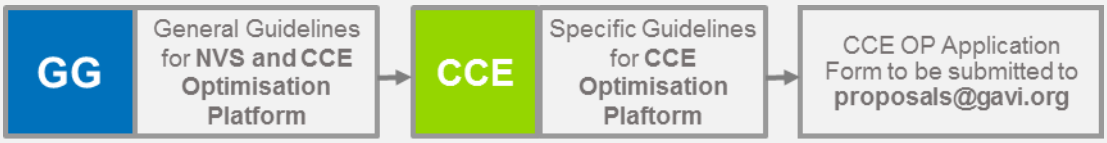
# Application Form for
# Cold Chain Equipment Optimisation Platform
# Support in May-June 2017 only

Document Dated: April 2017

**Application documents for 2017:**

Countries applying for Gavi Cold Chain Equipment (CCE) Optimisation Platform support in 2017 are advised to refer to the following documents in the order presented below:




CCE Application Form

**Purpose of this document:**

This application form must be completed in order to apply for support related to the CCE Optimisation Platform.

Applicants are required to first read the General Guidelines for all types of support, followed by the CCE Optimisation Platform guidelines. Thereafter, applicants should complete this CCE Application Form and submit by email to proposals@gavi.org.

CCE TG

**Resources to support completing this application form:**

**Technology guide for equipment selection** for counties wishing to request CCE Optimisation Platform support is available here: www.gavi.org/support/hss/cold-chain-equipment-optimisation-platform/

**Extensive technical resources** relating to vaccine cold chain equipment management are available on TechNet-21: www.technet-21.org/en/resources/cold-chain-equipment-management

**Weblinks and contact information:**

All application documents are available on the Gavi Apply for Support webpage: www.gavi.org/support/apply. For any questions regarding the application guidelines please contact countryportal@gavi.org or your Gavi Senior Country Manager (SCM).

Countries are informed that based on post IRC recommendations, **final approved amounts may be different** from what countries have requested.

**This final approved amount will be dependent on the availability of funding.**

**Gavi will respect countries' equipment selection. However, countries could also receive their 2nd or 3rd preference based on their selection in the budget.**

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# PART A: APPLICANT INFORMATION

| 1. Applicant information | |
|---|---|
| **Country** | Federal Democratic Republic of Ethiopia |
| **Date** | 2 May 2017 |
| **Contact name** | Dr Ephrem Tekle, Ms Liya Wondwossen, Mr Tesfaye Tsigu |
| **Email address** | Mch.director.fmoh@gmail.com,:epicoordinator.mch@gmail.com; epilogisticscoordintor.mch@gmail.com |
| **Phone number** | +251115151790 |
| **Total funding requested from CCE** Optimisation Platform **(US $)** | *This should correspond exactly to the budget requested in the embedded template.* USD **22,128,186** (**Total CCEOP– 27,660,232** *and* ***Government*** **- 5,532,046**) |
| **Does your country have an approved Gavi HSS support on-going?** | Yes ☑ / No ☐ |
| | *Indicate the anticipated **final year** of the HSS: 2020* |
| **Proposed CCE** Optimisation Platform **support start date** *(please be informed the actual start date should be at least 8-10 months from application date):* | *Indicate the month and year of the planned start date of the support, based on the strategic deployment plan:* ***April 2018*** |
| **Proposed CCE Optimisation Platform support end date:** | *Indicate the month and year of the planned end date of the support, based on the strategic deployment plan:* ***March 2023*** |
| **Signatures** *Include signed (and official) CCE Optimisation Platform application endorsement by:* a) *Minister of Health and Minister of Finance (or delegated authorities)* b) *Members of the Coordination Forum (HSCC/ICC or equivalent body)* | *We the undersigned, affirm the objectives and activities of the Gavi CCE Optimisation Platform proposal are fully aligned with the national health strategic plan (or equivalent) and that the funds for implementing all activities, including domestic funds and any needed joint investment, will be included in the annual budget of the Ministry of Health:* **Minister of Health (or delegated authority);** **Minister of Finance and Economic Cooperation( or delegated authority)** Name: Name: Signature: Signature: Date: Date: |

## PART B: MANDATORY ATTACHMENTS: NATIONAL STRATEGIES AND PLANS

This section provides a list of national strategies, plans and documents relevant to supply chain and requested support, which must be attached as part of the application.

| | |
|---|---|
| ☆ | All documents listed in the table below are **mandatory**, must be **attached** to your application, and they must be **final** and **dated**. Only **complete applications** will be assessed. |

| 2. Mandatory attachments | | | | | |
|---|---|---|---|---|---|
| **No.** | **Strategy / Plan / Document** | **Attached Yes/No** | **Final version (dated)** | **Duration** | **Comments** |
| 1 | Signature sheet for the Minister of Health and Minister of Finance, or their delegates | yes | | | |
| 2 | Minutes of the Coordination Forum meeting (ICC, HSCC or equivalent) endorsing the proposal[1] | Yes | | | |
| 3 | Health Sector Transition Plan (next 20-year format of HSDP) | Yes | Oct, 2015 | 2015/16 – 2019/20 | |
| 4 | cMYP | Yes | Dec, 2016 | 2016 - 2020 | |
| 5 | EVM Assessment | Yes | Sept 2013 | | |
| 6 | EVM Improvement Plan | Yes | Feb 2014 | | |
| 7 | EVM Annual Workplan **and** Progress Report on EVM Improvement Plan[2] | Yes | Feb 2017 | | Progress Report |
| 8 | WHO CCEI Tool/UNICEF IMT/PATH CCEM Tool/CHAI tool | Yes | Apr 2017 | | |
| 9 | Inventory Report and Facilities segmentation | Yes | Apr 2017 | | |
| 10 | Single document:<br>Chapter 1: Cold Chain Rehabilitation and Expansion Plan<br>Chapter 2: Projected Coverage and Equity Improvements<br>Chapter 3: Strategic Deployment Plan<br>Chapter 4: Equipment Selection | Yes | Apr 2017 | 2017- 2022 | |
| 11 | Maintenance Plan with financing and source(s) | Yes | 2016-2020 (April 2017 Review) | 2016-2020 | |
| 12 | Proof of status for CCE tariff exemptions waiver | Yes | | | |
| 13 | Terms of Reference for the relevant Coordination Forum (such as ICC) including all sections outlined in Section 5.2 of the General Application | Yes | | | |

[1] In the case of HSS and CCE Optimisation Platform requests, minutes must reflect that both were discussed and endorsed.
[2] The EVM IP and annual work plan progress report must have been updated within three (3) months before applying for Platform support.

| 2. Mandatory attachments | | | | | |
|---|---|---|---|---|---|
| **No.** | **Strategy / Plan / Document** | **Attached Yes/No** | **Final version (dated)** | **Duration** | **Comments** |
| | Guidelines | | | | |
| 14 | Minutes of the Coordination Forum meetings from the past 12 months before the proposal | Yes | | | |
| | Other relevant documents | | | | |
| 15 | HSS 2016 Application | Yes | | | |
| 16 | Designing a Resilient National Health System | Yes | | | |
| 17 | 2013 CCI report | Yes | | | |
| 18 | Partners_ Engagement Framework and Alliance Accountability Framework (GAVI) | Yes | | | |
| 19 | 2015 JRF | Yes | | | |
| 20 | Constitution of Ethiopia | Yes | | | |
| 21 | PFSA Proclamation | Yes | | | |
| 22 | Ethiopia CCEOP IRC Feedback Second Guidance mark-up and V2 | Yes | | | |
| 23 | First phase Vaccine Supply chain management Transition plan | Yes | | | |
| 24 | Energy Sector Presentation London 2015 | Yes | | | |
| 25 | Equity Plan of Action 2020 | Yes | | | |
| 27 | Report on CHAI Supported End to End Vaccine Delivery Pilot Implementation | Yes | | | |
| 28 | Cold Chain and Vaccine Management _CM _VM and FT Flipchart_ (Job aid) | Yes | | | |
| 29 | Ethiopia Reponses to the revised 9 (Nine) action points of IRC | Yes | | | |
| 30 | Summary of strategic implications of cold chain expansion | Yes | | | |
| 31 | Budget Template | Yes | | | |

**3. How do the above strategies, plans and documents inform the CCE Optimisation Platform support request (initial support and scale-up support)?** *(Maximum 1 page)*

*Countries are encouraged to reference relevant sections of the above documents as much as possible*

**1. Country background and context**

In 1994 the Federal Democratic Republic of Ethiopia (FDRE) was established represented by 9 Regional (Tigray, Afar, Amhara, Oromia, Somali, Southern Nation Nationalities and Peoples Region (SNNPR), Benishangul-Gumuz, Gambella, and Harari) plus 2 city administrations (Dire Dawa and Addis Ababa) and 941 Woreda or District administrations. These 941 Woredas are further divided into about 16,657 Kebeles (Rural 83% & Urban 17%), the smallest administrative unit in the government. Over 80 languages are included. (Refer #20 page 3, 12, #4 page 2). The FDRE occupies an area of 1.1 million square kilometres with a population of 90 million in 2015 (93.35 million in 2016).. The pyramidal age structure of the population has remained predominately young with 44.9% under the age of 15 years. (#3 page 10)

The establishment of essential health services in each district during the 20 years of the HSDP followed the basic principles of the Declaration of Alma Ata (refer #16 page 5) using the Ethiopian Health tier system(refer #3 page 142)

This extraordinary success story of a resilient health system is attributed to the political will of the highest Federal Office, that of the Prime Minister (refer # 15 page 5).It clearly illustrates the constitutional, administrative and strategic expectations of the FDRE and also the logistical challenges to ensure an equitable provision of universal health services for all. (Refer also to #20 Article 41.4 page 14). The EPI program (immunization service) is implemented in all tiers in Ethiopia.

Managing the cold chain logistics in Ethiopia is supported by an effective and dedicated ICC which also includes a well-functioning National Logistics Working Group which is in turn also supported by a functioning Technical Working Group (ref section 4). Ethiopia is part of the Tier 1 Countries for GAVI PEF Funding (ref #18 page 5)

**2. Coverage and Equity**

In the most recent coverage survey conducted (2012); significant regional disparities were observed. Pastoral areas of Somali, Afar, and Gambella are persistently lower coverage as compared to Addis Ababa or Tigray, and Penta dropout rates also are significantly higher. This shows that the percentage of children who are unvaccinated and not reaching full immunized status is higher in pastoral areas. (Refer #4 page 11).

The priority areas indicated in the new cMYP are increasing immunization coverage in all populations with all vaccines particularly among those in hard to reach areas. Equity and quality immunization services will be given due emphasis to be in line with national and global focus. (refer #4 page 9).

The country is aiming to have approximately 26.5 % and 36.5% of additional health posts to be equipped with optimal cold chain equipment using GAVI CCEOP support and SDG-PF, respectively over the next five years. Therefore, within the coming five years, all health centres,

71% health posts, and PFSA Hubs will be equipped with optimal and appropriate cold chain equipment.

