



Best Practices in Implementation of the Planned Transmission System

Online Knowledge Sharing Workshop

Bhutan Power Corporation Limited (BPC)

Thimphu: BHUTAN



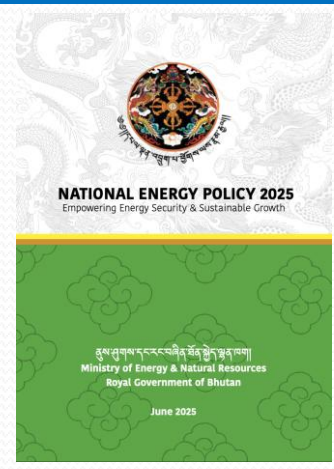
Overview

- **Key Institutions & Roles**
- **Overall Planning for Transmission System**
- **Why Transmission Line Projects Are Challenging**
- **Response Framework:**
- **Practical Lessons for BIMSTEC Member States**

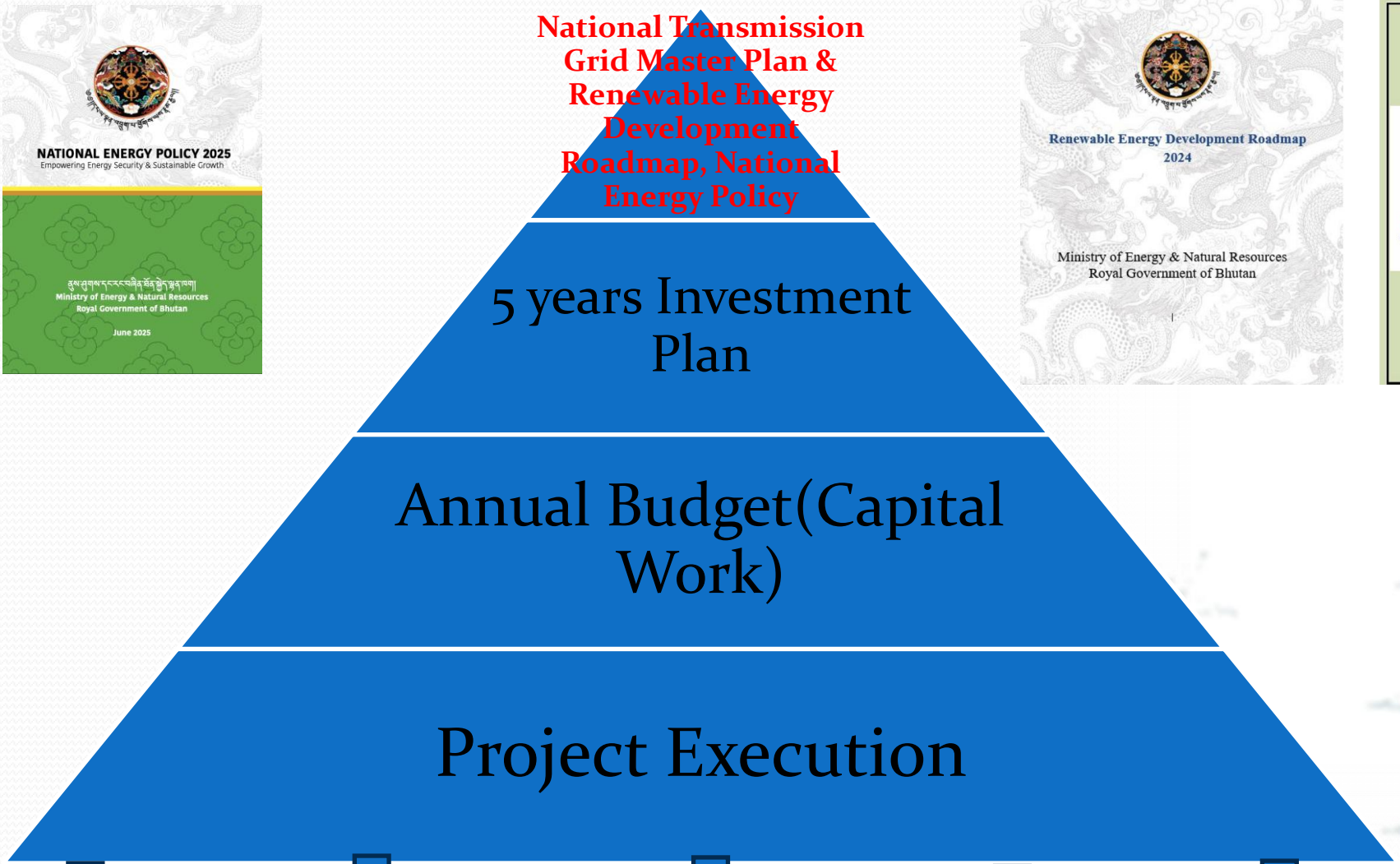
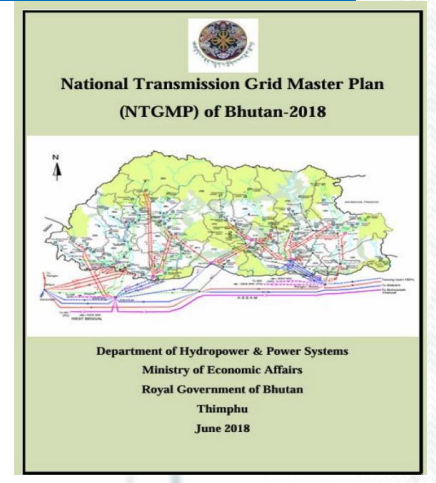
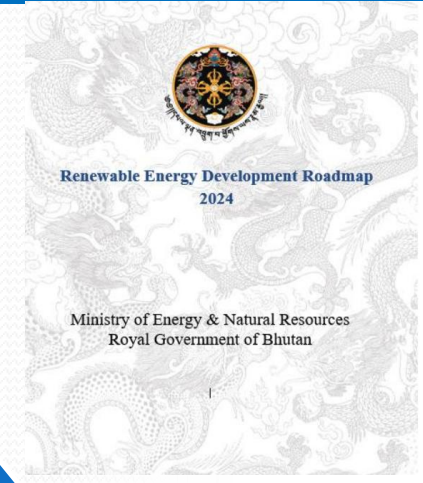




