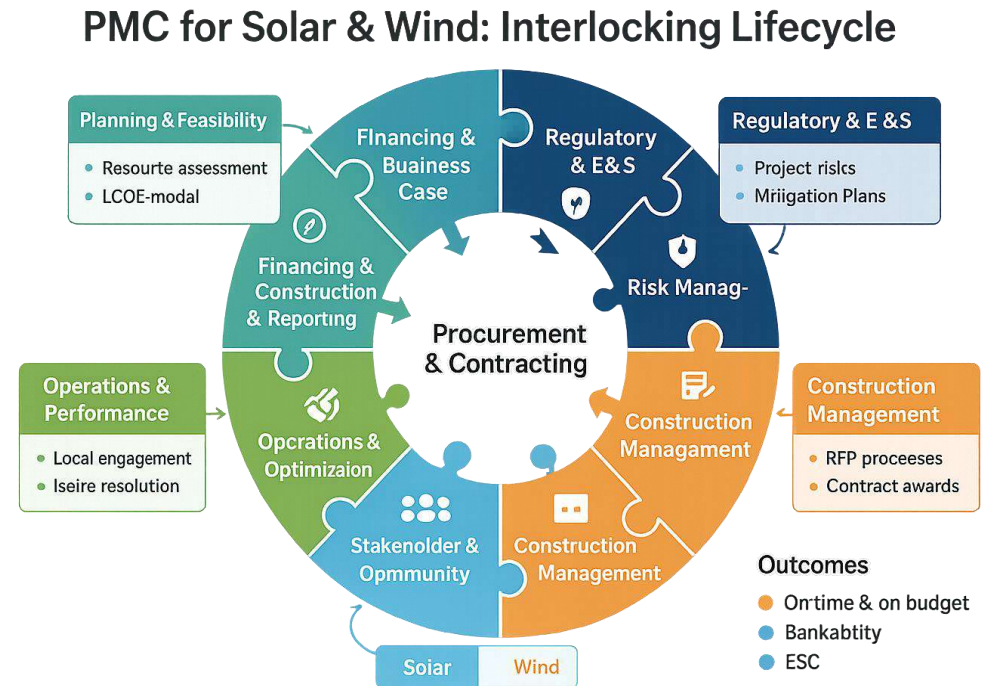
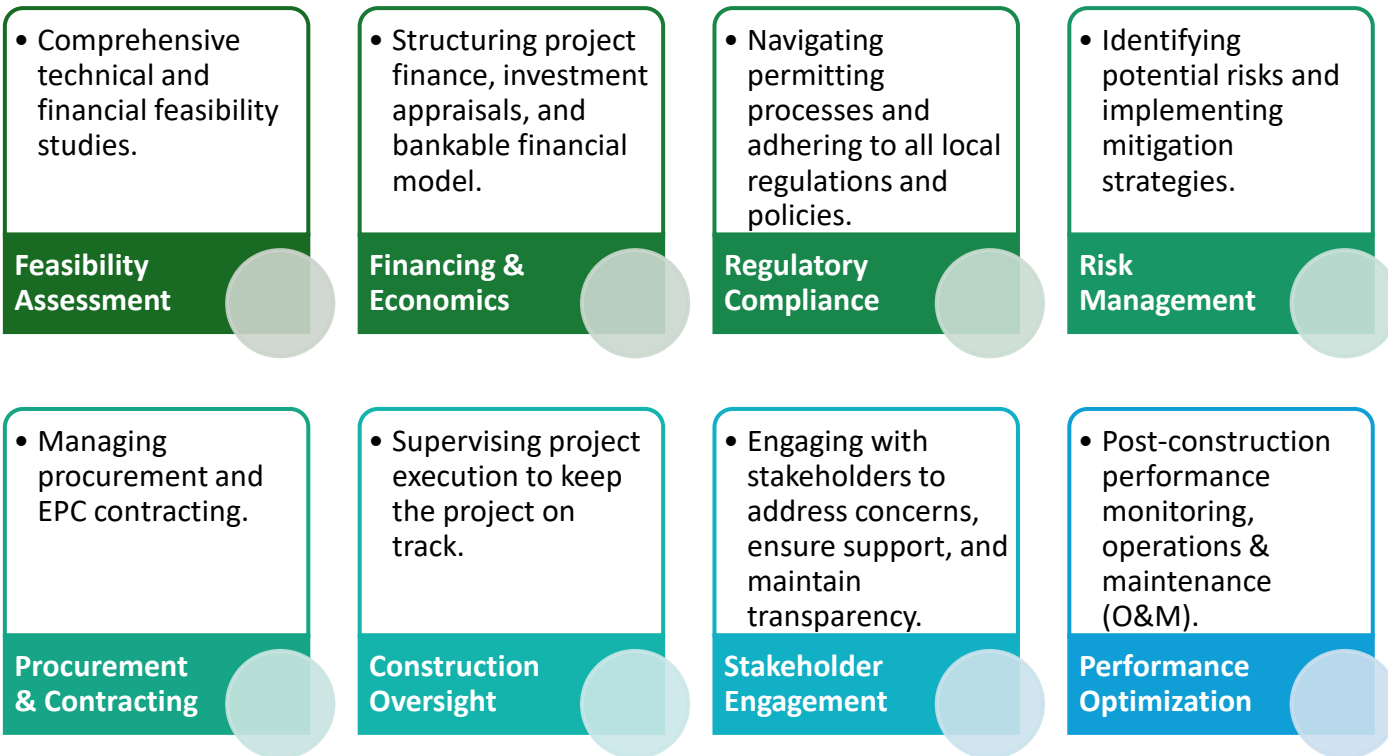
Bridging Gaps