Equipping health posts is a top priority for the Government of Ethiopia and is seen as an important step to address the disparity in coverage. This will enable to address some of the challenges in reaching pastoral populations and districts with low immunization coverage in the agrarian Regions and curbing dropout rates by specifically,

(a) Increasing frequency of service delivery- allowing immunization sessions to happen every day in a fixed post – which will complement the outreach session as opposed to a few times a month via outreach

(b) Supporting a broader primary healthcare agenda in line with Ethiopia's new Health Sector Transition Plan. (refer #4 page 38)

### 3. Cold Chain Logistics (refer #4 p38)

At all levels of the supply chain system, the absence of cold chain equipment, obsolete technologies and non-functional equipment constrain the effectiveness of delivering services and limit the overall coverage and quality of the immunization program.

Generally, the strategies in the immunization supply chain design is to use this CCEOP and other funding (such as the SDG-PF) to equip 100% of health centres and health posts with optimal CCE to provide a static immunization services enabling regular, more frequent provision of services to nomadic populations even in remote areas. (Refer #4 page 37). The SDF-PF and the CCEOP Application will enable to cover the 100% requirement of CCE need at the health Center level and close to 70% for major health posts located in different regions.(refer Table 1 below).

The CCE in the CCEOP includes 5,167 SDD refrigerator, 655 ILR with voltage regulator, 10,373 Fridge tag, 200 long term passive devices, and spare parts for all CCE procured through CCEOP. In order to improve immunization quality and coverage, initial distribution plan will be primarily done to pastoralist region and hard to reach areas. The total budget of CCEOP is US $ 27,660,232. Hence, Government will secure 80% funds from GAVI CCEOP and fill the remaining 20% from its treasury (refer section 15 Budget Template). This CCEOP equipment will be procured and deployed according to the priorities set out in sections 9 & 12 to enable the coverage and equity objectives of the EPI and HSS.

**Table** 1: **summary of the CCE current status and future replacement and expansion needs**

| | Health Centers | Health Posts | Total /cumulative average |
|---|---|---|---|
| Total # of facilities | 4077 | 16,447 | 20,524 |
| # of functional CCE (current) | 2,595 | 4,175 | 6,770 |
| **% functional CCE coverage (current)** | **63.65%** | **25.38%** | **32.99%** |
| # of equipment to be replaced | 1,774 | 2,855 | 4,629 |
| # of CCE that meets the quality to stay in the system | 821 | 1,320 | 2,141 |
| # CCE to be procured by SDG-PF | 2,000 | 6,000 | 8,000 |
| # of CCE meeting the quality after SDG | 2,821 | 7,320 | 10,141 |
| **CCE coverage after SDG-PF** | **69.19%** | **44.51%** | **49.41%** |
| CCE to be procured by CCEOP | 1,666 | 4,356 | 6,022 |
| **% CCEOP contribution** | **40.86%** | **25.5%** | **29.2%** |
| # CCE coverage after current SDG and CCEOP | 4,487 | 11, 676 | 16,163 |
| CCE coverage after the current SDG and CCEOP | **100%** | **71.0%** | **78.8%** |
| Number of Health Facilities that needs expansion and replacement | 0 | 4,771 (29.0%) | 4,771 (21. 2%) |

## 4. Choice of CCE

The facility segmentation provided important information in order to systematically allocate appropriate and efficient cold chain equipment technology which will enable the system to meet current as well as future programme requirement. Among the key parameter used to select appropriate CCE technology include the followings: net vaccine storage capacity requirement in three categories ( less than 30 ltrs, between 30 to 60 ltrs and above 60 ltrs), freezing capcity requirement based on the immunization strategy used, energy source availability and temperature zones. Only equipment complying with the extended hot temperature zone and Grade A freeze protection as per GAVI Technology Guide are eligible. The final selection is made based on the PATH TCO Tool. (refer #10 Chapter 4)

## 5. Solar vs Electricity

The Federal Government of Ethiopia recently announced its plans for the next 20 years to increase and expand the electricity supply for the Country by utilising renewable energy specifically using Hydro power, Wind power, Solar power, Geothermal power, Biomass power These projects will roll out over the next 9-10 years. However, the necessary transmission lines may take much longer to reach the 5$^{th}$ biggest consumers of electricity or in other words, universal access, which will include all the health facilities. (#24 page 21). Only 55% of Ethiopia is electrified at this stage. It is therefore appropriate to use solar energy for CCE in the next 10 years in those areas where electricity is not yet available or reliable.

## 6. Optimization of Distribution

In 2007 the PFSA was established by proclamation to provide specific supply chain activities (Role of PFSA (refer #21). Since 2014 PFSA has embarked on the integration of vaccines in their responsibilities and this process is still ongoing.

Vaccines in Ethiopia have been distributed in a 5 tier system, i.e. central to region to zone to Woreda to health centre. PFSA is now working to ensure vaccine is delivered to health facilities bypassing the Regional, l Zonal and woreda level stores. This will create a much more efficient supply chain and the possibility of shorter supply intervals for the peripheral service points. (refer #4 page 71)

## 7. Human Resources in disadvantaged areas and capacity building

The human resources to support this CCEOP roll-out is well described in the HSS2 and will also be funded by the HSS2. Thus far, about 38,000 HEWs have been trained and deployed in agrarian, pastoralist and urban areas through the Health Extension Program (HEP). This translates into 2 Health Extension Workers per immunization point. Simultaneously, the organized Health Development Army (HDAs) which is complimentary initiative to HEP, was initiated in 2012/2013. HDA is designed to ensure the systematic organization of, and inclusive and collaborative movement of the communities through active participatory learning and actions. (Refer #15 page 39). The use of CSOs to further strengthen the human resources and the training of cold chain supply experts is further described in the results chain of the HSS (#15 page 3).

The recruitment and training of CCE Technicians is well described in reference #11 and the

successes to date can be seen in the maintenance of more than 3000 CCE illustrated in the IP Progress Report (ref #7 Item 5 Activities 4-9)

### 8. Data Management

See sections 11 and 14 of this CCEOP and also see ref #15 page 39

**4. Describe how supply chain stakeholders (including Coordination Forum (ICC/HSCC or equivalent), government, NLWG, NITAG, key donors, partners, CSOs and key implementers) have been involved in the application development** including if the quorum at the endorsing meeting was met

**Does the country have a permanent and functioning National Logistics Working Group (NWLG)? If No, does the country plan to establish one and when?**

*Gavi and its Alliance partners encourage the establishment of such group that coordinates Government and non-Government partners 'activities and investments related to the health supply chain including immunization.*

**Were any of Gavi's requirements to ensure basic functionality of Coordination Forums not met? Then please describe the reasons and the approach to address this (refer to section 5.2 of the General Guidelines for the requirements)** *(Maximum 1 page)*

All GAVI requirements to ensure basic functionality of coordination forums have been met as summarized below. Moving forward, the ICC will continue to include additional relevant members and document all minutes

1. Membership
   - The ICC is chaired by the State Minister, ministry of Health (Refer#13 Page10)
   - Members from FMOH relevant directorates and agencies, donors and implementing partners, CSO representative (CCRDA) are included (Refer # 13 page 6)

2. Mandate:
   - The ICC review and endorse applications for submission to Gavi
   - Involves various technical working groups and relevant stakeholders in the application development process (as already mention in the first paragraph above)

3. Governance
   - The ICC has formal and approved TOR (Refer # 13)
   - Decision making process is based on the quorum indicated on the TOR
   - Minutes of the ICC are recorded (Refer # 14)

The country has a permanent National Logistics Working Group (NLWG) chaired by FMOH.

The NLWG is constituted by experts from FMOH, PFSA, WHO, UNICEF and CHAI. It is one of the sub working groups functioning under the national immunization task force which reports to the ICC.

The NLWG provides guidance, expertise and technical assistance on all matters concerning supply chain operations and improvement initiatives in the immunization program. It mainly support implementation of assessment tools and developing key guidance documents including the EVMA, EVM IP, CCI, CCR&EP, GAVI HSS, and CCEOP by engaging key stakeholders in the process to share information and evidence. The NLWG has been instrumental in improving the performance of supply and cold chain management at all levels.

Similarly, regional level logistics working group established and supporting supply chain activities of their respective region. The regional level logistics working group team is also constituted by experts from regional health bureaus and partner organization working in the regions.

CSOs members are also supporting supply chain in providing the trainings on cold chain equipment maintenance, supporting supply distribution and collection, implementation of service delivery at their respective work area, mainly in the very hard to reach and pastoral areas. In addition they are represented in ICC through CCRDA- core group and are part of the decision making process at national level.

## Part C: Situation analysis and requested support

This section gives an overview of the types of information the IRC will anticipate from countries in their application for CCE Optimisation Platform support. This section must be filled with appropriate reference to the country documents listed in Part B. Countries are required to provide a narrative in response to the following questions.

**5. Situation analysis of country's supply chain and CCE** (number, distribution, functionalities etc.) *(Maximum 3 pages) Please respond to all questions*

**Countries are encouraged to cross reference (document title, page number) attached mandatory documents.**

*Information is required to cover the following areas:*

*a) How is the country's immunisation supply chain administered?*
*b) What weaknesses have been identified in the country's supply chain?*
*c) Through what interventions are these weaknesses currently being addressed?*
*d) Describe challenges that are hindering the implementation of these interventions.*
*e) Describe lessons learnt from recent supply chain related support that inform the current request for CCE Optimisation Platform support.*
*f) What percentage of facilities have reliable access to grid electricity for up to or more than 8 hours per day?*
*g) Please give the quantity and percent of current CCE that is: a) functional; b) PQS-approved; c) non-PQS-approved; and/or d) obsolete?*
*h) What percent of the birth cohort is served by effectively functioning, PQS-approved CCE currently?*

*i) What are the bottlenecks that CCE can address in the current supply chain set-up (for example, capacity and technology constraints)?*

*j) Describe any other supply chain challenges that CCE Optimisation Platform support will assist in mitigating?*

*k) What are the overall CCE needs?*

**How is the country's immunisation supply chain administered?**

The Ethiopian immunization supply chain was structurally organised into five levels of storage: one National Store, 9 regional stores (RVS), 103 zonal hubs, 941 woreda (district) stores, 311 hospitals, 3, 766 health center and 16,447 health posts. However, the system is in a state of transition to a 3 tier system (1 National, 17 PFSA hubs and 20,524 health facilities). Pharmaceuticals and Funds Supply Agency (PFSA) which is responsible for storage and distribution of vaccine stock, is embarking on a streamlining of the distribution system bypassing the Regional, Zonal, District Stores and eventually to deliver vaccines directly to Health Centers. This is expected to create a much more efficient supply chain system and the possibility of shorter supply intervals for the peripheral service points. (Refer #4 page 71).

