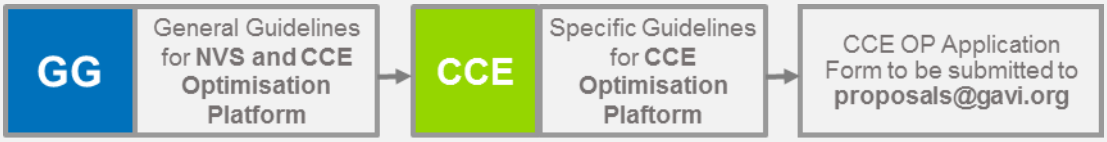
Application Form for
Cold Chain Equipment Optimisation Platform
support in May-June 2017 only

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 (Columns CA and CB).

CONTENTS

PART A: APPLICANT INFORMATION

1. Applicant information	
Country	BENIN
Date	12 October 2017
Contact name	Franck Hilaire BETE, *Director General of the National Agency for Immunization and Primary Health Care (ANV-SSP)*
Email address	franckbete@gmail.com ou fbete@yahoo.fr
Phone number	(+229)97645912
Total funding requested from CCE Optimisation Platform **(US $)**	*This should correspond exactly to the budget requested in the embedded template.* **US $4,208,988** • **Gavi: 3,367,190 $US** • **Country (current HSS): 841,798 $US**
Does your country have an approved Gavi HSS support on-going?	Yes [X] No [ ] *Indicate the anticipated **final year** of the HSS: **2018***
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: **October 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: **August 2020***
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 (or delegated authority)** Name: Allassane SEIDOU — Name: Romuald WADAGNI Signature: — Signature: Date: — Date: **b. ICC Members of the EPI Benin:** Date: — Date:

EXECUTIVE SUMMARY

Benin has a surface area of 114,763 km² that extends from Niger in the north to the Atlantic Ocean in the south. It is bordered to the northwest by Burkina Faso, to the west by Togo and to the east by Nigeria. It has three climate zones:

- the dry tropical climate of the north has a dry season and a rainy season.
- the Guinean-Sudanese climate zone in the centre of the country has tropical semi-humid conditions
- the tropical humid climate of the South, which has two rainy seasons (April - June and September - October) and two dry seasons (July - August and November - March).

In 2015, Benin was 140th out of 198 countries in terms of national revenue, and the per capita GDP was US$ 708,98, or FCFA 354,500.

In 2017, the population is estimated at 11,485,270 with 418,064 expected births. Mortality is estimated at 96,591 children, or 23% of the birth cohort. The 321,473 surviving children represent 2.79% of the total population. The 2,744,979 women of child-bearing age represent 24% of the population. The table below shows the country's principle socio-demographic indicators.

Indicators	***Amount***
Gross birth rate (TBN)	*36.4‰*
Gross mortality rate (TBM)	*8.5‰*
Infant Mortality Rate (IMR)	*68.1‰*
Under-five mortality rate	*41‰*
Ratio of maternal mortality (TMM)	*335.5 deaths per 100,000 live births*
Life expectancy at birth	*60.26 years*
Synthetic fertility index (ISF) woman	*4.8 children per woman*
Rate of growth	*3.5%*

Benin has 12 administrative departments which are: Atacora, Donga, Borgou, Alibori, Zou, les Collines, Mono, Couffo, Atlantique, Littoral, Ouémé, and Plateau. There are 77 communes, 546 *arrondissements* and 5,290 villages or city neighbourhoods (*see Map Chapter 1 - Single Document)*.

Benin has 12 health departments, 34 health zones, 85 EPI communes and 904 health centres that provide immunisation services. Government allocations for the health sector went from CFA 71.757 billion in 2013 to CFA 69.582 billion in 2016. And, the 2017 budget has an allocation of CFA 81 billion for the health sector.

Benin is fully committed to the Millennium Development Goals. As such, the NHDP and the cMYP set their objectives within this context. However, their implementation has not been as rapid as hoped due to a lack of financial, human and material resources (Chapter 4.2 of the single document).

The 2014 external EPI review showed BCG coverage at 98% (scar) and a rate of 76% of children fully immunised (health card + history). WHO-UNICEF estimates DTP-Hib-HepB3 coverage at less than 85% (78% in 2014 and 82% in 2015 and in 2016). There is a clear difference between the administrative immunisation rate and the actual immunisation rate, due to difficulties with organisation and monitoring.

Benin follows the vaccine introduction programme recommended by WHO and Gavi, and plans to introduce the MR and rota vaccines and HepB vaccine at birth into its routine EPI. The vaccine for uterine cancer, the human papilloma virus (HPV), has already been in demonstration phase in two health zones since 2016. These programmes affect CCE needs.

It should be said that there is no disparity linked to gender with regard to immunisation in the country. The 2014 external EPI review and the 2014 MICS survey both confirmed this. However, there are geographic, social and economic disparities.

Geographically, only eight (8) communes out of 85 have at least 80% of children fully immunised, while in the lowest-performing 14 communes, the rate of children who are fully immunised is less than 50%. This is due to the lack of CCE or the state of existing CCE and challenges within the cold chain. Socially, the poorest classes experience an immunisation coverage rate that is much lower. This is due to household health expenditures contributing 52% of the health budget and cultural reticence toward immunisation.

The 2012 EVM assessment revealed various problems such as the quality and distribution of cold chain equipment as well as the operation of the cold. The programme to implement EVM has brought with it true improvements that were, however, impeded by financial limitations due to restrictions from the NHDP and the difficulties finding, keeping and training competent personnel. In September 2017, the country, with the support from its partners, proceeded with the implementation of a new EVM assessment in order to identify areas for improvement to be made to the supply chain.

Within the framework of the 2012 EVM recommendations, the country acquired four (4) cold rooms with a gross total volume of 160 m^3, renovated the transport chain with new distribution vehicles, implemented the use of continuous temperature recorders and began a “redesign:” process for the supply chain at the operational level using the deployment of an optimised logistics system based on a “push” model.

Despite this, CCE was not replaced and out of 1,525 pieces of equipment identified in 2016, 270 refrigerators in use have not been pre-qualified (are for domestic use only) and 868 are absorption refrigerators. In addition, 52% of the equipment inventoried is more than ten (10) years old and in the next five (5) years, more than 70% of the cold chain equipment fleet will be obsolete.

Implementation of the health system, in compliance with WHO requirements, is in progress. Significant efforts have been made in all areas, but bring the CCE fleet into compliance was not addresses in recent years due to the fact that it was functionally well for the most part and also to the large financial cost of doing so. Bringing the fleet into compliance (replacing obsolete, non-compliant or non-operational CCE) and the acquisition of additional equipment for centres lacking CCE is now considered necessary and urgent. This will allow for sustainable efforts to be taken with regard to the country’s health system.