- PMC helps bridge gaps between ambitious goals and on-the-ground execution challenges – ensuring that projects are bankable, socially accepted, and technically sound.

Global Solar & Wind Growth (2010-2025) + South Asia



Key Components of PMC



Feasibility Assessment – Laying the Groundwork

Resource & Site Analysis

Evaluate resource potential at prospective sites for energy output, and assess land availability and grid proximity.

Technical Feasibility Study

Determine optimal technology, plant sizing, and layout. Analyze site conditions to inform design and construction planning.

Economic Viability

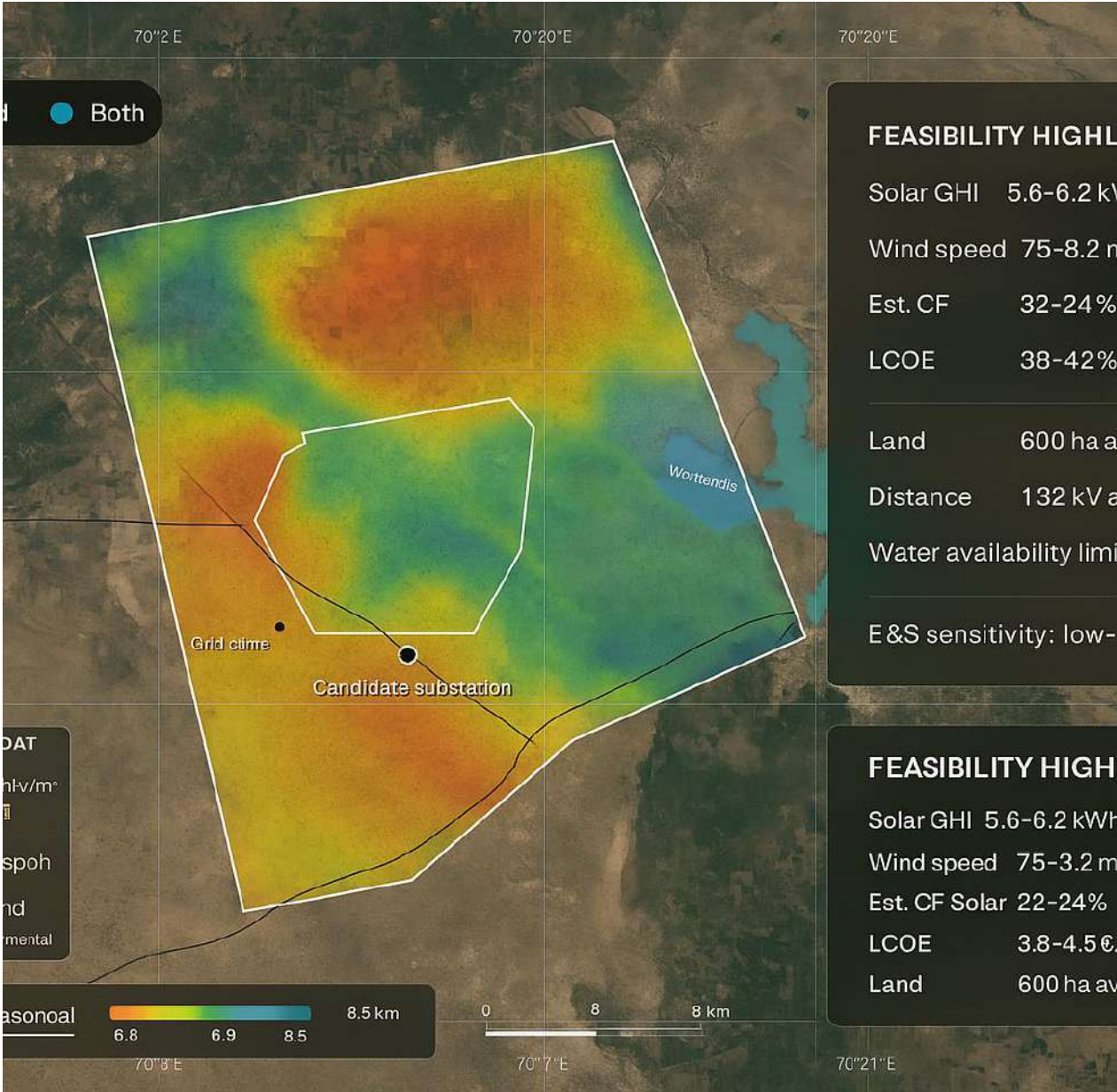
Conduct financial analysis and projected revenues and Calculate IRR, NPV, LCOE.