The national, regional and woreda governments and PFSA share roles and responsibilities across the following components of the immunization supply chain:

**Forecasting**: Forecasting of the immunization supplies and cold chain equipment is carried on by FMOH with the technical support from NLWG. Once the forecasting is completed, procurement of vaccines and cold chain equipment is done through UNICEF and procurement of cold chain equipment can also be done through PFSA. Cold chain equipment forecasted for the CCEOP support will be procured via UNICEF.

**Warehousing**: PFSA is responsible in availing storage facilities for health commodities including vaccines, supplies and cold chain equipment. While FMOH is responsible to facilitate custom clearance processes, PFSA is responsible in executing custom clearance of immunization supplies and cold chain equipment (Refer # 20). All cold rooms and refrigerators have RTMD and 30-DTR, respectively.

**Distribution and Installation:** PFSA is mandated to conduct the distribution of cold chain equipment to district and facilities based on the FMOH distribution plan. The installation can be done through in-sourced and out-sourced maintenance system. FMOH organizes, leads and oversees the installation of cold chain equipment at the regional, zonal, district and health facilities level. (Refer# 20). In relation to the CCEOP support, suppliers are responsible for warehousing, distribution, and commissioning of CCE.

**Maintenance:** The FMOH is responsible at national level in leading the forecasting and initiating the procurement of spare parts, planning and capacity building activities to technicians for PFSA central, PFSA hubs, regional, zonal, district and health facilities. The corrective and curative maintenance at sub regional level is facilitated and monitored by Regions, Zones and Districts. PFSA is responsible for the maintenance activities of the CCE with in the premises of PFSA (PFSA central and PFSA hubs).(refer #11)

**Data Management:** PFSA controls and manages the logistics management information system at national and sub national level to provide supply data and enable efficient distribution of supplies. FMOH is responsible to oversee the implementation and primarily use data generated

from CCEI data base system.

**Monitoring and Evaluation:** FMOH monitors and evaluates the immunization supply chain and cold chain system of the country regularly. FMOH is responsible to conduct regular assessment to identify gaps and challenges for improvement including the EVMA. FMOH will conduct regular quarterly supervision at PFSA, PFSA Hubs, sub-regional and HFs level to assess and measures the implementation of improvement plan and challenges.

**Decommissioning:** The Food Medicine Health Administration Control Authority (FMHACA) is mandated with decommissioning and disposing all health and health related supplies and equipment. The decommissioning of obsolete refrigerators and non-functional cold chain equipment is handled under the regulation and guidance of this authority (#10.3). The Technical working team, which is led by FMHACA in collaboration with FMOH and partners, develops CCE tailored comprehensive disposal guideline for obsolete and non-functional equipment. . In addition to guideline, the FMOH will prepare a detail plan for the collection of CCE with hazardous refrigerants and dispose as per the country and global legislation and guideline.

***What weaknesses have been identified in the country's supply chain?***

The EVM assessment has identified several challenges that hinder Ethiopia's ability to achieve equitable coverage across the country. The most acute equity challenges are observed in pastoral and hard-to-reach areas which have fewer resources in terms of CCE availability, infrastructure, maintenance, temperature excursion monitoring, and distribution. In addition, the lack of a comprehensive, strong logistics management information system, inadequate reliable cold chain transportation system, and distribution challenges across multi-tier supply chain levels contributed to frequent stock-outs of safe and potent vaccines, unreliable stock delivery at districts and HFs, impacting the coverage of life saving vaccines particularly in developing regions.

**Through what interventions are these weaknesses currently being addressed?**

In order to address most of the challenges identified in the EVM assessment, FMOH develop and implement EVM improvement plan over the years. As part of this process, Ethiopia has invested significantly in procuring optimal CCE and other resources to manage the supply chain effectively including the 20 refrigerator trucks for PFSA hubs, procuring and installing over 2,134 SDDs, installing 17 remote temperature monitoring device (fridgefoneR) to cold rooms and 13,700 fridge tags at vaccine storage sites. Moreover, cold chain infrastructural expansion completed in PFSA hubs along with the capacity building activities for supply chain managers and health workers. FMOH support PFSA in the process of receiving the responsibilities and mandate of vaccine management and distribution that reduce the distribution system from five to three tier system.

In addition to these the following targeted interventions are also being implemented:

- Procuring new cold rooms to PFSA
- Optimal CCE to be procured to replace obsolete equipment and extend the network to remote and hard to reach areas through SDG-PF and CCEOP.
- Feedback on immunization supply chain activities will be given by FMOH in a weekly basis to RHB Head, program managers, supply chain managers and all stakeholders
- Conducting regular supportive supervision, feedback and review meetings to improve usage of temperature data and respond to malfunctioning CCE/ temperature excursions

- Rolling out CCEI database across health facilities to track cold chain capacity and functionality across sites
- Institutionalize a standard vaccine requisition form (VRF)
- Rolling out the LMIS data base system to improve stock visibility and respond to stock-outs in a timely manner
- Procuring additional optimal CCE to replace obsolete equipment and extend the network to remote and hard to reach areas through SDG-PF and CCEOP.
- Sustained advocacy to staff and equip health posts in order to strengthen availability of immunization services and improve coverage.

**Describe challenges that are hindering the implementation of these interventions.**

- Unreliable stock management at HFs level
    - Internet connectivity is hindering the HCMIS dash board Roll out
- Structure (Post) for CCE for maintenance
    - Readiness on RHB and districts to create the structure and appoint staff at all level

These interventions have been primarily hindered by funding constraints especially at Regional Health Bureau and district levels to support CCE procurements and rehabilitating health post expansion with the right equipment and staff. Some of the interventions with respect to tools (e.g. rollout of HCMIS dash board) has also encountered practical challenges such as lack of internet connectivity which has led to unreliable stock management at HFs level.

**Describe lessons learnt from recent supply chain related support that inform the current request for CCE Optimisation Platform support.**

FMOH procured 1,000 SDD through UNICEF and warehousing and distribution were made by PFSA and installation was undertaken by technicians at RHB, zonal and woreda health offices with the coordinating roles of FMOH and RHB. In these cases, PFSA was responsible for warehousing and transportation services up to the district level.

Though a standard comparative assessment is not conducted, supervision and feed backs from RHB and ZHD mainly requires the need for CCE with bundled services on warehousing, transportation up to health facility level, and commissioning. However, the involvement of mid-level and senior-level technicians is critical as part of the capacity building activities in bundled services CCE procurement. From the previously procured SDD, all requirements were learnt and can be applied to the CCEOP application to apply to the CCEOP support. Improvement plan on maintenance and capacity building plan on technicians provided a basis for future institutionalization on the functionality of CCE maintenance.

**What percentage of facilities have reliable access to grid electricity for up to or more than 8 hours per day?**

Only 55% of health facilities have access to grid electricity for more than 8 hours per day. The Federal Government of Ethiopia recently announced its plans for the next 20 years to increase and expand the electricity supply for the Country by utilising renewable energy specifically using Hydro power, Wind power, Solar power, Geothermal power, Biomass power. However as these projects will roll out only over the next 9-10 years and the necessary transmission lines may take

much longer to reach the health facilities, the application has invested heavily in off-grid SDDs to equip these devices. (#24 page 7, 16, 17, and 21)**Please give the quantity and percent of current CCE that is: a) functional; b) PQS-approved; c) non-PQS-approved; and/or d) obsolete?**

*Notice: The figure is based on the revised CCI version. It does more focus on the currently used CCE of which 4,059 are old PQS CCE technology and about 545 not defined to be replaced in addition to the very old CCE which are kept or in circulation.*

**What percent of the birth cohort is served by effectively functioning, PQS-approved CCE currently?**

| Description | # | % |
|---|---|---|
| Functional (based on technology and age) | 5,732 | 85% |
| PQS approved | 2,166 | 32% |
| Old PIS approved and not in the PQS | 4,059 | 60% |
| Non PQS approved | 545 | 8.1% |
| Obsolete | 147 | 2% |

The 2016/2017 under one birth cohort of Ethiopia is 3 million, But only 11% of the birth cohort is served by effectively functioning, PQS approved non-obsolete equipment.

**What are the bottlenecks that CCE can address in the current supply chain set-up (for example, capacity and technology constraints)?**

- Equipping HPs in hard to reach areas will extend the supply chain increase coverage and equity.
- Ensuring adequate capacity at sites taking into account new vaccine introductions and population growth.
- Modifying frequency of service delivery- allowing immunization sessions to happen every day in a fixed post - as opposed to a few times a month via outreach;
- Supporting a broader primary healthcare agenda in line with Ethiopia's new Health Sector Transition Plan. Since the vaccines would be on-site at each HP, the Health Care Worker can save time and costs involved in picking up vaccines for outreach and instead dispense immunization or other PHC services. (refer #4 page 38)

With the health post expansion — including the placement of equipment at these sites — Ethiopia is seeking to address a number of key inequities and gaps in its immunization system. This is in line with the national cMYP, which aims to increase and sustain high vaccination coverage (90% national coverage and 80% in every district with all vaccines) by 2020 and ensure availability of immunization service in all kebeles (#4,page 63).

Specifically, Ethiopia is prioritizing gaps that affect the equity of immunization coverage in key areas:

- Developing/pastoralist regions (i.e. Afar, Somali, B/Gumuz and Gambella) that have mobile populations and struggle to access existing services traditionally
- Remote and hard to reach facilities especially in districts with lower than 80% immunization coverage rate
- Facilities in agrarian regions which are 5 km from the nearest cold chain equipped facility to ease the burden on health care workers who spend time collecting vaccines from storage sites.

- Equipping sites with SDDs can help avoid logistical challenges in providing fuel (e.g. kerosene) to operate absorption refrigerators that disrupt immunization services especially in hard to reach, remote areas.

