

Terms of Reference (ToR)

Position Title /Level : Chief Engineer (Civil/Electrical/Mechanical)
Employer : Energy Resources and Development Division (ERDD), Department of Energy
Work Station : Ministry of Energy and Natural Resources, Thimphu
Reporting To : Director General, Department of Energy, MoENR
Supervises : Engineers, technical professionals and other personnel assigned to the Division

1. Background

The Energy Resource Development Division (ERDD) is a technical division under the Department of Energy (DoE), Ministry of Energy and Natural Resources (MoENR). The Division is responsible for the assessment, planning and development of Bhutan's renewable energy resources, with particular focus on hydropower and utility-scale renewable energy projects.

ERDD provides technical leadership across the renewable energy development value chain, including resource assessment, project identification and prioritisation, reconnaissance and pre-feasibility studies, feasibility studies, Detailed Project Reports (DPRs), technical appraisal and clearance, procurement and tendering support and technical aspects of project implementation and contract management.

ERDD brings together multidisciplinary technical expertise covering hydrology and hydropower planning, geology and geotechnical engineering, civil and structural engineering, electro-mechanical and hydro-mechanical systems, solar and other renewable energy technologies, resource assessment, GIS and spatial analysis, engineering modeling and data analytics.

The Division also contributes to the development, review and updating of technical guidelines, standards, manuals, codes, procedures and institutional systems required to ensure that renewable energy projects are developed to high standards of technical integrity, economic viability, environmental and social responsibility, resilience and long-term sustainability.

2. Position Details

The Chief Engineer shall provide strategic, technical and managerial leadership to the ERDD and shall be accountable for ensuring that Bhutan's renewable energy resources are assessed, planned and developed in a systematic, technically robust, economically viable, environmentally and socially responsible, climate resilient and sustainable manner.

The position shall lead the translation of national energy policies, master plans, roadmaps, strategies and development priorities into a coherent renewable energy resource development programme and a technically credible project pipeline.

Responsible for leading the Division in translating national energy policies, master plans, roadmaps and strategic plans into viable renewable energy development programs and projects.

The Chief Engineer shall provide independent and authoritative technical oversight throughout the project development cycle and ensure that major renewable energy projects are subjected to rigorous and transparent assessment before and after progressing to subsequent stages of development.

The position shall also lead the continuous modernization of renewable energy planning and engineering practices through the application of advanced modeling, digital technologies, GIS, remote sensing, data analytics, AI and other appropriate tools, while strengthening national technical capability and institutional knowledge.

The Chief Engineer shall serve as a key authority within the Department on renewable energy resource development and shall provide evidence-based advice to senior management, the Ministry and competent authorities on strategic choices, project priorities, technical risks, investment readiness and long-term resource development.

3. Duties, Responsibilities and Accountabilities

3.1 Strategic Renewable Energy Resource Planning

1. Lead the assessment, planning and development of renewable energy resources in accordance with Master Plans, Roadmaps, Strategic Plans and other national programs.
2. Translate national renewable energy priorities into resource development programmes, project pipelines, investment priorities and implementation strategies.
3. Periodically review and optimise the national renewable energy project pipeline based on resource potential, technical feasibility, economic viability, environmental and social considerations, climate resilience, system requirements, implementation readiness and national development priorities.
4. Provide strategic technical advice to the Department, Ministry and competent authorities on the optimal and sustainable utilization of renewable energy resources.

5. Identify opportunities for diversification of the renewable energy portfolio, including hydropower, utility-scale solar, wind and other emerging or alternative renewable energy technologies.
6. In coordination with other divisions under the Department, assess the long-term implications of technology development, electricity demand, energy markets, grid development, storage, energy system integration and regional power trade on renewable energy resource planning.
7. Promote a portfolio based approach to renewable energy development that balances resource potential, project risk, economic returns, energy security, system flexibility and long term national interests.