Permitting & Impact Studies

Identify environmental and social factors early.

Outcome

A bankable feasibility report guiding the decision to proceed.



Financing & Financial Structuring

Capital Requirements

Projects are capital-intensive with high up-front costs. Structured financing Plan– blending equity, debt (project finance loans), and possibly grants or soft loans.

Financial Modeling

Develop detailed project finance models forecasting cash flows over the project life (20–25+ years). Ensure financial metrics (IRR, DSCR, payback) are attractive for investors and lenders.

Securing Investment

Preparing bankable documentation for lenders..

Cost Control Strategies

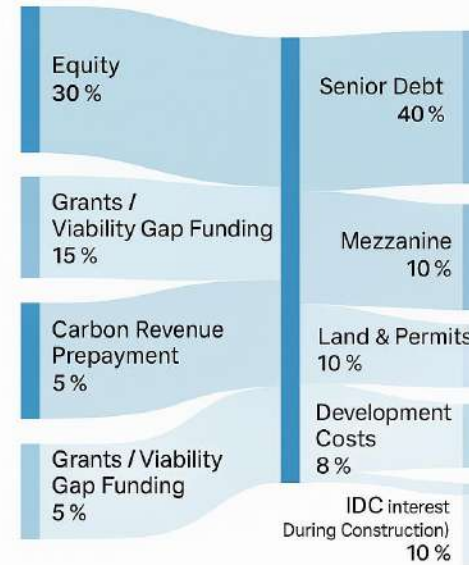
Implement budgeting and cost management practices to prevent overruns. Given tight margins in renewables, cost overruns can jeopardize viability..

Innovative Financing

Leveraging incentives or new models. Credit enhancements or guarantees to attract capital

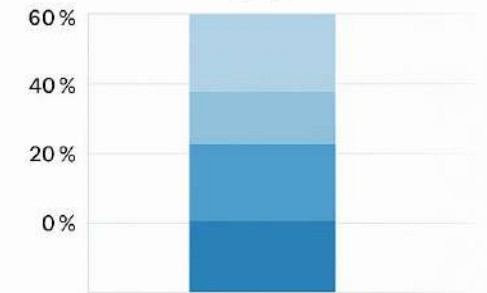
Sources

Download CSV



Uses

DSCR 0,0x WACC 0,0 % IRR 0,0 %



- EPC Modules, Inverters, BoP / Civil
- Grid Tie and Substation
- Land & Permits
- Owner's Engineer / PMC
- IDC (interest During Construction)
- Contingency
- O&M Set-Aside