**Describe any other supply chain challenges that CCE Optimisation Platform support will assist in mitigating?**

- It is going to replace the sub optimal CCE with reliable CCE
- Replacing the obsolete and aged CCE
- Minimize the failure of CCE due to power fluctuation due to voltage stabilizer
- Procurement of spare parts to strengthen maintenance which will be used for the maintenance of newly procured optimal cold chain equipment and existing CCE
- Procurement of continuous temperature monitoring devices(fridge tag 2E)

**What are the overall CCE needs?**

Refer to revised CCI and CCREP and the table below provide a summary of new technology (SDD and ILR, and PVSD), 30 DTR, Spare parts and Voltage stabilizer

**Table 2: Overall CCE need for initial and scale up phase is presented below**

| Model | Initial Phase | | | | Scale up Phase | | | | Grand Total |
|---|---|---|---|---|---|---|---|---|---|
| | Need #1 | Need #2 | Need #3 | Sub total | Need #1 | Need #2 | Need #3 | Sub total | |
| | 2018 | 2019 | | | 2020 | 2021 | 2022 | | |
| VLS 200A Green Line | 13 | 20 | 14 | 47 | 233 | 294 | 0 | 527 | 574 |
| VLS 400A Green Line | 2 | 5 | 15 | 22 | 53 | 6 | 0 | 59 | 81 |
| ARKTEK-YBC-5 | 0 | 0 | 0 | 0 | 200 | 0 | 0 | 200 | 200 |
| VLS 024 SDD Green Line | 526 | 473 | 199 | 1198 | 0 | 2037 | 0 | 2037 | 3235 |
| VLS094 Greenline SDD | 173 | 15 | 49 | 237 | 625 | 0 | 0 | 625 | 862 |
| TCW 15 SDD | 370 | 158 | 86 | 614 | 0 | 251 | 0 | 251 | 865 |
| TCW 40 SDD | 62 | 6 | 24 | 92 | 113 | 0 | 0 | 113 | 205 |
| Sub-total | 1,146 | 677 | 387 | 2210 | 1,224 | 2588 | - | 3812 | 6022 |
| Fridge-Tag 2 E | 1146 | 3205 | | 4351 | 1224 | 2588 | 2210 | 6022 | 10373 |
| Voltage regulators | 15 | 25 | 29 | 69 | 286 | 300 | 0 | 586 | 655 |
| Spare parts for New CCE | 1146 | 677 | 387 | 2210 | 1024 | 2588 | 300 | 3912 | 6122 |

## 6. Expected immunisation coverage, equity and sustainability results *(Maximum 2 pages)*

*Please respond to all questions*

**Countries are encouraged to cross reference (document title, page number) attached mandatory documents.**

*Information is required to cover the following areas:*

*a) How will the requested Platform support concretely contribute to addressing identified geographic and socio-economic inequities and gender barriers to sustainable improvements in coverage and equity of immunisation? Examples may include (not exhaustive):*

- *Geographically remote districts or those with low coverage*
- *Poorer communities (e.g. in the poorest 10% of the population)*
- *Communities where gender barriers are significant and/or where low levels of female education is common (as this is often associated with lower coverage)*

*b) What analyses have been made, or what plans are underway, to optimise the design of the supply chain distribution system in order to improve the efficiency of the supply chain and contribute to achieving coverage and equity goals?*

*c) How have these system design considerations impacted the choice of CCE to be supported by the Platform?*

*d) Concretely, how will Platform support help improve the sustainability of the supply chain system?*

*a) How will the requested Platform support concretely contribute to addressing identified geographic and socio-economic inequities and gender barriers to sustainable improvements in coverage and*

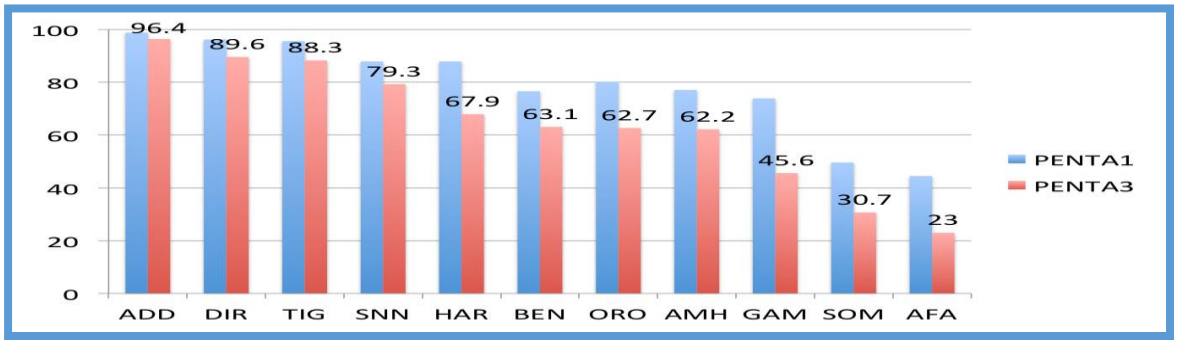
*equity of immunisation? Examples may include (not exhaustive):*

a. *Geographically remote districts or those with low coverage*
b. *Poorer communities (e.g. in the poorest 10% of the population)*
c. *Communities where gender barriers are significant and/or where low levels of female education is common (as this is often associated with lower coverage)*

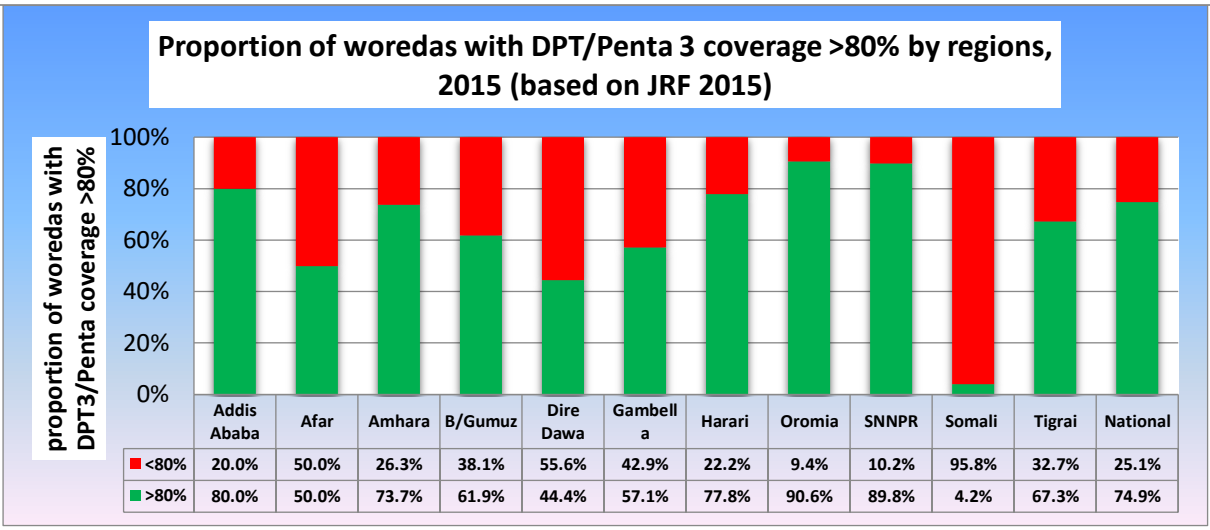
There is mal-distribution of cold chain equipment and hence disparity of access to immunization services in Ethiopia. As a result of this horizontal inequity, the coverage is low and dropout is high in pastoral regions of Ethiopia. In addition there is vertical inequity by society characteristics. The fully vaccination coverage in 12-23 month old children as per the coverage survey 2012 was 65% in urban versus 35% in rural, 72% for educated mothers versus 31% for mother with no education, 61% among mothers of highest wealth quintile versus 26% among mothers of lowest quintile mothers (refer #25 page 27).

These disparities are especially acute in some regions and zones with a high proportion of pastoralist communities which are nomadic, poor and have low immunization coverage. Recognizing these disparities the CCEOP prioritizes equipping health facilities in regions and zones with large proportions of pastoralist communities. As illustrated in the most recent coverage survey conducted (2012); significant regional disparities were observed with pastoral areas of Somali, Afar, and Gambella having persistently lower coverage and higher Penta dropouts as compared to Addis Ababa or Tigray with the differences observed ranging from 9% to 65% lower (refer #4 Fig 3 page 11).

***Ethiopia: EPI Coverage by Region, Coverage Survey, 2012***




In 2013/2014 (2006 EFY), administrative coverage of Pentavalent 3, and Measles was reported to be 96%, and 92% respectively. However, a significant equity gap in immunization coverage remains- in hard to reach or remote regions such as Somali, Afar and Gambella, with high proportion of pastoralist/nomadic populations, Penta3 coverage was reported to be less than 50% (admin coverage 2006 EFY).




| | Addis Ababa | Afar | Amhara | B/Gumuz | Dire Dawa | Gambella | Harari | Oromia | SNNPR | Somali | Tigrai | National |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| <80% | 20.0% | 50.0% | 26.3% | 38.1% | 55.6% | 42.9% | 22.2% | 9.4% | 10.2% | 95.8% | 32.7% | 25.1% |
| >80% | 80.0% | 50.0% | 73.7% | 61.9% | 44.4% | 57.1% | 77.8% | 90.6% | 89.8% | 4.2% | 67.3% | 74.9% |

The CCEOP will ensure horizontal equity by availing static immunization services to those hard to reach and underserved communities. The availability of static immunization service will increase the frequency of immunization service within a reasonable distance to those disadvantaged communities which will result increased access and utilization of immunization services and hence increase in coverage and reduction of dropouts.

In addition, availability of immunization sites in hard to reach areas will minimize immunization coverage gaps among people of different social characteristics. Poor people do not have the time and money to take their children to immunization as frequently as rich people. However, the more immunization sessions are conducted the more chance will the poor people have to seek immunization service like when the days are non-working days or holidays. More over with the availability of static immunization sessions, health workers can plan special sessions tailored to the need of poor, uneducated or other disadvantage group of people at their convenient time and place The government is also linking Productive Safety Net Program (PSNP) services with immunization in drought affected woredas to ensure the poorest people equitably utilize immunization services in such areas. For poor mothers with under one year children, certification of child immunization will exempt them from public works to benefit from the PSNP.

*b) What analyses have been made, or what plans are underway, to optimise the design of the supply chain distribution system in order to improve the efficiency of the supply chain and contribute to achieving coverage and equity goals?*

The supply chain is redesigned in Ethiopia and the country is in the process of transitioning from a 5 to 3 tier supply chain delivery system. This will shorten the chain of supply chain and reduce the intermediate cold stores in the country from 5 to 3 levels. This will reduce the lead time in vaccine delivery and ensure continued vaccine availability and reduce vaccine stock outs. It will also increase the efficiency of the supply chain as there will be maximization of resources when the distribution is done from the hubs to the nearby catchment areas since less person time will be needed to deliver the vaccines rather than the collection of vaccine from lower level to the upper level of the supply chain system.

The continued availability of vaccines and immunization accessories at all times which will in turn increase the immunization coverage will ensure to address gaps in equity and quality. An

evaluation of the new supply chain design implementation in three zones showed that stock out for one or more antigen was 6% in health facilities with direct delivery to HF level compared to 21% for Health facilities in zones with delivery to zonal level only. Comparison of estimated total person-time required to collect vaccine by woreda health offices with the total person-time (in days) required for vaccine distribution to all woredas during end to end vaccine distribution in one round of distribution showed that on average about 73.3% of the person-time would be saved. (Refer #27 page12 and page 17). The use of refrigerated trucks would also increase the delivery of safe and potent vaccines to the clients.

*c) How have these system design considerations impacted the choice of CCE to be supported by the Platform?*

The lowest service delivery point in Ethiopia is the Primary HealthCare Unit (PHCU), which consists of one HC with 5 HP. The 3-tier system design effect on the choice of the CCE is that most of the CCE in the CCEOP are going to be SDD and of small size because health posts catchment population is around 5,000 and most health posts do not have electric power supply.