That is the purpose of this proposal: to have an agreement with WHO and Gavi with the objective of allowing the national health system to reach a new level of quality and, more specifically, to respond to EVM requirements to improve geographic coverage, cold chain reliability and efficiency and the availability of high-quality vaccines. Finally, changes in the CCE fleet will enable improvements to geographic and social equity.

The CCE replacement and acquisition project has been planned and implementation conditions have been established in all areas. Coverage objectives have been established and these were used to evaluate 2018-2022 needs using the EPI_LOG_Forecasting Tool and the inventory and gap analysis tool. Deployment priorities have been established while taking the principles of equity and efficiency into account.

The country has obtained support from some of its partners in order to initiate the renewal of several items of equipment. Furthermore, the opportunity to get support for the introduction of a new vaccine in the particular case of the RR vaccine has been taken to plan an order for several items of cold chain equipment.

Therefore, the funding requested via the Cold Chain Equipment Optimisation Platform (CCEOP) is to satisfy needs not yet covered by the purchase and installation, over a two-year period, of: 704 refrigerators (451 B Medical TCW 40R SDD, 192 B Medical TCW 2000 AC and 61 Vestfrost VLS 350A).

80% of the total funding amount of **US$ 4,208,988** will be provided by Gavi funds and 20% will be provided by the country using current HSS funds.

The acquisition of the new cold chain equipment (CCE) will enable a high-performing de maintenance programme to take hold, by standardising processes, and enabling reliable reporting and an appropriate and optimised distribution programme.

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	27/04/2017	-	
2	Minutes of the Coordination Forum meeting (ICC, HSCC or equivalent) endorsing the proposal[1]	Yes	12/10/2017	-	
3	National Health Sector Development Plan	Yes	09/01/2009	2009-2018	
4	cMYP	Yes	12/10/2016	2014-2018	
5	EVM Assessment	Yes	17/09/2012	2012-2017	
6	EVM Improvement Plan	Yes	5/12/2012	2012-2017	
7	EVM Annual Workplan **and** Progress Report on EVM Improvement Plan[2]	Yes	27/04/2017		
8	WHO CCEI Tool/UNICEF IMT/PATH CCEM Tool/CHAI tool[3,4]	Yes	26/07/2017	2016-2017	
9	Inventory Report and Facilities segmentation	Yes	26/08/2017	2016-2017	
10	Single document: Chapter 1: Cold Chain Rehabilitation and Expansion Plan Chapter 2: Projected Coverage and Equity Improvements Chapter 3: Strategic Deployment Plan Chapter 4: Equipment Selection	Yes	12/10/2017	2017-2022	
11	Maintenance Plan with financing and source(s)	Yes	07/09/2017	2017-2022	
12	Proof of status for CCE tariff exemptions waiver	Yes	12/08/2008	Just a revision	✓ Memorandum of Understanding with

[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.
[3] The CCE Inventory must have been updated within no more than one (1) year of applying for Platform support.
[4] **Tool should allow reviewers to understand targeting of equipment to locations relative to contribution towards improving coverage and equity of immunisation.**

2. Mandatory attachments					
No.	**Strategy / Plan / Document**	**Attached Yes/No**	**Final version (dated)**	**Duration**	**Comments**
					UNICEF (MOU) ✓ Customs exemption documents for vaccines and other materials (consumables, CEF) acquired for the ANV-SSP (Request for waiver of customs duties, Certificate of donation, Authorization procedures simplified and exemptions from duties and taxes)
13	Terms of Reference for the relevant Coordination Forum (such as ICC) including all sections outlined in Section 5.2 of the General Application Guidelines	Yes	14/10/2005	Just a revision	
14	Minutes of the Coordination Forum meetings from the past 12 months before the proposal	Yes	NA	NA	
15	Other relevant documents	Yes	-	-	✓ External Review Report EPI 2014 ✓ EDS Report 2012 ✓ Memorandum No. 144/MS/ANV-SSP/DLOG/SA to set up the Committee responsible for coordinating the submission of the Cold Chain Equipment Optimisation Platform (CCEOP) bid ✓ Minutes of the Meeting of GTCL of 22/05/2017

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 refer to the relevant sections of the documents above as often as possible.

The Benin government is committed to protecting vulnerable individuals against vaccine-preventable diseases through the Expanded Programme on Immunisation (EPI). This programme is implemented by the National Agency for Immunisation

and Primary Health Care (ANV-SSP). This commitment is clearly addressed in the various plans **(2009-2018 NHDP, 2014-2018 cMYP and AWPs**). This ambition is strengthened by the **Government Action Programme (2016-2021 PAG)** that focuses on "relaunching Benin's economic and social development in a sustainable way". This goal is translated into permanent research on full and correct immunisation for targets (children under five (5) years of age, pregnant women, others) via implementation of a high-performing EPI. Vaccine independence for the country via regular payment for traditional vaccines as well as the co-funding of new vaccines constitutes a victory for improving the population's health. All these efforts by the country must be consolidated through the availability of equipment appropriate for use in the immunisation system, to guarantee vaccine quality.

The National Health Development Plan (NHDP), which is a reference document on matters of health development in the country, identifies vaccination activities as a priority. The NHDP is articulated around five priority areas, the first of which is entitled *"Preventing and fighting against disease and improving health care quality*". It is within the NHDP's sub-programme 2 that attention was given to immunisation activities and they were developed (Pages 41-42).

In the next version of the NHDP (2017-2021), which is currently being finalised, an important emphasis was given to the permanent availability of vaccines and medical supplies (pages 67-68).

The Comprehensive Multi-year Plan for immunisation (2014-2018 cMYP) defines seven (7) priorities: *i) programme management; ii) human resources management; iii) calculation of costs and funding; iv) vaccine supply, analysis and logistics; v) immunisation services; vi) surveillance and reporting; and vii) demand generation and communication*. In cooperation with the NHDP, the cMYP defines strategies for combating infant and child mortality, various organised immunisation sessions (fixed and outreach strategies) as well as the Reach Every District (RED) approach. Renovating cold chain equipment is addressed in the 2014-2018 cMYP in Chapter IV.3 Priorities in table 28: Priority phases and national objectives 111 and 112.

The various annual work plans (AWPs) for the ANV-SSP are integrated with the vaccine logistics through equipment maintenance, optimisation of the supply chain, supportive supervision, and the strengthening EPI management capacity at all levels of the health care system.