Regulatory Compliance & Permitting



Solar			
Wind			
Status			
Pending In Inview Approved			
Pre-feasibility	Development	Permitting	Construction Readiness
☐ Environmental & Social Screening	☒ EIA	☒ PA B	☒ Tariff Approval Preview
☐ Site NOC	☐ Land Due Dilligence	☒ Building Permit	☒ H&S Plan Approval
☒ Grid NOC	☒ Interconnection Study	☒ PPP	☒ H&S Plan Approval
☐ Grid NOC	☐ Energy Department Ponsents	☒ PPA	
		☒ Generation License	
0-3 months	6-12 months	6-12 months	Financial Close
Pre-feasibility	6-12 months	6-12 months	COD
☒ Environmental & Social	☒ Land & Site	☒ Construction & Safety	☒ Commercial & Regulatory
☒ Land & Site	☒ Grid & Energy		
☒ Construction & Safety			
Download checklist			
Solar: Wildlife Avian-Bat study, Ins Wildlife-f/Avian-bat.			
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Risk Management – Identifying and Mitigating Risks

Risk Identification

- Identify risks throughout the project lifecycle, i.e., Technical risks, Financial risks, Regulatory risks, Social risks, and Environmental risks.

Risk Analysis

- Assess the likelihood and impact of each risk.

Mitigation Strategies

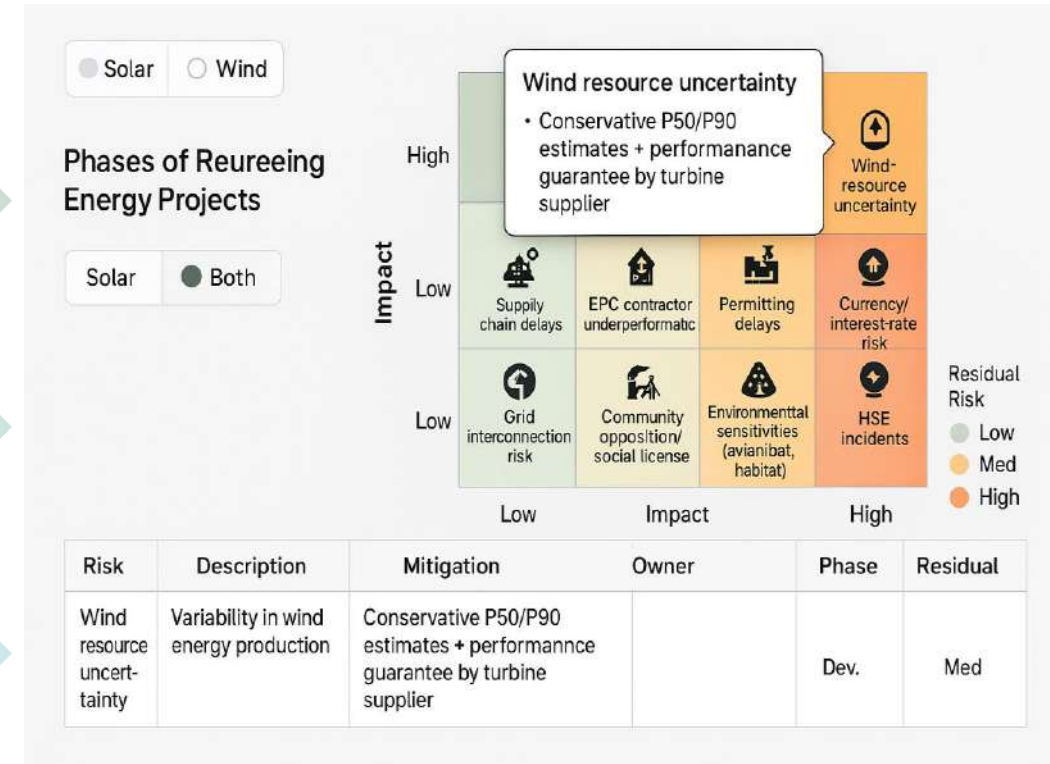
- Develop plans to mitigate high-priority risks; technical solutions, contractual protections, insurance coverage, and financial.

Continuous Monitoring

- Monitor risk indicators throughout execution, deploy corrective actions, and adjust budgets or project scope in consultation with stakeholders.

Value of Risk Management

- Proactive risk management has a direct payoff – it can improve project returns significantly.



Procurement & Contracting

Procurement Strategy

- Develop a procurement plan for major equipment and services.
- Decide on contracting models to balance control and risk.
- Bulk procurement can reduce costs but requires careful management.

RFP and Vendor Evaluation

- Prepare clear RFPs with technical specifications and timelines.
- Evaluate bids.