Bypassing the zonal and district stores has enable us to reduce the required equipment (2,172 CCE).

*d) Concretely, how will Platform support help improve the sustainability of the supply chain system?*

More secure cold chain environment by replacing kerosene refrigerators with optimal CCE. Which help for hard to reach community to be vaccinated with potent and good quality vaccines and achieve high coverage. As SDD are optimal CCE which are user independent, there is less maintenance cost. Kerosene refrigerators maintenance is costly as well as the cost of kerosene, consumables range between 50-100 USD per year, which amounts to more than 5 million USD per year for the currently available kerosene refrigerators. Hence the shift to SDD in the CCEOP will result in a saving of a lot of money every year which can be used for maintenance of the CCE that will be procured in the CCEOP ensuring sustainability of the CCEOP investment.

**7. Maintenance plan (and its source of funding) and equipment disposal** *(Maximum 2 pages) Please respond to all questions*

**Countries are encouraged to cross reference (document title, page number) attached mandatory documents.**

*Information is required to cover the following areas:*

*a) How will the country ensure that aspects of maintaining the cold chain are addressed (e.g. preventive and corrective maintenance, monitoring functionality, technicians, financing for maintenance, etc.)?*
- *What is the frequency of preventative and corrective maintenance that the country commits to (supported by partners)?*
- *What technical support is anticipated for maintenance?*

*b) How will the country monitor the completion of preventive and corrective maintenance?*
- *Which source(s) of funding will be used for maintenance, and to what extent are they assured?*

*c) How will the country dispose of obsolete and irreparable equipment replaced by CCE Optimisation Platform equipment?*

a) *How will the country ensure that aspects of maintaining the cold chain are addressed (e.g. preventive and corrective maintenance, monitoring functionality, technicians, financing for maintenance, etc.)?*
    a. *What is the frequency of preventative and corrective maintenance that the country commits to (supported by partners)?*
    b. *What technical support is anticipated for maintenance*

Maintenance services in Ethiopia are structured around the administrative levels of the cold chain, with dedicated focal persons at each level of FMOH vertical structure (FMOH, Region, Zones, Districts and HFs).

*a)* National, Regional & Zonal Levels: At these higher levels of the cold chain, biomedical engineers and technicians have been assigned by the government to (i) perform all maintenance activities for their respective levels, and (ii) support advanced maintenance needs escalated from their respective lower-level sites.

*b)* In addition, FMOH is establishing 13 hospital based maintenance workshops at different sites across the country to address escalated maintenance requests from all levels. These sites will then become permanent maintenance training sites. This Hospital maintenance workshop centers will be used for maintaining equipment of hospitals and health centers in the referral catchment. (#25 Equity plan page 22)

*c)* District Levels: Trained focal persons are available at Woreda health office for mid-level corrective and preventive maintenance for the district stores and associated health facilities

*d)* Health Facility Level: More than 920 trained Health workers form health facilities and PFSA cold stores trained on basic vaccine management, including basic preventive maintenance activities (#7, Page 7 & 8), and their primary responsibility is routine preventive maintenance and monitoring of their respective CCE and escalating requests as needed woreda mid-level technicians. The training of HCW on preventive maintenance will be continued.

PFSA will be responsible for the maintenance activities of CCE at PFSA premises (central and branch hubs). They will ensure proper functioning of cold room and refrigerators with in PFSA premises using technicians at PFSA or in collaboration with technicians available in the RHBs. .

To strengthen maintenance of medical equipment, recruitment of additional biomedical engineers at regional level will facilitate skill transfer from biomedical engineers to woreda level technicians (#25 Equity plan page 48). Incentives for highly trained technicians and biomedical engineers based on performance will be considered (#25 Equity plan, Page 24). Build maintenance mechanisms and ensuring availability of skilled maintenance professionals for equipment will be major activity.

Moreover, a collaborative program opened with universities and colleges have given due attention and currently Addis Ababa Tegbare-id Polytechnic College (2015) and Jimma university have already started the project in 2016 which can be sustained source of biomedical technicians who are trained in hands-on CCE repair and maintenance.

Therefore, Addis Ababa Tegbare-id Polytechnic College and other universities (Jimma & other universities) will be supported technically by FMOH and partners, to produce skilled engineers

and technicians in cold chain equipment maintenance and universities expected to allocate budget to strengthen their workshops and training materials.(#11, page 8)

a) **What is the frequency of preventative and corrective maintenance that the country commits to (supported by partners)?**

Cold chain equipment users/ Health workers at facilities are getting and will be trained on preventive maintenance by using already available user level manual. (#11, page 10). However if serious problem is identified, it can be escalated to mid-level technician at district health offices. Mid-level technicians for district level are trained on basic routine and preventive maintenance on the cold chain equipment which includes replacement of some spare parts like thermostat, wick, burner, etc. In addition, corrective maintenance– will be given based on a request-escalation model. In this system, successively higher level cold chain technicians possessing greater training and access to resources (spare parts, tool, and paint), are responsible for filling requests escalated to them by the lower levels, as needed. To improve maintenance skills, including preventive maintenance skill in-service/refresher training will be given to 300 technicians per year by FMOH (# 10, page 9).

b) **What technical support is anticipated for maintenance?**

**Visibility into Maintenance Needs**: A successful maintenance model requires visibility into how maintenance service delivery needs are identified and tracked. The country was developed an updatable, real-time cold chain inventory database, which is deployed since 2016; however, this database modified to ensure it can trigger, track, and resolve maintenance requests and spare parts management (expected in 2018) as well. This database will be used at all levels in the beginning of 2018. At lower level it will be offline and web-based for higher for total transparency and management.

**Human resource development and Staff Training**: Currently most of the regional, zonal and districts hospitals recruited biomedical engineers and technicians. Recruited and assigned Technicians must be receive additional training specifically for vaccine cold chain equipment. This is training presented as in-service training which has been going since 2015. A package of universities/college and post-hiring development training is essential to ensure technicians have these specific skills, including such elements as technical training guides on specific equipment, processes for how to escalate critical service issues, and administrative training on how to respond to and resolve maintenance requests.

Specifically, SDD refrigerators are a new device category introduced within the last two years and their maintenance capacity will be expanded in the country by working with suppliers in the CCEOP.

- **Standard Operating Procedures (SOPs):** There are maintenance manuals for three level (user, mid-level and senior) in-service trainings and these manuals discussed activities to be implemented at various level and technicians and users are using them to guide maintenance activities. But separate and detail SOP for cold chain equipment maintenance will be developed by 2018.

- **Revision of in-service training curriculum and manuals:** Currently there are maintenance manuals for three level (user, mid-level and senior) trainings which are in use to train users (HCW) for five days, woreda/mid-level technicians for 10 days and senior level technicians for 30 days. \previous training manuals will be updated/revised to include the new technologies for cold chain management.

- **Job Aids on preventative and corrective maintenance tasks:** Job-aid (flip chart) designed for cold chain equipment preventive maintenance, vaccine management and temperature monitoring and distributed to all level (#28). Based on new technologies and new vaccines coming in to the system job-aids will be revised, printed and distributed to all level users of cold chain equipment. (document number) (The revision of the job-aid is started by senior technicians and it will be printed and distributed in quarter 1st Q of 2018.

*e) How will the country monitor the completion of preventive and corrective maintenance?*

*a. Which source(s) of funding will be used for maintenance, and to what extent are they assured?*

In order to ensure a proper implementation of the maintenance activities, at all level a record of maintenance will be done. Moreover, a regular supportive supervision for the maintenance activities will be done using the cold chain equipment maintenance specific checklist. Corrective maintenance will be reported as recorded on recording and both maintenances (preventive and corrective) will be supported by review meeting on the cold chain maintenance. Generally, the FMoH has a direct oversight of the maintenance plan with the technical support of a technical logistics working group with the indicators of:

1) Functionality of cold chain equipment,
2) Downtime of the cold chain equipment
3) Availability of the trained technicians in all levels of the health system,
4) RHBs/ZHOs/districts health offices with cold chain technicians/biomedical engineers post

*The country's maintenance plan identifies who is responsible to secure and release funds at each level of the supply chain. Government and partners including GAVI through the GAVI HSS, UNICEF, WHO, CHAI and other partner will allocate budget and technical resource for the implementation of maintenance plan. Budget sources will be Government (Pool fund & it's own government), UNICEF, WHO & CHAI 13,308,000; 5,200.000; 2,932,000 & 1,349,000 respectively (#11, page 15).*

*f) How will the country dispose of obsolete and irreparable equipment replaced by CCE Optimisation Platform equipment?*

Technical working team, which is led by FMOH in collaboration with partners working on the development of comprehensive disposal guideline for obsolete and non-functional equipment and it will be incorporated in to EPI policy guideline. In addition, the FMOH will prepare a detail plan for the collection of CCE with hazardous refrigerants and dispose as per the country and global legislation. Therefore,

- Guidelines related to disposal of obsolete equipment of different organization in the country including Environmental Protection Agency, Ministry of Finance and Economy Corporation, and Food, Medicine and Health care Administration and control Authority will be assed
- Cold chain specific guideline will be developed by technical working team and gate approval from government and use in the coming five years in consultation with relevant organization.

In addition to guideline, the FMOH will prepare a detail plan for the collection of CCE with hazardous refrigerants and dispose as per the country and global legislation and guideline.

All obsolete EPI refrigerators will be disposed accordingly and its implementation will be reviewed at the end of initial phase (2019) and final review will be at the end of scale-up phase

(2022).

**8. Other implementation details** *(Maximum 1 page) Please respond to all questions*
**Countries are encouraged to cross reference (document title, page number) attached mandatory documents.**

*Information is required to cover the following areas:*

a) *How will the country facilitate the manufacturer's or representative's role in equipment purchase, distribution and installation?*
b) *What is the source of the joint investment? Is the country's joint investment secured?*
c) *Has the country secured import tariff exemptions for CCE? If yes, attach proof.*

a) *How will the country facilitate the manufacturer's or representative's role in equipment purchase, distribution and installation?*

Equipment requested in the CCEOP will be procured through UNICEF according to the bundling requirement of GAVI which includes delivery in country, storage prior to distribution, delivery to health facilities, installation at HFs and training of health workers to technicians. directly with the manufacturers ensuring compliance with all standards. Under this arrangement, there is guarantee for compliance to all specification and standards for all the proposed equipment.

All HFs identified for provision or replacement of CCE will be reviewed before the arrival of the equipment ordered to ensure that those facilities are ready in terms of quality of physical structures, skilled personnel and general security. This is to ensure deployment of CCEs to areas that they will be optimally put to use. As soon as the equipment arrives the country, the manufacturer will be responsible to ensure a proper warehousing of the CCE, distribution, installation, commissioning and decommissioning. Ministry of Health will oversee the overall activities and support the manufacturer for any administrative problems they might encounter.