Despite all the goals expressed in these programming documents and the implementation taking place at all levels of the health care system, several problems affect the immunisation system's performance. The exhaustive 2016 inventory showed that 24% of health facilities do not have cold chain equipment. For those that do have CCE, 83% of the equipment does not comply with WHO standards and this significantly compromises the quality of vaccines administered to the targets.

The country, however, has undertaken initiatives within the framework of optimising its vaccine logistics system (DSLO). Currently, 16 health zones (Comé-Bopa-Houéyogbé-Grand Popo, Lokossa-Athiémé, Aplahoué-Djakotomey-Dogbo, Klouékanmey-Toviklin-Lalo, Banikoara, Malanville-Karimama, Kandi-Gogounou-Ségbana, Tchaourou, Kérou-Kouandé-Péhunco, Sakété-Ifangni, Covè-Zagnanado-Ouinhi, Zogbomey-BohiconZakpota, Djougou-Copargo-Ouaké, Bassila, Allada-Toffo-Zè, Djidia-Aborney-Agbangnizoun) are implementing logistics optimisation (DSLO) to ensure the availability of high-quality vaccine inputs at service locations. The goal of the initiative is to extend to all the country's health zones by 2020 (see single document - Overview - pages 15-16).

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)*

The challenge of the Benin EPI cold chain is becoming more and more of a national preoccupation. To better understand it, an exhaustive inventory was conducted in September 2016 and it took all levels of the entire health system into account. The conclusions from this inventory allowed Benin to submit a proposal for assistance in improving the EPI cold chain.

Within the framework of this proposal, the Director General of the ANV-SSP created a process coordinating committee using service note no. 144 /MS/ANV-SSP/DLOG/SA from 28 February 2017 (see annex documents). The committee's first activities were to organise meetings for planning and standardising the design stages of the various parts of the application, in compliance with the established schedule. These meetings include the ANV-SSP's technical directorates and representatives from financial and technical partners (AMP, UNICEF, WHO).

After this phase, the various plans required to submit the application are to be finalised by those involved in the ANV-SSP in cooperation with the Ministry of Health's other directorates (DIEM, DPP) and other levels within the health care structure under the supervision of members of the Technical and Coordinating Logistics Group (GTCL) and the National Advisory Committee on Vaccines and Immunisation (CNCV-Benin).

The GTCL is a logistics sub-committee of the ICC and it has been very active since 2014 in implementing the deployment of optimised logistics system (DSLO) with the support of various partners. It meets once a month and, each year, holds a results workshop to assess the level of implementation for its work programme. The GTCL has met regularly and addressed the problem of a quality cold chain in Benin in all its meetings as well as the actions taken to support the country's efforts to rehabilitate the EPI cold chain equipment and submission of the CCEOP.

The group of CSOs, including the EPI Foundation and the platform for Civil Society for Immunisation, have also contributed to designing various plans within the CCEOP proposal framework.

These various documents were presented to the ICC which gave its approval for the proposal during its ordinary session on 27 April 2017. The recommendations from WHO's pre-review on 15 May 2017 were addressed and during its meeting of 22/05/2017, the GTCL validated the amended version of the proposal.

In July 2017, the GAVI Independent Review Committee reviewed the document and developed a recommendation for a new submission. The country team took into account all the preoccupations of the Independent Review Committee and prepared a new document which was reviewed once again by WHO's pre-review Committee on 17 May 2017. Observations made by

the WHO pre-review Committee have all been integrated. In the meantime, from 25 July to 4 August 2017, the members of the team for the coordination of the bid submission participated in the peer review workshop to review country documents accompanying the submission of the GAVI CCEOP bid, which was held at Cotonou in Bénin. The country has also obtained some technical assistance within the framework of this submission, in this case, from WHO, UNICEF and AMP.

The validated and amended version of the submission was presented to the ICC during its third Ordinary Meeting on 12 October 2017.

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?

a) Vaccine supply chain

The annual vaccine needs are estimated by the government through ANV-SSP with the technical assistance of UNICEF who programmes the orders according to regular supply mechanisms.

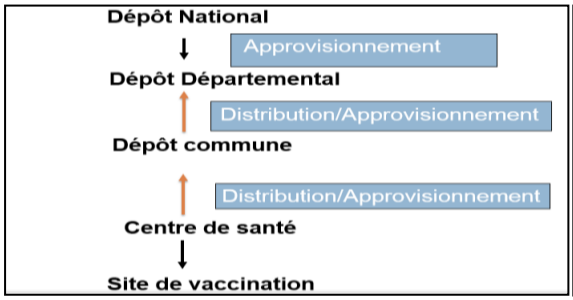
The national level is supplied every 6 months via UNICEF supply chain. Once received, the vaccines are stored in cold rooms at the national storage facility and distributed on a quarterly basis to the departments.

The departmental level serves as the intermediate vaccine and supply storage facility for the communes. The national storage facility delivers vaccines to the departmental storage facilities in refrigerated vehicles. The departmental storage facilities deliver vaccines and supplies to the peripheral storage facilities (zones and communes).

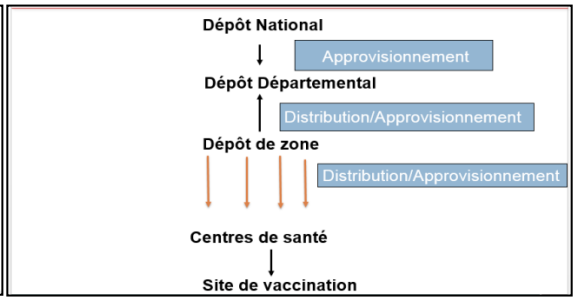
According to the health care structure in Benin, **the health zone level** should represent the last level for the distribution of vaccines. However, in reality, this is not the case. There is no vaccine storage facility at the country's health office level except for the 16 health zones using the optimised logistics system (DSLO) approach; these are Comé-Bopa-Houéyogbé-Grand Popo, Lokossa-Athiémé, Aplahoué-Djakotomey-Dogbo, Klouékanmey-Toviklin-Lalo, Banikoara, Malanville-Karimama, Kandi-Gogounou-Ségbana, Tchaourou, Kérou-Kouandé-Péhunco, Sakété-Ifangni, Covè-Zagnanado-Ouinhi, Zogbomey-Bohicon-Zakpota, Djougou-Copargo-Ouaké, Bassila, Allada-Toffo-Zè, Djidia-Aborney-Agbangnizoun. The DSLO is a "redesign" of the vaccine supply chain implemented with support from AMP to improve the distribution system at the peripheral level by replacing the commune storage facilities with a single storage facility at the health zone level. In this case, distribution of vaccines to service provider locations will be carried out using the "push" model. The country plans to

use this distribution system for all the 34 health zones by 2020 (see single document - Overview - pages 15-16).