Contract Negotiation

- Negotiate contracts to protect the project owner's interests. Timely delivery, performance guarantees, liquidated damages for delays or underperformance, and warranty terms; financing terms, etc..

Supply Chain Management

- Manage supply chain and logistics.
- Track manufacturing and shipping schedules for key components to prevent bottlenecks.

Local Content & Compliance

- Compliance with local content requirements or import regulations (if any).

Adaptive Procurement

- Adaptation to the market conditions change.
- Real-time tracking of materials and deliveries.



Solar Wind Both Show critical path

[Download CsV](#)

Supply Chain



Construction Management & Oversight

Project Execution Plan

Develop a detailed project execution plan before construction starts.

On-Site Supervision

During construction, oversee contractors and subcontractors.

Quality inspections ensure that installations meet engineering standards and manufacturers' guidelines.

Schedule & Progress Tracking

Use tools to monitor progress daily/weekly.

Any slippages are identified early.

Keeping the project on its critical path is key.

Issue Resolution

Quickly address on-site issues.

Safety & Compliance

Enforce strict safety protocols and meet all regulatory and lender requirements before commissioning.

Timeline Reality

Renewable projects can have long lead times.

Effective construction management is what turns years of planning into a working project.



Stakeholder Engagement & Social Impact

Mapping Stakeholders

- Identify all stakeholders early and prepare a stakeholder map and engagement plan.

Community Engagement

- Engage local communities transparently to earn a “social license to operate.”

Grievance Redressal

- Establish channels for stakeholders to voice concerns.

Benefit Sharing

- Structure community benefit programs to improve public perception and stakeholder buy-in.

Ongoing Stakeholder Management

- Engagement doesn't stop at commissioning. Post-construction, maintain relations.

Multilateral Projects

- If international financiers are involved, there will be stringent stakeholder and social safeguards to be complied.



Performance Monitoring & Optimization (O&M Phase)

Transition to Operations

- A proper commissioning and handover process is to be managed, including training local operators and transferring all project documentation

Performance Tracking

- Continuously monitor the plant's performance metrics.

Digital Tools for Optimization

- Leverage advanced tools to optimize performance. These technologies allow issues to be detected early.

Maintenance Management

- Develop a preventive maintenance schedule and a Computerized Maintenance Management System (CMMS) to ensure tasks are done on time and track spare parts.

Performance Improvement

- Analyze operational data to identify improvements. Continuous improvement cycles can incrementally boost annual energy production.

KPI Reporting

- Report performance to stakeholders and ensure compliance with any PPA obligations to avoid underperformance.

End-of-Life & Repowering

- Plan for the long term: component replacements, repowering or decommissioning at end-of-life. Early planning ensures compliance and cost-effectiveness.

Photo

100 MW

Challenges Specific to Solar Power Projects

Land Acquisition & Siting

Require vast land areas; acquiring suitable land can be difficult. Balancing land needs with community and environmental considerations.

Intermittency & Grid Integration

Solar generation is intermittent. High solar penetration can cause grid stability issues.

Ensuring grid connectivity and possibly incorporating energy storage or hybrid systems is key.

Grid capacity constraints can delay solar projects if transmission upgrades are needed.

High Initial Costs vs. Declining Prices

While solar panel prices have dropped dramatically, soft costs now make up a large proportion. Reducing soft costs is a major challenge.

Efficiency & Technology

Solar panel efficiency is typically <25% for commercial modules. There's a trade-off between higher-efficiency panels vs. standard ones with more land. Choosing technology impacts cost and output.

Environmental Challenges

Solar farms are relatively low-impact but still face concerns, and might need to address water runoff, fencing, or glare impacting nearby communities.

End-of-life panel disposal/recycling is an emerging concern for sustainability.

Case Example – Land Limitation

Some countries have limited land, which led to creative solutions like floating solar or dual-use (agrivoltaics).

In the SAARC context, densely populated areas may push solar projects to less arable lands or rooftops.

Explore innovative siting to overcome land scarcity.

Area comparison

Illustrative

0

Approx. footprint: 500 acres (200 ha)

Challenges Specific to Wind Power Projects

Site & Resource Constraints

Good wind sites are often in remote areas, lack infrastructure.

Wind resource assessment is critical for project performance.

Grid Infrastructure

Remote windy sites may be far from transmission networks.