Overall Planning for Transmission System



National Transmission Grid Master Plan & Renewable Energy Development Roadmap, National Energy Policy





Why Transmission Line Projects Are Challenging

- **Right of Way** acquisition across private, community and government lands can delay project commencement.
- Projects require **multiple approvals** from landowners, communities, forest authorities, local government and environmental regulators.
- Bhutan has **limited skilled workforce** availability, leading to dependence on foreign skilled labour.
- **Mountainous terrain**, dense subtropical vegetation and inaccessible tower locations make surveys, foundations, erection and stringing difficult.
- **Long manufacturing lead times**, difficult material transport and exposure to landslides, floods, GLOF and seismic risk complicate delivery.
- **Vendor participation is limited** and
- **Labour or immigration regulations** add further implementation constraints.



Response Framework: Best Practices Adopted

An integrated approach spanning engineering, planning, execution and capability building

Engineering &
Technology

Survey &
Planning

Construction &
Project Management

Institutional &
Digital Systems

"Combine technical innovation with proactive approvals, disciplined delivery and organizational readiness"

Engineering and Technology Innovations

Key practices

- ❖ Climate-resilient tower design to withstand extreme weather and seismic risk.
- ❖ Drone use for route surveys, detailed mapping and support to line stringing.
- ❖ Helicopter services for transporting materials and equipment to inaccessible tower locations.
- ❖ Regular design coordination meetings to speed up review and approval of drawings.

Why it matters

- ❖ Improves safety and accessibility in difficult terrain.
- ❖ Reduces mobilization time in remote sites.
- ❖ Cuts approval bottlenecks and helps maintain schedule momentum.
- ❖ Strengthens technical resilience against climate and disaster exposure.



Survey, Routing and Stakeholder Coordination

Planning practices

- ❖ Use experienced survey teams with local participation to detect constraints early.
- ❖ Apply GIS-based desktop studies covering private land, heritage sites, parks, biological corridors, roads, water resources and land use.
- ❖ Use high-precision RTK GNSS equipment for accurate route alignment and tower spotting.
- ❖ Develop SOPs and checklists for feasibility surveys and Initial Environmental Examinations.
- ❖ Keep all stakeholders in loop

Coordination practices

- ❖ Coordinate proactively with forest authorities, Gewog and Dzongkhag administrations and local communities.
- ❖ Avoid ecologically, socially, culturally and religiously sensitive areas where possible.
- ❖ Reduce environmental and social impacts through informed route selection.
- ❖ Build acceptance early and minimize rework during implementation.



Construction and Project Management Measures

- ❖ Maintain spare stubs and O&M spare components to reduce downtime and construction lag.
- ❖ Carry out regular site monitoring, progress review and reporting for early risk identification and management.
- ❖ Ensure timely payments to contractors and suppliers to sustain performance and uninterrupted execution.
- ❖ Use disciplined monitoring and decision-making to keep urgent national projects on track despite field constraints.
- ❖ Dashboard Monitoring by top management

Execution priorities

- Schedule reliability
- Contractor confidence
- Faster issue escalation
- Less idle time onsite



Capacity Building, Governance and Digital Transformation

People and governance

- ❖ Continuous training, mentoring and coaching on technical, ethical and project objectives at all levels.
- ❖ Institutional strengthening through PMP, MCIPS, ISO standards and sustainability investigation certification (ESG).
- ❖ Use centres of excellence to reinforce professionalism, consistency and accountability.
- ❖ Delegation of power to project
- ❖ Ethics & Integrity