For the 23 health zones not yet using the DSLO approach (58 communes), **the commune storage facility** is the last distribution level within the country's supply chain. Within this system, the commune EPI manager will receive vaccines and supplies on monthly basis from the departmental storage facility and, then in turn, supply all the health centres in the commune ("pull" model). The vaccines are stored in insulated containers and taken to the communes using 4x4 vehicles. Health facilities are provided with vaccines and supplies on a monthly basis from the commune health centre on which they are dependent. This supply process is normally carried out using the centre's motorbikes or a private means of transportation. Frequently, those involved in the EPI at health centres go to the storage facility to complete their stock during the month.



Vaccine supply chain for 23 health zones implementing the "pull" system



Vaccine supply chain for 11 health zones implementing the "push" system

b) Weaknesses identified in the supply chain

The 2012 EVM assessment showed that the criteria should receive specific attention since all levels received poor scores, including: storage capacity, transport, maintenance and distribution (see 2012 EVM report 2012). An improvement plan has been developed (see 2012 EVM improvement plan) and implemented (see annual 2012 EVM improvement plan).

In addition, an EVM monitoring assessment was conducted in 2014 during the external EPI review with the participation of AMP and UNICEF and it showed improvements when compared to 2012. However, major problems remain for the following criteria (see other related documents: 2014 external EPI review report):

- E3 Storage capacity: 88% at the national level, 80% at the intermediate level and **68% at the peripheral level**,
- E5 Maintenance: **52% at the national level, 41% at the intermediate level and 41% at the peripheral level**,
- E7 Distribution: **61% at the national level, 20% at the intermediate level and 24% at the peripheral level**
- E9 Management and Information System (MIS), support function: **60% at the national level, 19% at the intermediate level and 38% at the peripheral level.**

This assessment shows that, at the **national level**, there is a lack of standard operating procedures for interacting with customs authorities as well as the lack of a contingency plan for releasing vaccines. At the **intermediate level**, there is not a systematic contingency plan and distribution programming and monitoring is not automatic. As a result, supervision at this level is often inadequate. At the **peripheral level**, vaccine quality is at risk, considering the conditions of storage and distribution. Maintenance is inadequate at all levels of the supply chain.

In addition to the EVM assessment, field supervision reports have shown that cold chain equipment is worn, obsolete, there is a lack of personnel training on preventive maintenance, prolonged and repeated stock-outs for spare parts, prolonged disrepair due to the lack of qualified technicians, the poor reliability of the national electricity grid as an energy sourced for health facilities who have access to electricity (outages and challenges making payment for electrical costs due to the cost-

recovery system).

It should also be noted that since 25 September 2017, the country has initiated a new EVM assessment for which the data has already been collected and is in the process of analysis.

c) Interventions to resolve these problems

At the national level, net vaccine storage capacity has grown from 13,000 Litres during the 2012 EVM to 54,000 Litres currently, due to the acquisition of four (4) new positive cold rooms. In addition, ANV-SSP acquired a refrigerated truck in 2014 for the transport of vaccines from the national level to the intermediate level. With regards to human resources, four ANV-SSP works received diploma-based training on health logistics (Professional "Licence"); three of these individuals received additional training on solar cold chain logistics. Standard operating procedures (SOPs) for vaccine logistics have already been developed, validated and are currently being disseminated. With regard to SOPs in relation to the customs authorities, a training plan for customs agents is currently under discussion.

At the intermediate level, all storage facilities currently have positive cold rooms (Atacora-Donga, Atlantique-Littoral, Borgou-Alibori and Zou-Collines) and two are currently being installed (Ouémé-Plateau and Mono-Couffo). With regard to strengthening personnel capacity, four out of six storage facility managers have been given diploma-based training in health logistics and one of these has been trained in solar cold chain logistics. In addition, SOPs are also being widely shared at this level.

At the peripheral level, the country is working to redesign the supply chain by deploying an optimised logistics system (DSLO) in all 34 health zones by 2020 to improve vaccine distribution conditions (see single document - Overview - pages 14-16). Every year, ANV-SSP contributes its own funds (National Budget) for 30 motorbikes and additional cold chain equipment to support the implementation of immunisation activities. This effort by ANV-SSP is supported by other partners like ROTARY INTERNATIONAL, UNICEF, AMP and the EPI FOUNDATION that annually provides support for generators, motorbikes and cold chain equipment.
To better monitor vaccine storage conditions, in 2016, the country also asked for and received from UNICEF a donation of 1,000 continuous temperature recorders for all cold chain equipment. In addition, all health facilities in the country are enrolled in Performance Based Funding (PBF) that generates additional resources to support EPI.

Concerning maintenance, ANV-SSP worked in collaboration with the Directorate of Infrastructure, Equipment, and Materials (DIEM) in the Ministry of Health to develop a national maintenance plan for cold chain equipment that will be extended to all levels of the supply chain (see 2017-2022 EPI cold chain equipment maintenance plan).

d) Obstacles impeding intervention implementation

The main obstacle impeding the implementation of initiatives cited above is funding.

- There are difficulties in expanding the DSLO approach due to financial resources that are insufficient for accessing all of the country's 34 health zones. The is working with partners to remove these difficulties and allow for an expansion by 2022.
- Renovating the cold equipment to be in PQS compliance is not taking place systematically due to insufficient financial resources. Related to this, discussions are ongoing regarding sustainable funding (see maintenance plan page 12), in

light of the equipment renovation.

e) Lessons learned from recent supply chain related support that informs the current request for CCE optimisation platform support.

Within the LOGIVAC project framework and LOGIVAC + implementation by AMP from 2012 to today, the country has benefited from significant funding for supply chain strengthening in the five health zones involved in DSLO (Comé-Bopa-Grand Popo-Houeyogbé, Lokossa- Athiémé, Aplahoue-Dogbo-Djakotomey, Klouékanmey-Toviklin-Lalo and Allada-Zê-Toffo). This support was seen in the acquisition and installation of PQS refrigerators (electric and solar) in health centres and health zone storage facilities, the donation to the health zones of 4x4 pick-ups (mobile storage facilities) for vaccine and input distribution and continuous temperature recorders (Freeze tag, Fridge tag 2). In addition, for each of the five health zones, there was renovation of vaccine storage facilities and provision of IT office equipment. In addition, these projects enabled experimentation with the computerized logistics information system (SIIL). Strengthening the capacity of participants at the health zone office level included three health workers undergoing a short (one month) training on immunisation logistics. A short three-day training was also given to 150 chief post nurses on immunisation logistics management.