The FMOH will specifically assist with:

- Operational Deployment Plan (list of facilities where equipment is to be deployed)
- Provide site characteristics (including accessibility, quality of roads, distance to nearest supply point, etc)
- FMOH facilitate any facilitation required by the manufacturer

**What is the source of the joint investment? Is the country's joint investment secured?**

80 % of the investment will be funded by GAVI CCEOP support and 20% of the joint investments will be provided by FMOH. FMOH will pay 20% cash contribution required to the CCEOP and the budget allocated for the co-financing will be reflected in the annual budget Plan of the FMOH. Based on the decision letter that will come from GAVI, FMOH will transfer the budget to UNICEF on annual basis to trigger procurement of bundled CCE requested in the CCEOP. The total co-investment amount is **$ 5,532,046.**

| |
|---|
| FMOH will pay the whole taxes related to the importation of the CCE procured through the CCEOP support and GAVI's budget will not be used for any payment related to taxes.(#12 Commitment letter attached) |

## PART D: INITIAL SUPPORT PHASE

This **initial support phase** (through years 1 and 2) is designed to address urgent CCE needs contributing to improvements in coverage and equity, to protect vaccine stocks, complement investments in other supply chain 'fundamentals' and contribute to full scale-up of optimised, sustainable supply chains.

| | |
|---|---|
| ☆ | Budgets are **not inclusive** of operational cost.<br>Operational costs must be financed by Ministry of Health or other partners. |

| | |
|---|---|
| CCE | Further information on CCE rehabilitation and expansion plan, equipment selection and strategic deployment plan requirements is provided in Annex 3 of the CCE Optimisation Platform Guidelines, available at www.gavi.org/support/apply/ |

| **9. Prioritised (Urgent) CCE needs** *(Maximum 3 pages)* | |
|---|---|
| *Provide information on **2 to 4 prioritised (urgent) CCE needs** as identified in the 'CCE rehabilitation and expansion plan, equipment selection and strategic deployment plan requirements'.*<br>*For each prioritised (urgent) CCE need, please provide the following information:*<br>*1. **The need:** Type of activity (e.g. replace obsolete CCE, extend CCE to unequipped facilities, etc.); specific CCE site (facility); type of equipment required; quantity of equipment items.*<br>*2. **Justification:** Reasons for urgent need (e.g. low CCE and/or immunisation (Penta3) coverage area, gender barriers, mobile population, etc.); current CCE and immunisation (Penta3) coverage in the population area.*<br>*3. **Expected outcome:** Anticipated increase in CCE and immunisation coverage (Penta3); anticipated progress against identified inequity (describe, in alignment with country Performance framework).*<br>*4. **Total CCE budget:** includes Gavi and country joint investment share* | |
| ***Prioritised (Urgent) CCE Need #1*** | |
| **The need** | 1146 CCE (SDD and ILR) Addressing access limitation to immunization service in four developing Regional states: Somali, Afar, Benishngul Gumuz & Gambella). |
| **Justification** | Areas of low coverage (9-65% lower than other areas) which are situated in the hard to reach areas with pastoral and nomadic communities |
| **Expected outcome** | Proportion of woredas with Penta 3 greater equal to 80% will increase to 80% from 30% in 2015(JRF reference #19 ) in the CCEOP 5-year implementation period |
| **Total CCE budget** | USD 5,934,598 |

| *Prioritised (Urgent) CCE Need #2* | |
|---|---|
| **The need** | 677 CCE (SDD, ILR and Arktek) addressing regional disparity in equity and coverage among regions in pastoral areas of Agrarian Regions: Oromia: Borona , Guji, West Guji,and Bale zone; SNNPR: South Omo zone, Bench Maji Zone |
| **Justification** | Areas of low coverage (9-65% lower than other areas) which are situated in the hard to reach areas with pastoral and nomadic communities |
| **Expected outcome** | Proportion of woredas with dropout rate of >10% will decrease to 10% from the current 24% in pastoral zones of Agrarian regions in the CCEOP 5-year implementation period. |
| **Total CCE budget** | **USD 3,396,752** |
| ***Prioritised (Urgent) CCE Need #3*** | |
| **The need** | **387** CCE (SDD and ILR) for all Rural District with less than 80% coverages: 211 districts with low immunization coverage according to the 2015 JRF data (reference #19) |
| **Justification** | Low coverage |
| **Expected outcome** | Proportion of woredas >=80% in woredas that are currently below 80% will increase to 80% from the current 0% in those woredas in the CCEOP 5-year implementation period |
| **Total CCE budget** | USD **1,856,366** |
| **GRAND TOTAL CCE BUDGET: Initial support (Years 1 and 2 )** | **USD 11,188,598** |

**10. Summary of INITIAL SUPPORT PHASE replacement/rehabilitation, expansion and extension plan**

*All countries must fill this section to highlight the number of equipment and corresponding number of sites these equipment will serve to meet their replacement/rehabilitation, expansion and extension targets. See Section 6.2 of the CCE optimisation Platform Guidelines for the definitions of replacement/rehabilitation, expansion and extension. The values entered below must align with those in Section 9 above and in other parts of the application form.*

| **Replacement/Rehabilitation** | | | | **Expansion** | | **Extension** | |
|---|---|---|---|---|---|---|---|
| Existing sites with (non)functional and/or obsolete non-PQS equipment to be replaced with platform-eligible ILR, SDD or long-term passive devices (including equipping sites with a larger equipment) | | Existing sites with (non)functional and/or obsolete PQS equipment to be replaced with platform-eligible ILR, SDD or long-term passive devices (including equipping sites with a larger equipment) | | Equipping existing sites with ADDITIONAL pieces of equipment for new vaccine introduction and/or to serve an increasing population | | Equipping previously unequipped sites (providing immunisation services or not, including existing sites without active devices) and add new service sites | |
| *No of Equipment* | *No of sites* | *No of Equipment* | *No of sites* | *No of Equipment* | *No of sites* | *No of Equipment* | *No of sites* |
| | | | | | | | |
| 347 | 347 | 775 | 775 | 15 | 15 | 1073 | 1073 |
| | | | | | | | |
| | | | | | | | |
| ***Total:347*** | ***Total:347*** | ***Total:649*** | ***745*** | ***Total 15*** | ***Total 15*** | ***Total: 1073*** | ***Total; 1073*** |

**11. Ongoing or planned activities around other supply chain fundamentals in the initial support phase**

| | |
|---|---|
| *In this section, linkages must be drawn between requested CCE Optimisation Platform support, on-going Gavi investments (especially through the Health Systems Strengthening support) and other partner supply chain support.*<br>*Describe planned or ongoing activities related to other supply chain fundamentals (see section 3.1 of the CCE Optimisation Platform Guidelines) during the initial support phase, including their sources of funding. Responses to this section should be linked to the EVM Improvement Plan.* | |
| **Supply chain managers**<br>*Describe all planned or ongoing activities related to improving the availability and performance of supply chain managers, their sources of funding, and partner support.* | The Ministry of Health (MOH) and its partners are working on multiple fronts to expand the capacity of supply chain managers and allocated funding to tackle the limited availability of health care workers.<br><br>The national logistics working group will continue to coordinate training for supply chain managers with financial support from FMOH and partners (UNICEF,CHAI, WHO, JSI-Deliver, and CSO). Special focus will be placed in CSO training to extend such training to health workers in hard to reach areas (Refer Detail activities discussed in the EVM improvement plan progress report). Over the period of CCEOP, training and development will continue with the financial source of GAVI-HSS-2. The capacity on HR will mainly focus on those hard to reach areas including districts and HFs and newly opened PFSA hubs which provide supply chain management in selected areas for initial phase support. |
| **Data for supply chain management**<br>*Describe all planned or ongoing activities related to data for management, their sources of funding, and partner support. In particular, provide information explaining how improvements to the functionality of logistics management systems will improve the visibility of up-to-date and accurate vaccine stock records at each level of the vaccine supply chain.* | To strengthen data management, FMHO is implementing the following major activities:<br><br>CCE Inventory data base:<br>FMOH developed and deployed window based CCEI application and in 2017 this application was already available in all regions, zones and about 40% districts. It will be fully in use in the first quarter of 2018.<br>Maintenance and spare part data base<br>FMOH in collaboration with CHAI is working to develop an updatable, real-time maintenance database extension for cold chain equipment inventory data base. This data base will trigger and track CCE inventory, spare parts consumption and resolve maintenance intervention. FMOH, CHAI as well as other donor partners will support the establishment and continue use of this data base.<br><br>Stock Data Management:<br>In order to monitor and track stock inventories at each level of the supply chain, PFSA is using the modern JSI/AIDSFREE project LMIS tool called HCMIS. A highly visible dash board representing on line information concerning stock levels, stock locations, historical consumption and future requirements. |

| | |
|---|---|
| | FMOH, PFSA, RHB, zonal and district supply chain managers will have ownership of the data. Those people will analyse, monitor, evaluate the data, share the data and take the decision. |
| **Optimised, efficient design of distribution system**<br>*Describe all planned or ongoing activities related to distribution system design optimisation, their sources of funding, and partner support.* | Ethiopia is currently in the process of optimizing its immunization supply chain system from a five-tier (national, regional, zonal, district (woreda), and health facilities) to a three-tier system (Regional hub, zonal and facility) with aim of integrating supply chain management of all health commodities under the mandate of a semi-autonomous body called PFSA.<br><br>To meet this objective, PFSA start to implement the initial phase in three selected PFSA hubs in 2014 (Mekelle, Bahir Dar and Jimma PFSA Hubs). Currently, PFSA hub is implementing transition in Gondar, Dessie, Negele Borena, Nekemtte, Assosa, Adama and Dire Dewa Hub). The transition will be extended in hard to reach areas with more newly PFSA hubs. In order to execute this activity, capacity building activities in human resource through trainings, procurement of CCE and , refrigerated truck and RTMDs. .<br><br>With GAVI support through the SDG-PF, additional procurement of refrigerated vehicles for delivery of vaccines in to the health facilities will be executed.<br><br>This redesign will enable to remove intermediary supply chain cold store, minimize the risk of stock handling in the intermediary store, reduce the warehousing costs and HR costs in the intermediaries. This will enable to build efficient supply chain system that can improve the availability, efficiency and potency of the vaccine delivered.<br><br>Financially the implementation of the transition plan is supported by FMOH, RHB, PFSA, JSI/AIDSFREE, UNICEF, CHAI WHO and other partners |
| **Continuous improvement process**<br>*Describe all planned or ongoing activities related to continuous improvement processes, their sources of funding, and partner support.* | The improvement in the supply chain is expected to improve vaccine distribution practices, immunization coverage and vaccine wastage rate. Moreover, it will improve the equity and quality in vaccine distribution which will avoid stock out of vaccine at health facilities.<br>To follow the proper execution of the transition plan, regular supportive supervision will be conducted by FMOH, PFSA and Partners. |

