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TERMS OF REFERENCE

International Consultant – Cold Chain Systems Strengthening and Optimisation

CONTRACT MODALITY	Individual Consultancy
DUTY STATION	**Port Moresby, Papua New Guinea (office based)**
DURATION OF CONTRACT	**12 months**

Purpose of Assignment

Papua New Guinea (PNG) faces significant geographical, infrastructural and operational challenges in maintaining an effective immunization cold chain system, particularly in remote and hard-to-reach areas. Limited technical capacity, unreliable power supply, inadequate maintenance systems and logistical constraints continue to affect the functionality and sustainability of cold chain equipment (CCE), posing risks to vaccine quality and immunization service delivery.

UNICEF, in collaboration with the National Department of Health (NDoH) and development partners, has made substantial investments in cold chain infrastructure in recent years, including equipment procurement and deployment of 496 SDD Refrigerators, rehabilitation of vaccine storage facilities, solar-powered refrigeration, temperature monitoring and capacity building. However, outstanding equipment installations, maintenance backlogs, gaps in technical expertise and incomplete equipment inventory data require continued specialized technical support.

There is a critical need to strengthen national cold chain maintenance systems, establish sustainable technical training arrangements, advance solarization initiatives and institutionalize the Cold Chain Equipment Tracking System (CCETS). Furthermore, an updated national cold chain inventory and comprehensive capacity gap analysis are essential to guide equipment deployment, prioritize investments and inform evidence-based Gavi funding proposals. To address these priorities, UNICEF PNG seeks to engage an International Cold Chain Consultant for 12 months to provide specialized technical assistance to the NDoH.

The consultancy will focus on completing outstanding installations, strengthening maintenance and monitoring systems, developing national technical capacity, improving inventory management and supporting sustainable cold chain investments, and providing support in expanding and monitoring solar photovoltaic systems.

The consultancy will contribute to a reliable, efficient and sustainable national cold chain system while strengthening NDoH institutional capacity, safeguarding vaccine quality and improving immunization service delivery across Papua New Guinea.

Duration: 12 months. The consultancy is output-based and supports national capacity transfer.

Scope of Work

The consultant will work under the supervision of the UNICEF Immunisation Specialist in close collaboration with NDoH, provincial health authorities and partners. The assignment comprises the following time-bound technical workstreams:

1. **Cold Chain Equipment Installation:** Ensure the timely installation, commissioning and operational verification of 100 VLS 056 RF solar direct-drive (SDD) refrigerators across designated health facilities in various provinces of Papua New Guinea.

2. **National Cold Chain Training Centre:** Support the establishment and operationalization of a National Cold Chain Training Centre in Papua New Guinea, including the development of a national cold chain training curriculum, finalization of the procurement of technician tools and equipment, and preparation of a costed establishment and operationalization plan. Coordinate the training of at least two cohorts of 20 participants each, in collaboration with the Health Facility Standards Branch (HFSB) and the National Cold Chain and Vaccine Management Resource Centre (NCCVMRC), India.

3. **Solarization and Photovoltaic Systems:** Conduct solar photovoltaic system assessments at prioritized vaccine storage facilities using the standard global assessment template. Develop and analyze electrical load profiles in close collaboration with the Centre of Excellence to determine appropriate solar photovoltaic system requirements, technical specifications and capacity needs for sustainable vaccine storage operations. Provide regular updates on the functionality status of the 20 existing solar photovoltaic installations, highlighting achievements, outstanding activities, implementation challenges and recommended corrective actions.

4. Inventory and capacity gap analysis: In liaison with the PCCLOs and PFHSC, review and update the CCE inventory and usable storage capacity at all levels, incorporating equipment condition, power source, programme demand and expansion and replacement priorities.

5. **CCETS strengthening and rollout:** Review pilot issues, user roles, service-level agreements and maintenance workflows; support system improvements, provincial rollout, data validation, dashboards and user training.