The DSLO deployment phase revived the GTCL. This group is made up of the participants involved in the vaccine supply chain (ANV-SSP, UNICEF, WHO, AMP, PRPSS).

The order and purchase of CCE and the vehicles used for the mobile storage facility was made via the UNICEF supply chain.

Installation of refrigerators acquired within the framework of these projects is assured by the SODETAP company via its local representative, JAGLA Sarl. The B-Medical manufacturer, via its representative SODETAP, has already installed close to 40 solar refrigerators guaranteed for 10 years in Benin in 2016-2017.

In the 2014-2018 programme of cooperation between BENIN and UNICEF at the “survival and development of the child” component level, direct support is provided by UNICEF to 11 health zones (Malanville-Karimama, Banikoara, Kandi-Gogounou-Ségbana, Kouandé-Kérou-Péhunco, Covè-Zangnanado-Ouinhi, Djidja-Abomey-Agbangnizoun, Zogbodomey-Bohicon-Zakpota, Abomey-Calavi-So-Ava, Cotonou1 and 4, Cotonou 2 and 3, Savalou-Bantè), with a logistical component called “Optimisation of Immunisation Logistics’’. Within this framework, 59 solar CCE items (TCW 40SDD and TCW 2043 SDD) have already been installed or are currently being installed. Installation of equipment acquired within the framework of this support is carried out by ANV-SSP personnel who have previously been trained in logistics in collaboration with DIEM workers.

Through HSS, Gavi also directly supports two health zones (Sakété-Ifangni and Tchaourou). Within this framework, 20 acquired solar refrigerators (TCW 40SDD) are currently being installed by ANV-SSP personnel in collaboration with DIEM workers.

It should also be noted that, due to the national ‘’120 days to equip hospitals’’ initiative launched by the Ministry of Health in 2012, CCE equipment was graciously offered by local donors. Unfortunately, most of these equipment items do not comply with PQS standards (they are for domestic use).

The solar equipment installed is type B Medical (TCW 40 SDD and TCW 2043 SDD). To date, the post-installation operational rate is 99%. One item of equipment did not work and was replaced by the manufacturer. The post-installation assessments have shown that the equipment is functioning well and preserves the vaccines at the recommended temperatures. After each installation, users were briefed on the site about preventive maintenance tasks in order to guarantee proper functioning of the Cold Chain Equipment. To summarise, the key lessons learned from this recent show of support for the supply chain are :

Post-installation users briefing for solar CCE TCW 2043 SDD

Assembly of solar panels of CCE TCW 2043 SDD by the ANV-SSP team

- The country has a supply of reliable Cold Chain Equipment (UNICEF)
- The country can make use of local expertise with regard to Solar Cold Chain Equipment installation
- Several partners support CCE renovation (UNICEF, AMP and Gavi)
- There is local company representation providing CCE with good guarantees.
- The country is addressing compliance with CCE standards

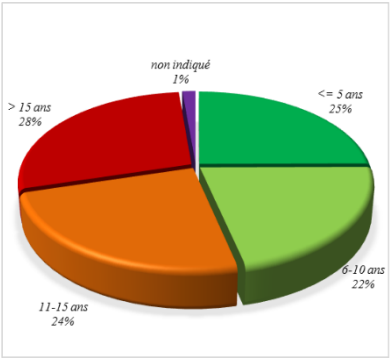
f) Percentage of installations that have reliable access to grid electricity for up to or more than 8 hours per day

In the country as a whole, 57% of equipment is linked to the national electric grid (see inventory report page 16).

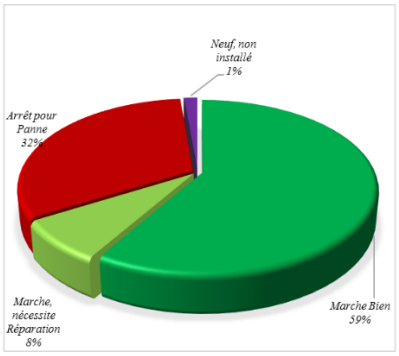
g) Quantity and percentage of current CCE that: a) is operational; b) is PQS (performance, quality, safety) approved; c) is not PQS approved; and/or d) is obsolete

According to the updated inventory conducted inAugust 2017, of the 1,525 CCE items inventoried throughout the entire country, there is:

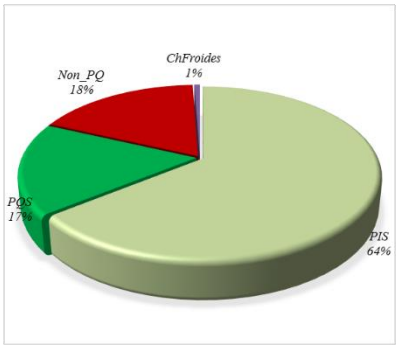
- **Operational CCE:** 894 or **58%**.
- ***CCE that is PQS approved:*** 263 or **17%**
- ***CCE that is not PQS approved:*** 1,253 or **82%**
- ***Obsolete CCE:*** 795 or **52%**



Distribution of EPI cold chain equipment according to age in Benin in 2017 (n = 1,525)



Distribution of EPI cold chain equipment according to operational status in Benin in 2017 (n = 1,525)



Distribution of EPI cold chain equipment according to compliance with standards in Benin in 2017 (n = 1,525)

h) The birth cohort served by effectively functioning, PQS-approved CCE

According to the inventory, out of the 904 health facilities inventoried, 515 have at least one PQS-approved CCE. In terms of birth cohort, this represents **78%** of the annual birth cohort living in the country. Toward the goal of immunisation equity, the country is targeting a 100% success rate.

i) Supply chain challenges that CCE optimisation platform support will assist in mitigating?

The main challenges linked to the supply chain can be summarised as follows: (i) lack of standard operating procedures (ii) non-systematic contingency plan, (iii) programming and monitoring of inadequate distribution (iv) insufficient supervision, (v) considering storage and distribution conditions, vaccine quality is at risk, (vi) insufficient maintenance.

With support for the cold chain optimisation platform:

- Increased cold chain equipment coverage for health centres will allow for supply chain improvements for high-quality vaccines and to maintain their permanent availability.
- Cold chain equipment renovation will reduce the risk of exposing the vaccines to inappropriate temperatures, the use of poor quality spare parts and fuel, and situations which lack immunisation equity. CCE will be distributed according to real need in terms of health facility capacity and the choice of equipment will be made with regard to the realities present at each level.
- During installation, the staff will be trained on preventive maintenance. The maintenance system will be reorganised according to the maintenance plan provisions. SOPs will be distributed.

j) Other challenges related to the supply chain that CCE optimisation platform support will assist in mitigating

Optimisation platform support will also enable the country to improve several other health indicators.