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| | To improve the sustainability of cold chain equipment maintenance, CCE maintainace topics have been incorporated in to the curricula of specific universities and colleges.<br><br>Moreover, Fridge tag data will be collected in a monthly basis from the 50 zones in a regular basis. Thee analysis will be made at FMOH and feedback will be given regularly. Moreover, supervisor at Districts are supposed to do the supervision and provide feedback.<br><br>In addition, RTMD is installed in all CRs and the cold rooms managers is taking a corrective action immediately. Currently, there is an effort to improve the data base system to be a web based system so that all EPI communities can have an easy access to it. |
| **Temperature monitoring**<br>*Describe the temperature monitoring devices that are currently available in the country? E.g. central level (CTMS), sub-national, lowest distribution and service delivery levels (30 DTRs and RTM devices), and during transportation (freeze tags).*<br>*Furthermore, describe which measures are in place to a) obtain temperature data from the various devices;*<br>*b) act following temperature alarms (curative maintenance);*<br>*c) in case of RTM devices, please elaborate on SOPs for each responder in the temperature monitoring system; and*<br>*d) countries wishing to purchase such devices are required to demonstrate how the recurrent costs, such as HR, data transmission, analysis etc., will be covered in this section.* | Following 2010 TMS, vaccine was exposed to freezing and heating. Following the study, 10,000 fridge tags (30 DTRs) have been introduced since 2012 and a training manual developed and training was given to all level EPI focal staff (health facility to regional health bureau).<br><br>There is an improvement in a temperature records, monthly review of temperature records by districts and daily follow up by HFs which enables for early remedial action on temperature excursions and heating. .<br><br>FMOH is also receiving Fridge-tag data from priority zones (51) and using analysed data (by area, type CCE, etc) for action. Currently, FMOH allocated budget for Fridge-tag replacement.<br><br>For those cold rooms (WICR) managing huge amount of vaccines RTMD procured, installed and respective technicians, cold store managers and supply chain managers are using to monitor their respective cold store temperatures. This escalate the maintenance need for early corrective maintenance. Separate SOP, which includes, selection of the device, temperature data recording, reporting, utilization of the data for action (including linking with CCE maintenance) for Temperature Monitoring and control system will be developed. |

## PART E: SCALE-UP SUPPORT PHASE

This second phase of Gavi CCE Optimisation Platform support (provided from approximately year 3 onwards) is designed to address additional CCE needs as part of optimising design and increasing the sustainability of the supply chain.

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| ☆ | Budgets are **not inclusive** of operational cost.<br>Operational costs must be financed by Ministry of Health or other partners. |

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| CCE | Further information on CCE rehabilitation and expansion plan, equipment selection and strategic deployment plan requirements is provided in Annex 3 of the CCE Optimisation Platform Guidelines, available at www.gavi.org/support/apply/ |

**12. Prioritised (Additional) CCE needs** *(Maximum 3 pages)*

*Provide information on **2 to 4 prioritised (additional) CCE needs** as identified in the 'CCE rehabilitation and expansion plan, equipment selection and strategic deployment plan requirements'.*

*For each prioritised (additional) CCE need, please provide the following information:*

1. ***The need:** Type of activity (e.g. replace obsolete CCE, extend CCE to unequipped facilities, etc.); specific CCE site (facility); type of equipment required; quantity of equipment items.*
2. ***Justification:** Reasons for urgent need (e.g. low CCE and/or immunisation (Penta3) coverage area, gender barriers, mobile population, etc.); current CCE and immunisation (Penta3) coverage in the population area.*
3. ***Expected outcome:** Anticipated increase in CCE and immunisation coverage (Penta3); anticipated progress against identified inequity (describe, in alignment with country Performance framework).*
4. ***Total CCE budget:** includes Gavi and country joint investment share*

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| | ***Prioritised (Additional) CCE Need #1*** |
| **The need** | 1,224 CCE (SDD, ILR, Arktek) for the remaining agrarian regions requiring CCE expansion and replacement Oromia (14 zones), Tigray (all) ,Amhara (all), SNNPR (13), Addis Ababa, Harari, Dire Dawa |
| **Justification** | Equipping health posts and centres with CCE, Capacity expansion for needs, replacement of obsolete and absorption equipment |
| **Expected outcome** | To Reach 80% coverage in these districts |
| **Total CCE budget** | **USD 5,262,251** |
| | ***Prioritised (Additional) CCE Need #2*** |
| **The need** | 2,588 CCE (SDD and ILR) for the remaining Health Posts based on geographic location, distance and population size priority will be given. |
| **Justification** | Rehabilitate existing CCE and increase equity |
| **Expected outcome** | To Reach 80% coverage in these districts |
| Total CCE budget | **USD 11,000,876** |
| | ***Prioritised (Additional) CCE Need #2*** |
| **The need** | **Procurement** of 2,210 units Fridge-Tag 2 E and Procurement of spare parts for 300 CCE to be procured in 2018 as part of ensuring the availability of spare parts. |

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| **Justification** | There will be about 2,210 units of Fridge- Tag2 E which will finish the battery its life-span after being procured in 2018 and used for 4.5 to 5 years. As all new CCE will be equipped in 2018, it is very important to consider the replacement n 2022. Besides, ensuring availability of spare parts timely will greatly contribute for timely intervention of maintenance. |
| **Expected outcome** | 2,210 Fridge- Tag2 E will be replaced and temperature monitoring will be continuous to ensure the monitoring of the storage temperature and the performance of the CCCE. Timely response to repair and maintenance. |
| Total CCE budget | USD 188,100 |
| **GRAND TOTAL CCE BUDGET: "Scale-up support" (Years 3, 4 & 5 )** | **USD 16,471,634** |

**13. Summary of SCALE-UP SUPPORT PHASE replacement/rehabilitation, expansion and extension plan**

*All countries must fill this section to highlight the number of equipment and corresponding number of sites these equipment will serve to meet their replacement/rehabilitation, expansion and extension targets. See Section 6.2 of the CCE optimisation Platform Guidelines for the definitions of replacement/rehabilitation, expansion and extension. The values entered below must align with those in Section 9 above and in other parts of the application form.*

| **Replacement/Rehabilitation** | | | | **Expansion** | | **Extension** | |
|---|---|---|---|---|---|---|---|
| Existing sites with (non)functional and/or obsolete non-PQS equipment to be replaced with platform-eligible ILR, SDD or long-term passive devices (including equipping sites with a larger equipment) | | Existing sites with (non)functional and/or obsolete PQS equipment to be replaced with platform-eligible ILR, SDD or long-term passive devices (including equipping sites with a larger equipment) | | Equipping existing sites with ADDITIONAL pieces of equipment for new vaccine introduction and/or to serve an increasing population | | Equipping previously unequipped sites (providing immunisation services or not, including existing sites without active devices) and add new service sites | |
| *No of Equipment* | *No of sites* | *No of Equipment* | *No of sites* | *No of Equipment* | *No of sites* | *No of Equipment* | *No of sites* |
| | | | | | | | |
| 345 | 345 | 2281 | 2281 | 45 | 45 | 941 | 941 |
| | | | | | | 200 Arktek-YBC-5 | 200 |
| | | | | | | | |
| ***Total:345*** | ***Total:345*** | ***Total:2281*** | ***Total:2281*** | ***Total*** | ***Total*** | ***Total: 1141*** | ***Total:1141*** |

| 14. Ongoing or planned activities around other supply chain fundamentals in the scale-up support phase | |
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| *In this section, linkages must be drawn between requested CCE Optimisation Platform support, on-going Gavi investments (especially through the Health Systems Strengthening support) and other partner supply chain support.*<br>*Describe planned or ongoing activities related to other supply chain fundamentals (see section 3.1 of the CCE Optimisation Platform Guidelines) during the scale-up support phase, including their sources of funding. Responses to this section should be linked to the EVM Improvement Plan.* | |
| **Supply chain managers**<br>*Describe all planned or ongoing activities related to improving the availability and performance of supply chain managers, their sources of funding, and partner support.* | The FMOH has been working in collaboration with partners to strengthen the supply chain system of the country to avail safe and lifesaving vaccines. To achieve this objective the FMOH will implement new initiatives by incorporating lesson learned from CCEOP initial phase.<br>Supply chain management has been going for a long period of time and will continue during the time line of CCEOP. And it will continue to be supported by PFSA supply chain expertise. The national logistics working group coordinated this training effort and financial support will be provided by FMOH and partners (CHAI, WHO, JSI-Deliver, and UNICEF). (Refer Detail activities discussed in the EVM improvement plan progress report). Over the period of CCEOP, training and development will continue with the financial source from SDG-PF or GAVI-HSS-3. |
| **Data for supply chain management**<br>*Describe all planned or ongoing activities related to data for management, their sources of funding, and partner support. In particular, provide information explaining how improvements to the functionality of logistics management systems will improve the visibility of up-to-date and accurate vaccine stock records at each level of the vaccine supply chain.* | The rollout of all the databases mentioned in Section 11 which will improve data visibility will be completed. Upon completion, these will be evaluated and further activities will be determined as necessary. No activities are planned currently. |
| **Optimised, efficient design of distribution system**<br>*Describe all planned or ongoing activities related to distribution system design optimisation, their sources of funding, and partner support.* | The PFSA distribution transition is expected to be completed in the initial phase. The performance of this design will thereafter be evaluated and improvement activities will be planned accordingly. |
| **Continuous improvement** | Increase regular supportive supervision will be conducted by |

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| **process**<br>*Describe all planned or ongoing activities related to continuous improvement processes, their sources of funding, and partner support.* | FMOH, PFSA and Partners to support the continuous improvement process of the vaccine supply chain logistics.<br>To improve the long term sustainability of cold chain equipment maintenance, CCE maintenance topics have been incorporated in to the curricula of Biomedical Engineers and Biomedical technicians at specific universities.<br>PFSA continuously do routine delivery route analysis to improve their efficiency. This causes a continuous improvement process in the supply chain management.<br>In addition, FMOH will implement new initiatives by incorporating lesson learned from CCEOP initial phase. |
| **Temperature monitoring**<br>*Describe how the temperature monitoring system will evolve? Which devices will be used?*<br>*Furthermore, describe which measures are in place to*<br>*a) obtain temperature data from the various devices;*<br>*b) act following temperature alarms (curative maintenance);*<br>*c) in case of RTM devices, please elaborate on SOPs for each responder in the temperature monitoring system; and*<br>*d) countries wishing to purchase such devices are required to demonstrate how the recurrent costs, such as HR, data transmission, analysis etc., will be covered in this section.* | During the scale up phase, the country expects 100 % of HF to be equipped with 30 DTR and 100% of WiCR to be equipped with RTMDs. Thus 100% of facilities will have aprppriate type of technologies. The focus of Temperature Monitoring activities during this phase is expected to be improvement of linkage with the maintenance system to increase uptime of CCE and reduce damage to vaccine stocks. These activities will be planned and funded by FMOH and partners. |

## PART F: BUDGET TEMPLATES

This section details the number of requested equipment items and equivalent budget. A maximum investment amount (and indicative number of equipment items) corresponding to the phased support request will be considered for recommendation of approval by the IRC and subsequent decision by Gavi.