6. **Maintenance costing and implementation:** Prepare preventive and corrective maintenance strategy, service arrangements, spare parts and annual budgets; support priority repairs and document restored functionality.

7. **Cold chain monitoring and improvement:** Establish the strategy to ensure temperature is continuously monitored at all levels, develop SOPs, indicators and corrective actions and document performance improvements.

8. **Gavi proposal support:** Conduct a comprehensive cold chain equipment inventory and capacity gap analysis using the standard Gavi template. Identify and prioritize cold chain investment needs, develop costed investment plans, prepare technical specifications and justifications, and compile a comprehensive Gavi cold chain investment proposal package to support sustainable immunization supply chain strengthening in Papua New Guinea.

Work Assignments Overview	**Deliverables/Outputs**	**Delivery deadline to complete the deliverable**
Inception Report A comprehensive inception report outlining the consultancy methodology, detailed workplan, implementation timelines, key activities, expected outputs, stakeholder coordination arrangements, identified priorities, potential risks and mitigation measures, and a monitoring framework for tracking progress against agreed deliverables over the 12-month	**Deliverable 1** – Inception report	31/01/2027

consultancy period.		
National training centre	**Deliverable 2** – Costed training centre establishment and operationalization plan; technician toolkit and relevant procurements done.	28/02/2027
Maintenance system and implementation	**Deliverable 3** – Costed national preventive/corrective maintenance plan, spare-parts requirements, implementation records and functionality restoration results	31/03/2027
CCE installation and commissioning	**Deliverable 4 –** Installation, verification and commissioning reports for up to 100 VLS 056 RF SDD units, with signed handover and outstanding exceptions register.	30/04/2027
Technician training	**Deliverable 5 –** Two- Cohorts of 20 technicians each trained in refrigeration and vaccine management.	30/05/2027
Solar PV feasibility and implementation	**Deliverable 6 –** Solar PV assessment in 3 PVS and propose the PV size for the PVS in liaison with Centre of Excellency. Functional update of the existing 20 solar PV system	30/06/2027
National inventory and capacity gap analysis as part of Gavi cold chain investment package	**Deliverable 7 –** Updated national CCE inventory, capacity gap analysis and prioritised costed investment plan.	30/07/2027
Ensuring maintenance of reliable cold chain network for vaccine storage including installation of Remote Temperature Monitoring Devices (RTMDs) and associated data management	**Deliverable 8 –** A comprehensive report documenting the installation and operational status of Remote Temperature Monitoring Devices (RTMDs), temperature monitoring performance, data management,	31/08/2027

	and corrective actions undertaken to ensure reliable and uninterrupted vaccine storage across the cold chain network. Preventive maintenance report for 8 AMS WICR and 2 Freezer Rooms	
CCETS strengthening and rollout	**Deliverable 9 –** A comprehensive report documenting the strengthening and rollout of the Cold Chain Equipment Tracking System (CCETS), including three online user training and capacity building with the PHA personnel to ensure functionality improvements, updating and validation of cold chain equipment inventory data, provincial rollout progress, equipment maintenance tracking, data quality assurance, and recommendations for sustainable nationwide implementation and utilization of CCETS.	30/09/2027
Maintenance system and implementation	**Deliverable 10 –** Preventive maintenance report for AMS WICR Freezer Rooms, NCD, Mt Hagen, Morobe, Arob, ENB, ESP	31/10/2027
Temperature monitoring and improvement	**Deliverable 11 –** Temperature monitoring institutionalization framework developed and implemented in 22 PHAs, with designated focal persons, use of standardized reporting mechanisms, routine temperature data reviews, documented corrective actions and quarterly performance reports.	30/11/2027

Final synthesis and handover	**Deliverable 12 –** Final consultancy report, validated output inventory, sustainability and handover plan, and NDoH capacity transfer record.	31/12/2027

Payment Schedule:
Payment will be made on submission and acceptance of deliverables. UNICEF reserves the right to withhold payment in case the deliverables submitted are not up to the required standard or in case of delays in submitting the deliverables on the part of the consultant.