- ***Access to immunisation by the country's entire population**:* Availability of CCE in health areas will provide access to 276 health facilities that currently do not have any equipment. The health facilities will be able, therefore, to provide high-quality immunisation services to populations that otherwise would not have easy access to them.

- ***Increased immunisation coverage**:* Additional CCE equipment will contribute to reducing missed immunisation opportunities due to the increased number of immunisation sessions provided via both the fixed and outreach strategies. A reduction in the drop-out rate will also be noted due to direction contact with the population. Effective immunisation coverage will be improved with an incidence of reduced vaccine-preventable diseases and occurrence of epidemics in regions that are well covered.
- ***Equity between all zones and health centres**:* This proposal will enable the expansion of CCE coverage to health facilities throughout the country in an equitable manner, taking into account parameters linked to segmentation and the population's actual needs.
- ***Vaccine safety and quality**:* The request for support is for the acquisition and installation of the latest generation cold chain equipment. The availability of reliable, high-performing and low maintenance cold chain materials will enable health centres to store and administer quality vaccines.
- ***Strengthening CCE maintenance**:* The availability of trained and qualified technicians will make it possible to provide quality maintenance and optimise equipment operation so as to guarantee vaccine availability and quality at all levels. The proposal will enable the EPI to rehabilitate and expand cold chain equipment and to standardise models in order to assure acquisition of replacement parts and proper maintenance. (See CCE Maintenance: strategic focus 3 pages 19-21.)
- ***Updating equipment inventory**:* A mechanism for annually updating the CCE inventory will provide for collecting and analysing data to adjust need (see CCE maintenance plan page 21).
- ***Health facility cost-recovery level**:* Health facilities that are equipped with solar CCE will experience financial savings due to the fact that there will not be equipment that uses fuel or electricity. This new financial savings will be allocated to other primary health-related expenses at the health facility level (purchase or medication, strengthening implementation of immunisation outreach strategies).

h) The country's global cold chain equipment need

The country's global need for 2017-2022 in terms of cold chain equipment for the operational level (health facilities, health zone facilities), has been estimated in the rehabilitation plan and is:

- 887 refrigerators (276 of which are for centres that do not have cold chain equipment) targeted at health facilities (see segmentation plan in the inventory report)
- 69 refrigerators for the health zones storage facilities

In 2017, ANV-SSP and certain partners (AMP, UNICEF, HSS/Gavi) provided CCE support to the health zones by providing 135 certified refrigerators which have already been installed and other refrigerators that are currently being installed.

These various acquisitions (ANV-SSP, AMP, UNICEF, HSS/Gavi) are summarised in the table below:

Departments	Partners				
	AMP	ANV-SSP	HSS/Gavi	UNICEF	Total
Atacora-Donga	0	2	0	8	10
Atlantique-Littoral	11	1	0	3	15
Borgou-Alibori	0	1	10	23	34
Mono-Couffo	38	1	0	0	39
Ouémé-Plateau	0	1	10	0	11

Zou-Collines	0	1	0	25	26
Total	**49**	**7**	**20**	**59**	**135**

This proposal will be implemented starting October 2018 and will cover additional need of **704 refrigerators** (310 extensions and 707 replacements or expansions).

The deployment of this equipment purchased within the CCEOP framework will be for a two (2) year period of time: going from 2018 and 2020 (see Chapter 3 of the proposal's single document). The year 2018-2019 will be the year of the phase that prioritises the need of extending and expanding CCE. As for 2019-2020, this will be the year when the focus is on replacing, rehabilitating and extending the remaining CCE.

This is summarised in the following table:

Types of equipment		**Pieces of equipment**		**Total**
		2019	**2019-2020**	
Healthcare Facility	Electric refrigerator (TCW 2000 AC)	113	79	192
	Small-capacity solar refrigerators (TCW40R SDD)	307	144	451
Health zone storage facilities:	Large-capacity electric refrigerators (VLS 350 A)	61	0	61
Total		**481**	**223**	**704**

With the new donations that will be acquired through this CCEOP proposal, coverage within the country of approved and reliable CCE will increase from 17% in2017 to 100% in 2020

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 the requested support for the platform will contribute to truly eradicating inequalities:

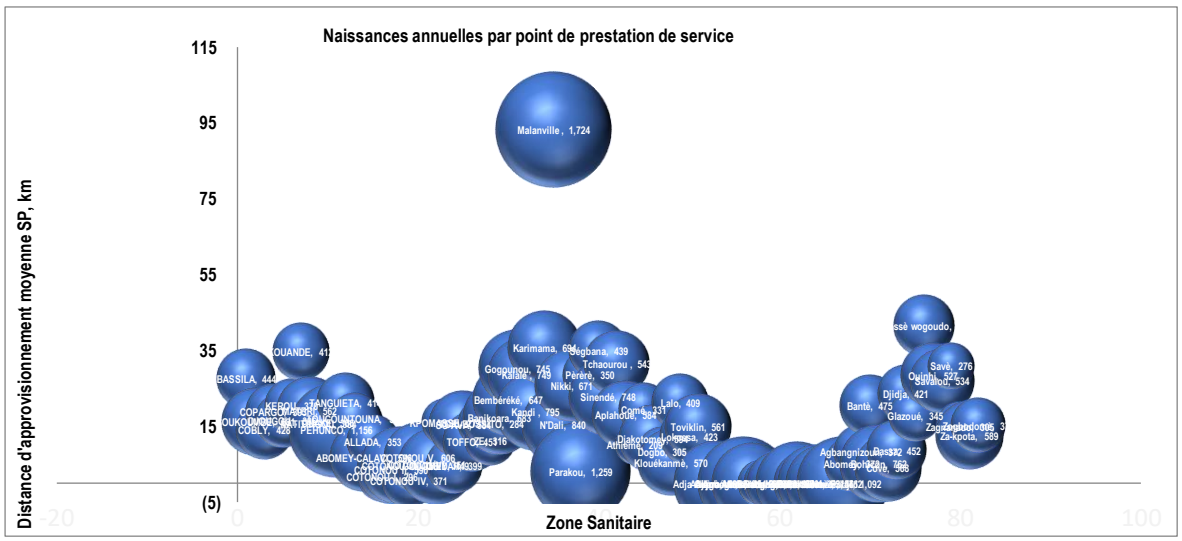
The 2012 DHS coverage data indicates that there is no difference between men and women with regards to immunisation

access. DTP-HepB – HiB coverage for boys was 74.4 % as opposed to 73.3 % for girls. The 2014 external EPI review also confirmed the existence of gender equity in immunisation. For 9,119 [sic] boys and 8,756 girls [sic], performance indicators were identical (see figure below) as was the gross data (card or history) and the valid data (standard, to one year). This success will be preserved, due to the strategies the programme uses.