Upgrading or building new transmission lines adds cost and complexity.

Grid access is a challenge.

Technical & Construction Challenges

Wind turbines are massive structures. Transportation requires careful logistics.

Installation needs heavy lift cranes and can be delayed by weather.

Offshore wind has even bigger challenges with marine construction and cabling.

Environmental & Social Concerns

Wind projects can face environmental impact issues.

Socially, local communities might raise concerns.

These factors can lead to local opposition..

Operational Intermittency

Wind power is variable.

Sudden drops in wind can lead to rapid power output changes.

Grid operators need to manage this variability.

High wind penetration can require advanced forecasting and grid management tools.

Maintenance in Harsh Conditions

Wind turbines face wear from extreme conditions.

Maintenance work is risky and costly.

Ensuring a strong maintenance is crucial to overcome this challenge.

Example – Jhimpir Wind Corridor (Pakistan)

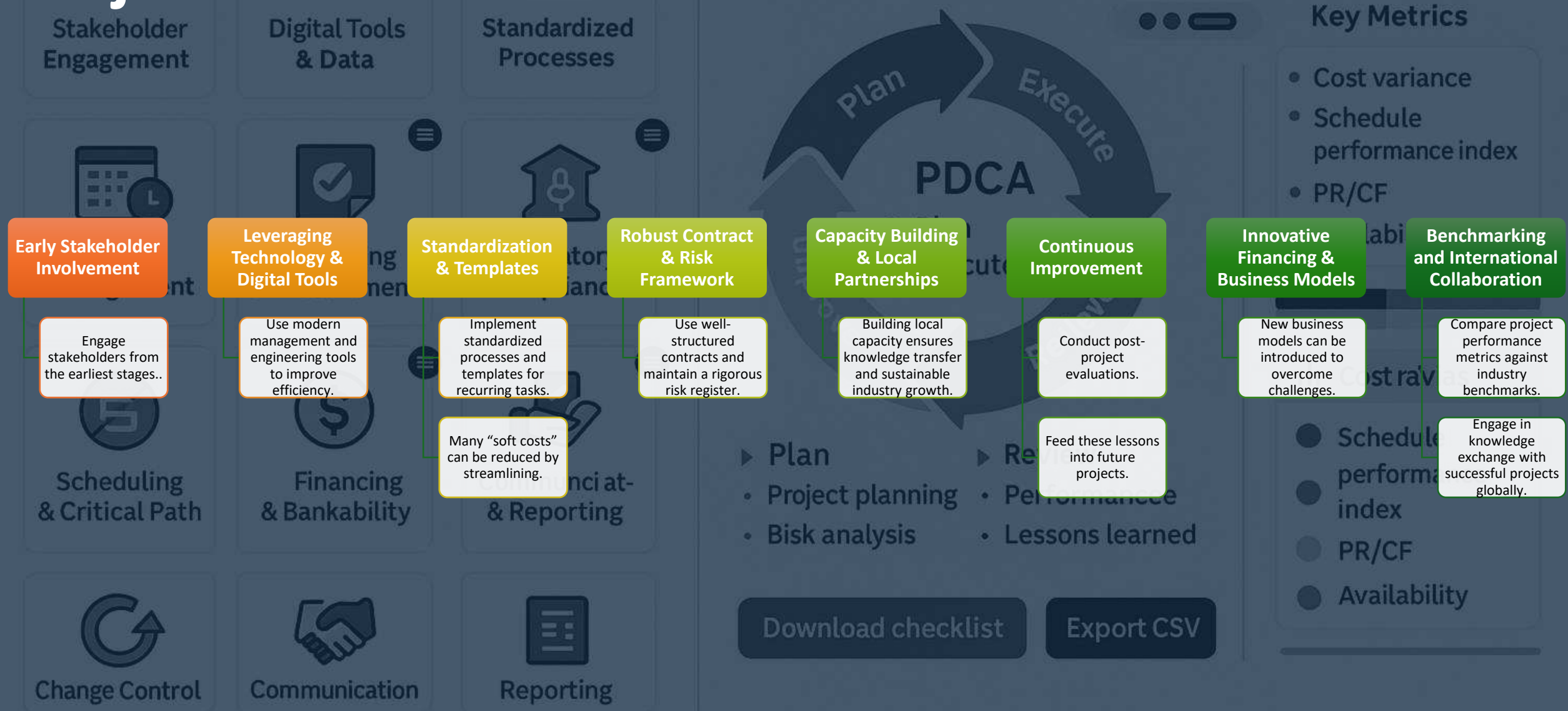
The Gharo-Jhimpir corridor has excellent wind resources

Initial projects required building out grid connections and dealing with a lack of local manufacturing.