3.2 Resource Assessment and Technical Investigation

8. Lead and oversee reconnaissance, pre-feasibility and other preliminary investigations for hydropower and other utility-scale renewable energy projects.
9. Ensure systematic and scientifically robust assessment of renewable energy resources using field investigations, engineering surveys, monitoring systems, remote sensing, GIS, modelling, data analytics and other appropriate technologies.
10. Guide hydrological assessments, water resource studies, hydrological modelling, flow estimation, flood analysis, power potential assessment, optimization studies and reservoir simulations for hydropower development.
11. Oversee geological and geo-technical investigations, including geological modelling, rock mechanics, geological hazard assessment, slope stability. Seismic considerations and site suitability assessment.
12. Ensure that technical investigations adequately identify and address environmental, social, climate and disaster related risks from the earliest stages of project development.
13. Oversee GIS-based spatial and temporal analysis for resource mapping, site identification, technical investigation, infrastructure planning and renewable energy development.
14. Establish and maintain reliable renewable energy resource data, monitoring systems and information databases to support evidence-based planning and decision-making.

15. Ensure appropriate quality assurance and quality control of resource data, surveys, investigations, models and technical analysis used for project development and decision-making.

3.3 Project Development and Technical Assurance

16. Lead and facilitate the preparation, commissioning, review or undertaking of Detailed Project Reports (DPRs), Feasibility Study Reports (FSRs) and other technical studies for utility-scale renewable energy projects.
17. Establish and maintain a robust technical assurance framework covering the full project development cycle.
18. Ensure that DPRs, FSRs and supporting technical studies meet applicable national requirements, prescribed standards and internationally accepted engineering practices.
19. Lead multidisciplinary technical review and appraisal of project studies, designs and development proposals.
20. Review and validate key engineering assumptions, design parameters, energy estimates, hydrological and resource assessments, project configurations, construction methodologies, cost estimates, project configurations and implementation schedules.
21. Guide the application of advanced engineering software, modelling tools and digital technologies in project planning, design and optimization.
22. Ensure appropriate integration of socio-environmental considerations into project feasibility and development decisions.
23. Identify technical, financial, environmental, social, climate, procurement, implementation and operational risks and ensure that appropriate mitigation measures are incorporated into project planning.
24. Ensure appropriate integration of environmental and social considerations into project feasibility, design, prioritization and development decisions.
25. Promote value engineering, design optimization, life-cycle cost assessment and cost effectiveness throughout project development.

3.4 Technical Clearance and Appraisal

26. Lead the technical appraisal and vetting of DPRs, FSRs and other major renewable energy projects within the authority delegated to the Department.
27. Lead the process for Technical Clearance/Technical Sanction of DPRs/FSRs of renewable energy projects in accordance with applicable laws, regulations, policies, standards and guidelines.
28. Provide independent, evidence-based recommendations to the competent authority regarding the approval, modification, further investigation, deferment or rejection of project proposals.
29. Ensure that technical clearance decisions are supported by adequate evidence, documented assumptions, transparent evaluation criteria and clearly identified risks and conditions.
30. Ensure appropriate technical review and peer-review mechanisms for major or technically complex projects.
31. Ensure that lessons learned from completed studies and projects are systematically captured and incorporated into subsequent project development and technical standards.

3.5 Standards, Guidelines and Regulatory Frameworks

32. Lead the development, review and periodic updating of renewable energy development guidelines, technical standards, manuals, codes, procedures and technical protocols.
33. Ensure consistency of renewable energy project development with applicable national policies, regulations, guidelines, standards and statutory requirements.
34. Benchmark national technical requirements against international standards and good engineering practices and recommend appropriate adaptation to Bhutanese conditions.
35. Identify gaps, inconsistencies and emerging requirements within the technical and regulatory framework and recommend improvements to the competent authorities.
36. Promote consistency, transparency and predictability in the application of technical requirements across renewable energy projects.

37. Provide technical guidance to project developers, consultants, utilities, contractors and implementing agencies on the interpretation and application of applicable standards and requirements.

3.6 Procurement, Tendering and Contract Technical Management

38. Lead or oversee the technical aspects of bidding and tendering processes for renewable energy projects in accordance with applicable government procurement rules, procedures and contractual requirements.
39. Ensure that technical specifications, employer's requirements, scope of work, evaluation criteria and other procurement documents are technically sound, complete and fit for purpose.
40. Provide technical oversight during bid evaluation and support objective assessment of technical proposals in accordance with approved evaluation criteria.
41. Oversee technical aspects of contract management for renewable energy projects.
42. Monitor contractor and consultant performance against approved designs, technical specifications, contractual requirements, schedules, quality standards and agreed deliverables.
43. Identify, assess and advise on significant technical variations, claims, design changes, delays, defects and other technical matters arising during project implementation.
44. Ensure that technical decisions during implementation are properly documented, justified and consistent with approved project objectives and contractual provisions.