Immunisation coverage between boys and girls (card, BCG scar, Polio 0, Penta 1, Penta 3 and fully immunised child) from the 2014 external EPI review

This equity was not reflected geographically. Only eight (8) communes had at least 80% of children fully immunised, while in 14 communes, the rate of children who are fully immunised was less than 50%. This inequity will be corrected due to the deployment based on the segmentation plan by prioritising disadvantaged areas in terms of coverage, in the initial support phase. In addition, the other causes of inequity identified during immunisation activity monitoring will be resolved by the implementation of plans to resolve specific problems.

In terms of average supply distance from service provider locations for quality vaccines, inequities exist. Health facilities that currently do not have CCE or have CCE in disrepair are required to have access to those facilities that do have operational equipment for vaccine resupply. This situation adds further delay to the supply process, reduces the occasions when immunisation is offered, and does not motivate those active in immunisation service at the operational level. This is the case, for example, for certain locations in the country's northern region (Malanville, Karimama, Ségbana, Ouéssè Wogoudo, etc.). With the expansion of the CCE at new sites and the rehabilitation of old equipment, support for the platform will noticeably contribute to reducing inequitable access at the service provider locations which offer immunisation services with quality CCE.



Distribution service locations in relation to average supply distances and number of annual births

In addition, the 2014 Multiple Indicators Cluster Survey (MICS) survey has shown that there are significant differences (27 %) between the poorest and wealthiest quintiles. Due to support for the platform, the missed opportunities that generate additional expenses for poor households will be reduced. Increased CCE coverage, accounting for the 279 health facilities that currently do not have CCE, will reduce opportunity costs (transport and other indirect costs) for the most disadvantaged of families. This will lead to reducing the gap between the poorest and wealthiest quintiles.

b. Analyses that were carried out and/or plans in progress to optimise the design of the supply chain's distribution system:

Optimisation of the logistics vaccine chain (DSLO) begun in 2013 targets closing commune storage facilities and transferring them to the health zone level. By 2022, the end goal is that the last distribution level will have 34 zone storage facilities instead of 82 commune ones. In 2017, the deployment of the optimised logistics system affected 11 health zones. Within the framework of this deployment, two supply systems exist at the same time: the push system and the pull system. The push system which is in an expansion phase has currently been implemented in 11 health zones. The deployment pilot experiment for the optimised logistics system has shown that vaccine availability improved in the Comé health zone. This approach efficiently contributed to reaching the sustainable development goals and promotes access to quality vaccines for all targets.

c. How these system design considerations have impacted the choice of CCE to be supported by the platform:

The DSLO health zones have already installed B-Medical TCW2000 AC and Vestfrost VLS 350 A electric refrigerators as well as Vestfrost MF 314 freezers and the country will focus on implementing this equipment in the rest of the commune and health zone storage facilities. Sibir® and Electrolux® brand absorption refrigerators are the most common equipment used at the peripheral level and will be replaced by B-Medical TCW40SDD or TCW 2043SDD refrigerators in health facilities where access to electricity is not reliable. The same type of equipment has already been installed in health facilities implemented for the DSLO system. As of today, there have been no incidents or accidents reported that relate to this equipment. In addition, users express satisfaction with this equipment. For health facilities linked to the electric grid, the model B-Medical TCW2000 AC has been selected.

d. Concretely, how the platform support will help improve the sustainability of the supply chain system:

In 2017, there are 17 health zones that either do not have any freezer capacity, any refrigeration capacity, or that lack both of these types of capacity at the same time (see rehabilitation plan). Projected vaccine storage need shows that, in 2022, 24 health zones will lack sufficient storage capacity if no action is taken. Support for the platform will enable CCE to be provided to these zones that lack capacity and to renovate CCE for the zones that need it, ensuring cold chain sustainability.

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 the country will ensure that aspects of maintaining the cold chain are addressed (e.g. preventive and corrective maintenance, monitoring functionality, technicians, financing for maintenance, etc.): (See maintenance plan pages 19-21, 24)

Preventive cold room maintenance will be done by both users and private companies under contract. Each piece of equipment will have a maintenance registry which will contain information about the various maintenance interventions that have occurred. At the peripheral level, the EPI manager will transmit information about the operation of the commune's cold chain equipment to the health zone office via telephone on a weekly basis. In their respective zones, health zone maintenance technicians should systematically test cold chain equipment operations monthly. Observations made during these tests will be noted in the maintenance registry and a report will be transmitted to the health zone's physician-coordinator with a copy to the departmental health directorate. Reports will be transmitted to the correct hierarchy, according to the level. These reports will be analysed during staff meetings at the logistics directorate. This will ensure effective maintenance at all levels.

b. How the country will monitor the completion of preventive and corrective maintenance? (See maintenance plan pages 22-24):

A monitoring and evaluation mechanism will be implemented to evaluate maintenance activity performance. Plan funding will be ensured by the national budget with secured budget line items that exist at all levels of the pyramid-like health structure. Participation from traditional financial and technical partners is also expected.

c. How the country will dispose of obsolete and irreparable equipment replaced by CCE optimisation platform equipment:

(See maintenance plan page 15, 22)

Disposal will take place according to the Public Administration's equipment disposal procedures. Disposal is managed by the Directorate General of Equipment and Logistics (DGML) within the Ministry of the Economy and Finance *(Decree no.1108/MEF/CAB/DGML/DM/SM from 10/09/2003 addressing used administrative equipment and furnishings).*

Before equipment is disposed of, the following steps must be taken:

- identification of a location to store equipment not in use (administration);
- decontamination of contaminated equipment before it is stored (user supported by health agent and maintenance technician);
- salvaging of any parts that are still useful (maintenance technician);
- Removal of non-used equipment from service and the equipment fleet which is then sent to the storage facility (maintenance technician + administration).

Cold chain equipment that is disposed of following an inventory will follow the same process as described above.

In all cases, environmental standards should be followed.

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. Facilitating the manufacturer's or representative's role in equipment purchase, distribution and installation:

The mapping of sites will be helpful and will be provided to the manufacturer or the manufacturer's representative. The list and contacts responsible for the facilities concerned will also be available. In addition, ANV-SSP will use its own funds (national budget) to assess in advance the sites that are to be beneficiaries of solar equipment. The assessment report will be made available to the manufacturer. All decisions will be made to ensure cooperation between those in charge of the health posts and the manufacturer and/or the manufacturer's representative.

b. Investment source:

The global cost of the proposal is estimated at **US$ 4,208,988**, split between Gavi, responsible for **USD$ 3,367,190** (80% of total CCE cost) and country co-financing in the amount of **US$ 841,798** (20% of total CCE cost).