However, in consultation with the Secretariat and in-country partners, the number of equipment items may be modified when the detailed operational plan is developed subsequent to the Platform proposal and the support may vary within the limit of the approved maximum amount.

Budgets must be completed in the attached budget template, and with reference to the ***CCE Optimisation Platform Guidelines, Gavi CCE Optimisation Platform Technology Guide and CCE planning prices and Total Cost of Ownership (TCO) analysis tool.***

**15. CCE Optimisation Platform - Budget Template**

*To be filled by **ALL** countries after selection of equipment that best suit their CCE needs (e.g. specific model and make).*

*Countries will plan with indicative PQS prices and corresponding service bundle estimates (depending on equipment being on/off-grid and estimated costs of service bundle).*

*Planning price ranges are provided in this template.*

*How to fill the attached budget template: Countries should:*

- *Select appropriate 'Equipment Model' against the listed equipment types*
- *Fill out the 'Estimated service bundle cost' and 'Number of equipment' requested*
- *(In the last 'Total CCE OP Request' table), fill out second and third preference for each model selected. The second and third preference should be comparable products in the same capacity segment.* **Countries are informed that Gavi, and its Alliance partners principally UNICEF, will try as much as possible to respond to countries' first preference, but manufacturers' lead time could also lead to countries receiving cost estimates for either their second or third preference.**

**Completed budget template should be sent as an attachment along with application form.**

**Budgeting for Buffer and Procurement fees**

- *Buffer fees: A 7% buffer on **total equipment cost** is built into country yearly budgets. This will cover currency variations, demurrage and associated costs and will be returned to country, if unused.*
- *Procurement fees: Countries will also need to **pay UNICEF's procurement costs for the country joint investment portion**, estimated to be up to 8.5%. Please obtain actual amounts from the UNICEF country office..*

## PART G: PERFORMANCE FRAMEWORK

Countries must include **CCE Optimisation Platform indicators** in the application. The indicators need to be included in the Performance Framework for the current and/or proposed Gavi HSS support, after Platform proposal approval.

According to their specific context, countries are required to consider the most appropriate data sources to report on programme implementation and progress against the targets set. This should be discussed with partners (which may provide technical assistance) and the Gavi Secretariat.

Programmatic reporting updates, as well as targets and indicator updates, will be made as part of the Gavi performance framework and annual Joint Appraisal process. Countries are expected to consider relevant smart indicators to be monitored and reported against, in terms of intermediate results or outcomes/impact.

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| CCE | Further information on developing relevant indicators, including a list of possible data sources, is provided in Section 7.2 of the CCE Optimisation Platform Guidelines, available at www.gavi.org/support/apply/ |

| **16. Indicator monitoring and reporting requirements** |
|---|
| *As a **minimum**, countries need to monitor and report on:*<br>• ***5 MANDATORY intermediate results indicators;***<br>• ***1 MANDATORY intermediate result indicators if countries are procuring User independent freeze protected cold boxes and vaccine carriers; and***<br>• ***1 to 3 ADDITIONAL intermediate results indicator(s).*** |
| *1)* ***CCE Replacement/Rehabilitation in existing equipped sites**: Percentage of existing sites with (non)functional and/or obsolete non-PQS and PQS equipment to be replaced with platform-eligible ILR, SDD or long-term passive devices (including equipping sites with a larger equipment)*<br>*2)* ***CCE Expansion in existing sites:** Percentage of existing sites being equipped with ADDITIONAL pieces of equipment for new vaccine introduction and/or to serve an increasing population;*<br>***3. CCE Extension in unequipped existing and in new sites:** Percentage of previously unequipped sites (providing immunisation services or not, including existing sites without active devices) and new service sites being equipped with Platform eligible equipment.*<br>***4. CCE maintenance :** Well-defined indicator proposed by country to reflect appropriate maintenance of equipment; for example percentage of* |

*equipped facilities with functioning cold chain,[3] such as demonstrated by remote temperature monitoring;* ***and***

3) ***5. Freeze-free to non-freeze-free carrier ratio:*** *Ratio of freeze-free cold boxes/carriers to non-freeze-free cold boxes/carriers in-country?*

***USE THE TABLE BELOW TO COMPLETE MANDATORY INDICATORS***

| ***Indicator*** *(Provide name of the mandatory indicator as shown above)* | ***Definition*** *(Provide definition if not already specified)* | ***Data Source*** *(identify data source)* | ***Reporting frequency*** *(annual, semi-annual, quarterly etc.)* | ***Baseline (Year)*** *(Provide numerator and denominator for calculating percentage)* | ***Target Year 1*** *(Provide numerator and denominator for calculating percentage)* | ***Target Year 2*** *(Provide numerator and denominator for calculating percentage)* | ***Target Year 3 (If applicable)*** *(Provide numerator and denominator for calculating percentage)* |
|---|---|---|---|---|---|---|---|
| *1.* ***CCE Replacement/rehabilitation in existing Equipped sites*** | *Percentage of existing sites with (non)functional and/or obsolete non-PQS and PQS equipment to be replaced with platform-eligible ILR, SDD or long-term passive devices (including equipping sites with a larger equipment)* | *CCEI* | *Annual* | *Numerator = 4,604*<br>*Denominator= 6,770*<br>*Percentage= 68 %* | *Numerator = (4604-561)=4043*<br>*Denominator= 6,770*<br>*Percentage=59.4%* | *Numerator: (4043-561=3482*<br>*Denominator= 6,770*<br>*Percentage=%* | *Numerator = (3482-2626=856*<br>*Denominator= 46,770*<br>*Percentage=14%* |
| *2.* ***CCE expansion in existing equipped sites:*** | *Percentage of existing sites being equipped with ADDITIONAL pieces of equipment for new vaccine introduction and/or to serve an* | *NA* | | | | | |

[3] **Indicator definition**: *% CCE functioning = (# functioning CCE devices) / (total # of CCE devices designated for use)*. CCE devices considered for this indicator include all refrigerators, fixed passive storage devices, walk-in cold rooms and freezers designated for string vaccines. Both the numerator and denominator should be collected from the same geographical area / period in time and should not include decommissioned equipment. Functionality of CCE is broadly defined to mean that the device is operable at a particular point in time for storing vaccine.

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| | *increasing population;* | | | | | | |
| *3.. CCE extension in unequipped existing and/or new sites:* | *Percentage of previously unequipped sites (providing immunisation services or not, including existing sites without active devices) and new service sites being equipped with Platform eligible equipment.* | *CCEI* | *Annual* | *Numerator = 0*<br>*Denominator= 9172*<br>*Percentage=17* | *Numerator = 535-*<br>*Denominator= 9172*<br>*Percentage=5.8%* | *Numerator = 605 535+532*<br>*Denominator=9172*<br>*Percentage=11.6%* | *Numerator = 1,973 = 1141+535+532*<br>*Denominator=9172*<br>*Percentage=24* |
| *4.* ***CCE maintenance*** | *Percentage of cold chain equipment functional*<br>*(based on the updated CCI report)* | *CCEI* | *Annual* | *Numerator =5732*<br>*Denominator=6770*<br>*Percentage=85* | *Numerator =1281*<br>*Denominator=14312*<br>*Percentage=90* | *Numerator =14302*<br>*Denominator=15166*<br>*Percentage=95* | *Numerator =15327*<br>*Denominator=16077*<br>*Percentage=96* |
| *.* ***Freeze-free to non-freeze-free carrier ratio*** | *Ratio of freeze-free cold boxes/carriers to non-freeze-free cold boxes/carriers in-country* | *N/A* | | | | | |

***ADDITIONAL intermediate results indicator(s):*** *Countries are required to suggest 1 to 3 intermediate results indicators to track performance of rehabilitation, expansion, maintenance and/or other supply chain fundamentals (include baseline, data source, targets and frequency of reporting).*

***Examples*** *of additional intermediate results indicators options are:*

1. ***Functional status of cold chain equipment****: Ratio of functional CCE and ratio of districts with at least 90% functional equipment;*
2. ***Closed vial wastage****: Rate at a national, district and facility level;*
3. ***Forecasted demand ratio****: Ratio of actual usage compared to forecast (vaccines);*
4. ***Full stock availability:*** *Ratio of facilities/districts without any stock out;*
    a. *Stocked according to plan: Percentage of facilities/stores/districts that have stocks levels between set minimum and maximum stock levels;*
5. ***Temperature alarms:*** *Frequency and magnitude of heat and cold alarms per monitoring period (i.e., temperature excursion) and number of CCE devices with more than a certain level of temperature excursion;*
6. *Rate of health facilities dashboard use, timely analysis and use for decision making;*
7. ***On-time and in-full (OTIF) delivery****: Ratio of order completely delivered on time;* ***or***
8. *Number of health managers trained and despatched for supply chain oversight function and rate of reported monitoring activities.*

***USE THE TABLE BELOW TO COMPLETE ADDITIONAL INDICATORS***

| ***Indicator*** *(Provide name of the* ***additional*** *indicators as shown above)* | ***Definition*** *(Provide definition if not already specified)* | ***Data Source*** *(identify data source)* | ***Reporting frequency*** *(annual, semi-annual, quarterly etc.)* | ***Baseline (Year)*** *(Provide numerator and denominator for calculating percentage)* | ***Target Year 1*** *(Provide numerator and denominator for calculating percentage)* | ***Target Year 2*** *(Provide numerator and denominator for calculating percentage)* | ***Target Year 3 (If applicable)*** *(Provide numerator and denominator for calculating percentage)* |
|---|---|---|---|---|---|---|---|
| *1.* Temperature alarms | *temperature excursion and number of CCE devices with more than two of temperature excursion;* | *TMS* | *Annual* | *10%* | *8%* | *6%* | *5%* |
| *2.Optimality of the cold chain* | *Percentage of all cold chain equipment that are optimal and meet GAVI CCEOP criteria * (based on the currently updated CCI report)* | *CCEI* | *Annual* | *Numerator=1141*<br>*Denominator=20,934*<br>*Percentage= 6%* | *Numerator=1141+8000+2210*<br>*Denominator=20934*<br>*Percentage= 54%* | *Numerator=1141+8000+2210+1244Denominator=20,934*<br>*Percentage= 60* | *Numerator=1141+8000+2210+1224+2588*<br>*Denominator=20934*<br>*Percentage=72* |
| | | | | | | | |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| *Add more indicators HERE if needed.* | | | | | | | |