Increased government support and international input have helped address these issues,

Further grid upgrades are needed to utilize the wind potential.

Solutions & Best Practices in PMC for Renewable Projects



Global Case Study – Benban Solar Park (Egypt)

Benban Solar Park

Capacity: +1,8 GW_{DC} Area
36 Km²

Irradiance 806 W/m²

Temperature 41°C

Project Overview

- *Benban Solar Park* in Egypt is one of the world's largest solar installations – a 1.8 GW solar PV complex in the Sahara Desert, consisting of 32 contiguous utility-scale projects across 36 km². It's a cornerstone of Egypt's plan to source 20% of its energy from renewables in the mid-2020s.

PMC/Consulting Role

- International consultants (e.g., Wood Plc) were engaged as **Lenders' Technical Advisors** for the project's financiers.
- They performed comprehensive pre-construction due diligence.
- During construction, they provided ongoing monitoring and oversight until the project reached commercial operation.

Key Challenges & Solutions

- The standardized technical requirements and timelines across the 32 projects ensured that grid connection infrastructure was delivered, and shared best practices among developers.
- Environmental challenges of building in a remote desert were managed.

Outcome

- The park was successfully completed in about 3 years from groundbreaking.
- The project stands as a global example of scaling solar energy through effective project structuring and consulting oversight, and it significantly contributes to Egypt's clean energy goals.

Lesson

- Large-scale renewable projects benefit from strong PMC at both the planning and execution stages – to manage complexity, ensure technical robustness, and instill confidence in financiers.
- Benban's success has spurred further renewable investment in the region, much as good project management practices can be replicated in SAARC mega-projects.

Regional Case Study – Wind Energy Projects in SAARC (Pakistan & India)

Pakistan's Wind Corridor (Jhimpir-Gharo)

Pakistan has developed a cluster of wind farms in the Sindh province's wind corridor.

A global consultancy was appointed as the **Owner's Engineer**.

This project successfully achieved grid connection, becoming one of Pakistan's first IFC-financed wind IPPs in operation.

Impact

Pakistan's wind capacity grew from zero in 2009 to ~1.8 GW by 2025.

However, challenges remain (grid constraints and policy issues, as noted earlier).

The lesson is that having strong project management and technical advisors helped de-risk early projects and establish wind power credibility in Pakistan, paving the way for scale-up.

India's Solar Park Program

India solar parks Case: **Bhadla Solar Park** in Rajasthan – 2,245 MW capacity.

A dedicated government agency managed land acquisition and permitting, and multiple developers built projects within the park.

PMC aspects included.

This model greatly reduced soft costs and development timelines.

Additionally, India set up ~70 solar park zones nationwide to streamline project development.

The result is a massive rollout of solar – over 119 GW installed by 2025 – achieved by replicating best practices.

Key Takeaway

In the SAARC region, both examples show that tailored project management approaches – whether through engaging experienced consultants or institutionalized program management – have been instrumental in delivering renewable projects at scale.

These case studies provide models for other countries in the region to follow, combining international expertise with local execution to achieve their clean energy ambitions.

Conclusion & Way Forward

Comprehensive Approach

PMC is a **holistic discipline** that ensures projects are completed successfully.

From initial feasibility to operational optimization, PMC adds value at every step.

Key Benefits Recap

Effective PMC helps harness local resources, reduce costs, mitigate risks, and ensure compliance.

It aligns projects with national goals while keeping stakeholders satisfied.

Empowering the SAARC Region

By leveraging global best practices and regional cooperation, we can overcome challenges.

Strengthening local capacities will be key to scaling solar and wind power.

Future Outlook

The role of professional project management will grow.

Embracing digital transformation could further enhance efficiency.

Final Thought

Successful RE deployment is not just about technology or finance – it's about execution.

With diligent PMC, we can deliver projects on time, on budget, and at the quality.

The benefits are fully realized for our communities.

Q&A

*Thank you for your
attention.*

We now welcome
questions and
discussion.

Together, let's drive
the renewable energy
future with effective
project management.