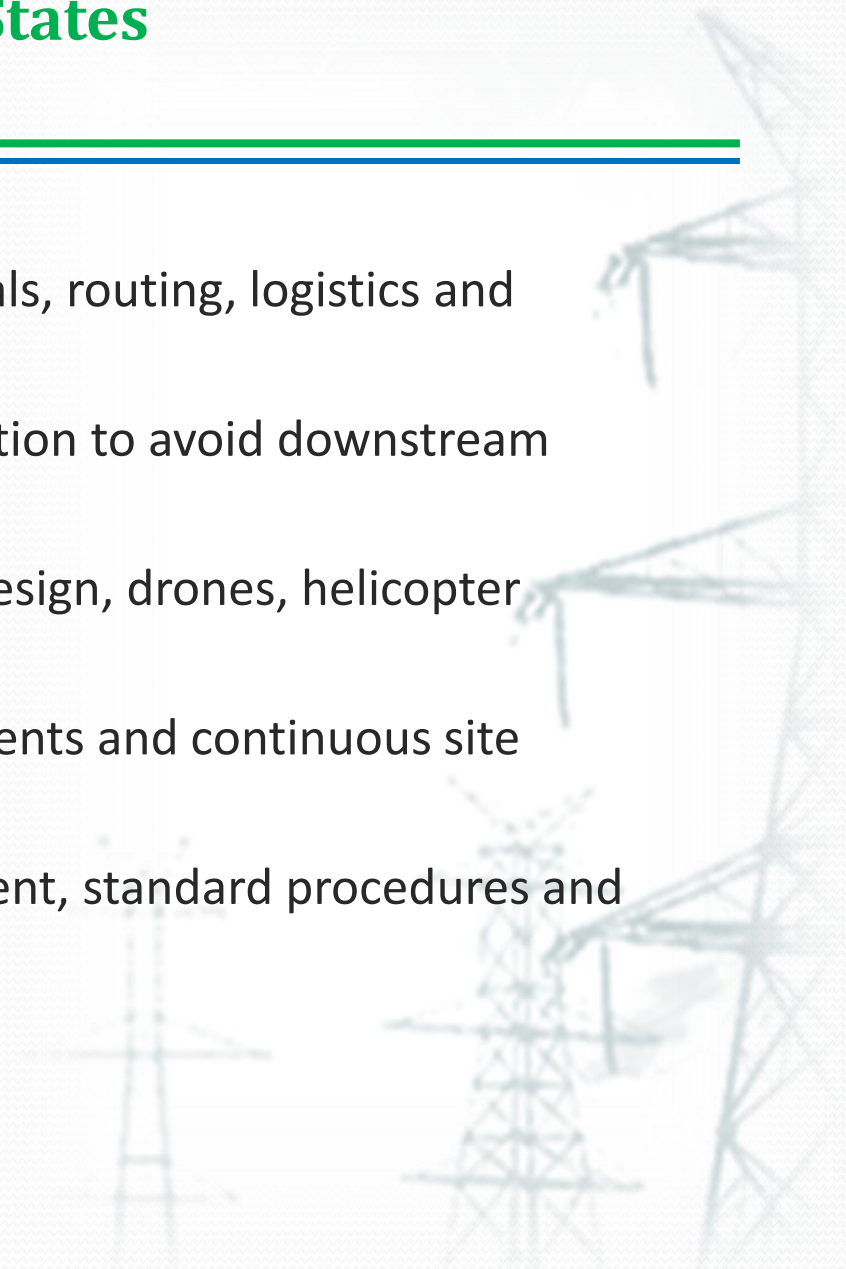
Enterprise systems

- ❖ SAP Ariba supports digital tendering and contract administration for transparency and efficiency.
- ❖ RISE with SAP supports material tracking, inventory management and supply chain coordination.
- ❖ Digital systems improve visibility, control and execution efficiency across the project lifecycle.



Practical Lessons for BIMSTEC Member States

- ✓ Treat transmission projects as cross-sector programmes: approvals, routing, logistics and community engagement must move in parallel.
- ✓ Invest early in survey quality, GIS intelligence and route optimization to avoid downstream delays.
- ✓ Match difficult terrain with the right technology mix—resilient design, drones, helicopter logistics and precision survey tools.
- ✓ Keep contractors enabled through timely decisions, timely payments and continuous site monitoring.
- ✓ Strengthen implementation institutions through skills development, standard procedures and digital systems.
- ✓ Build strong Ethics, Integrity & Trust amongs the team



Tashi Delek!

“Panned transmission systems succeed when engineering innovation, proactive stakeholder management and disciplined execution work together”



**in every
CHALLENGE
lives a greater
OPPORTUNITY.**