3.7 Innovation, Digitalization and Emerging Technologies

45. Lead the adoption of modern engineering tools and digital technologies for renewable energy resource assessment, planning, design, appraisal and project management.
46. Promote the application of advanced modelling, simulation, optimisation, remote sensing, GIS, digital platforms, data analytics and AI where technically appropriate and demonstrably beneficial.
47. Assess the technical and economic applicability of emerging and alternate renewable energy technologies and solutions under national conditions.

48. Promote innovation in renewable energy development, including improved resource forecasting, energy system modeling, storage solutions, hybrid renewable energy systems and other technologies that enhance system reliability, flexibility and resilience.
49. Promote appropriate digital systems for the management, integration validation and sharing of renewable energy resources and project data.
50. Ensure that increasing reliance on digital systems and data-driven decision-making is supported by appropriate standards for data quality, information security, system resilience and cybersecurity.

3.8 Institutional Capacity and Professional Development

51. Lead the development and implementation of capacity-building programmes to strengthen national expertise in renewable energy technologies, engineering, modelling, project appraisals and modern energy systems.
52. Coach, mentor and develop engineers and technical staff to build a strong, competent and future-ready national renewable energy workforce.
53. Promote knowledge transfer from consultants, developers, contractors and international technical partners to national professionals.
54. Establish mechanisms for knowledge management, technical documentation, lessons learned and institutional retention of expertise.
55. Encourage professional development, continuous learning, innovation and adherence to high standards of professional engineering practice within the division.

3.9 Leadership, Coordination and Stakeholder Management

56. Provide effective leadership and direction to the ERDD and ensure efficient allocation of technical, human and financial resources.
57. Establish clear priorities, work programmes, performance expectations and quality standards for the Division.
58. Ensure effective coordination among multidisciplinary technical teams and promote integrated decision-making across hydrology, geology, geotechnical, civil, structural,

electro-mechanical, hydro-mechanical, renewable energy technology, GIS and other relevant disciplines.

59. Coordinate with relevant divisions of the Department, government agencies, utilities, project developers, consultants, contractors, financing institutions, research institutions and other stakeholders on matters relating to renewable energy resource development.
60. Represent the department in technical committees, inter-agency forums, professional platforms and national or international engagements relating to renewable energy development.
61. Build effective professional relationships with national and international institutions to facilitate knowledge exchange, technology transfer, technical cooperation and access to international good practices.
62. Provide timely and authoritative technical advice to senior management and the Ministry on critical project, policy and resource development matters.

3.10 Governance, Risk and Performance Accountability

63. Establish and maintain robust technical governance and quality assurance systems within the division.
64. Ensure that major technical decisions are based on reliable evidence, sound engineering judgment, documented analysis and appropriate peer review.
65. Maintain an effective risk management framework covering resources, technical, financial, environmental, social, climate, procurement, implementation and operational risks.
66. Monitor the performance of the renewable energy pipeline and provide periodic assessments of project readiness, risks, constraints and required interventions.
67. Ensure timely escalation of material technical risks, deviations and emerging issues to the appropriate level of authority.
68. Promote a culture of professional integrity, accountability, transparency, safety, continuous improvement and evidence-based decision-making.

69. Ensure that the division's programmes and activities are delivered efficiently, within approved resources and in accordance with applicable government systems and requirements.
70. Establish appropriate performance indicators and reporting mechanisms to monitor the effectiveness, quality and impact of the division's work.

4. Minimum Qualification/Experience

Qualification:

Bachelor's degree in Engineering (Civil/Electrical/Mechanical), or a related field from a recognized university.

Experience:

Currently serving at **P2 level** and having completed a minimum of two years of active service in the current Position Level at the time of the promotion effective date.

5. Amendment

The above responsibilities shall be reviewed and amended from time to time by the agency.

"End of Document – Terms of Reference"