Important Notes

- Individuals engaged under a consultancy or individual contract will not be considered "staff members" under the Staff Regulations and Rules of the United Nations and UNICEF's policies and procedures and will not be entitled to benefits provided therein (such as leave entitlements and medical insurance coverage). Their conditions of service will be governed by their contract and the General Conditions of Contracts for the Services of Consultants and Individual Contractors. Consultants and individual contractors are responsible for determining their tax liabilities and for the payment of any taxes and/or duties, in accordance with local or other applicable laws.
- The selected candidate is solely responsible for ensuring that the health insurance (and visa if applicable) required to perform the duties of the contract are valid for the entire period of the contract. Selected candidates are subject to confirmation of fully-vaccinated status against SARS-CoV-2 (Covid-19) with a World Health Organization (WHO)-endorsed vaccine, which must be met prior to taking up the assignment. It does not apply to consultants who will work remotely and are not expected to work on or visit UNICEF premises, programme delivery locations or directly interact with communities UNICEF works with, nor to travel to perform functions for UNICEF for the duration of their consultancy contracts.
- UNICEF offers reasonable accommodation for consultants with disabilities. This may include, for example, accessible software, travel assistance for missions or personal attendants. We encourage you to disclose your disability during your application in case you need reasonable accommodation during the selection process and afterwards in your assignment.

QUALIFICATIONS / SPECIALIZED KNOWLEDGE / EXPERIENCE/ COMPETENCIES (CORE/TECHNICAL/FUNCTIONAL) / LANGUAGE SKILLS REQUIRED FOR THE ASSIGNMENT

- **Education:** Advanced university degree in supply chain management, Engineering, or other degree in relevant field. Applicable work experience may be substituted in cases where the academic degree is not aligned with a relevant field.
- **Work Experience:**
    - Minimum 5 years of progressively responsible professional experience in immunization supply chain and/or vaccine cold chain management.
    - Demonstrated experience in installation, commissioning, maintenance and performance monitoring of cold chain equipment (CCE), including solar direct-drive refrigeration systems.
    - Experience in preventive and corrective maintenance, temperature monitoring, troubleshooting and development or implementation of sustainable CCE maintenance arrangements.

  - Experience conducting CCE inventories, vaccine storage capacity and gap assessments, equipment prioritization, and development of cold chain improvement or investment plans.
  - Demonstrated experience in capacity strengthening of cold chain technicians and government counterparts, including development of SOPs, technical guidance, training materials and/or maintenance procedures.
  - Experience working with government health authorities and development partners on national or subnational immunization supply chain and cold chain strengthening.
- **Language Requirements:** Fluency in English is required. Fluency in Tok Pisin as a second language is an asset.
- Knowledge/Expertise/Skills:
  - Strong technical knowledge of WHO/UNICEF vaccine management and cold chain standards, WHO PQS requirements, Effective Vaccine Management (EVM), and temperature monitoring systems.
  - Demonstrated technical understanding of solar photovoltaic systems for vaccine cold chain, including site assessment, power/load analysis and system requirements.
  - Experience with digital cold chain equipment inventory and maintenance systems, preferably CCETS or comparable systems.
  - Strong analytical capacity in CCE inventory analysis, storage capacity assessment, equipment gap analysis, prioritization and costed investment planning.
  - Ability to develop technical specifications, SOPs, maintenance plans, training materials and high-quality technical reports.
  - Strong communication, coordination and capacity-development skills, with the ability to work effectively with government counterparts and partners.
- **Desirables:**
  - Previous experience with UNICEF, WHO, Gavi or other international organizations supporting immunization supply chain and cold chain strengthening.
  - Experience supporting Gavi-funded cold chain investments, procurement planning or development of costed national cold chain investment/improvement plans.
  - Experience establishing or strengthening cold chain technician training systems or training centres.