The portion of the joint investment will [be] assured by the current HSS/Gavi grant. The current balance of financial resources for the HSS/Gavi logistics component is around **US$ 1,195,253** and is sufficient to make the country's co-funding contribution possible.

The summary table of funding for the years 2018 and 2019 is shown as follows :

Year	Source of funding	Funding amount (US$)	Indication of funding situation	Inclusion in the budget
2018	HSS/Gavi	841,798	Secured	yes
	Gavi	770,556 2,264,908	Secured	yes
2019	Gavi	1,102,282	Secured	yes

c. Custom duty exemptions:

Currently, agency acquisitions take place via the UNICEF supply division. Therefore, in compliance with the memorandum of understanding between BENIN and UNICEF, a customs exemption has been granted to acquisitions received through this channel (see MOU). The recipient is still ANV-SSP whose address is always shown on the package. With each pre-

alert, the Minister of Health presents the Director General of Customs with a request for direct pickup and an exemption of customs duties for specifically defined packages (vaccines, supplies, cold chain equipment, transport vehicles, etc.) by attaching the required documents (BESC, certificate of item delivered by the UNICEF country office, pre-alert, pro forma invoice, [packing] list). The Director General of Customs then delivers an authorisation for pickup to the Ministry of Health using simplified procedures and an exemption of duties and taxes for the relevant packages. Payment of all other related taxes are the responsibility of the Ministry of Health.

Through today, no difficulties have been encountered during the implementation of this procedure; it has been used for the acquisition of the solar cold chain equipment by the programme. It is through this procedure that ANV-SPP has been able to acquire the 153 items of cold chain equipment already installed or in the process of installation. It is also this procedure which allows the ANV-SSP to be provided with the current new cold rooms, refrigerant and dry trucks for the transport of vaccines and supplies, and supervision vehicles. All the equipment and supplies have been taken to the port of Cotonou with custom duties exemption.

Several sample documents for the process of exempting customs duties have been added here in the annexes (request for custom duties exemption, certificate of donation, authorisation for pickup using simplified procedures and exemption of duties and taxes).

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. 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'.*

For each prioritised (urgent) 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*

CCE Priority Need (urgent) #1: Year 2018-2019 – Health zone/commune storage facilities

The need	Within the envisaged DSLO, the country will have 34 zone storage facilities to replace the 85 commune storage facilities to store vaccines as the final level for distribution to health facilities. The analysis of the gaps with the EPI Log Forecasting Tool has allowed the release of 25 sites to be equipped from now until 2020. Among these 25 sites, 3 have already been equipped and need extension of 5 items of equipment. This includes ZS Comé-Bopa-Grand-Popo-Houéyogbé, Klouékamé-Toviklin-Lalo and Aplahoué-Dogbo-Diakotomev. The **22 sites** remaining will be covered with **56 items of equipment** as an extension of zone storage facilities within the DLSO framework. These zone storage facilities will be equipped with positive 127-litre Vestfrost® VLS350A electrical CCE.
Justification	Priority 1 will be to provide for zone storage facilities that will store vaccines to be distributed to health facilities. In actual fact, these storage facilities are the last level for distribution of vaccines in the supply chain. By equipping them, the country accelerates the optimisation process for the supply chain at the operational level. It is a question therefore of a boost for the

	DSLO.
Expected outcome	By equipping these health zone storage facilities: - immunisation coverage for the population will improve, and, as a result, so will that of the entire country - high-quality vaccines will be more readily available - incidence of vaccine-preventable disease and epidemics that occur in the context of good immunisation coverage will be reduced. - There will also be a reduction in adverse events following immunisation (AEFI), because, even if the documentation is not sufficient, we know that vaccines subject to poor storage strongly contribute to an elevated number of AEFI's cases. All of this will contribute to improving immunisation equity.
Total CCE budget	**US$ 122,515.**
CCE Priority (urgent) No. 2: Year 2018-2019 –Service locations with equipment in disrepair, that is not repairable, or without active equipment	
The need	Following on from the inventory, 313 structures made up of equipment which was broken and non-repairable of which 77 are in the process of being rehabilitated in 2017. There remain 236 sites to be rehabilitated with equipment with required positive capacity less than 36 litres. There are 57 which use reliable electric energy which will be provided with the same number of **refrigerators type TCW 2000 AC**. The remaining 179 will receive this number of equipment of **type TCW 40R SDD**. It is a case for a need for **replacement.** Among equipment to be replaced, there are **18 which are PQS and 218 which are NON PQS.** There are 276 service locations which are without Cold Chain Equipment in the country. Among 276 health facilities, 12 have a required positive capacity greater than 36 litres and 264 have a required positive capacity comprising between 0 and 36 litres. While taking into account the availability of reliable energy, the need for Cold Chain Equipment (CCE) summarised as 66 refrigerators of type TCW 2000 AC of which 10 will be equipped in 2017 as **a need not covered by 56 refrigerators of this type,** 208 of type TCW 40R SDD of which 80 were equipped in 2017 as **a need not covered by 128 refrigerators of this type** and 2 of type TCW 2043 SDD which will be equipped in 2017. These needs are **extension** needs.
Justification	Due to having no CCE, there are 276 service locations that cannot offer high-quality immunisation services to the population. Several of these service locations are new health centres, built to bring care close to the populations who are very far with difficult access but, unfortunately, EPI cold chain equipment has not been installed due lack of financial resources. This is the case for several health facilities in the northern part of the country, specifically the departments of Atacora, Donga, Borgou and Alibori where the terrain is very rugged. For the 313 service locations where the equipment is in disrepair and not repairable, there are

	no spare parts on the market for this equipment and, in addition, storage sites are closed and service providers are required to have access to health facilities that still have operating equipment to receive a supply of vaccines. This contributes to immunisation activity participants experiencing a lack of motivation.
Expected outcome	By equipping these health facilities: - high-quality vaccines will be more readily available - immunisation coverage for the population will improve, and, as a result, so will that of the entire country - this will contribute to reducing specific (Penta1-Penta3) and global (BCG-MCV) drop-out rates all of this will contribute to improving immunisation equity
Total CCE budget	**US$ 2,548,368**
CCE Priority Need (urgent) No. 3: Year 2019-2020 – Service locations with domestic-grade equipment or PIS absorption	
The need	With the inventory data and, after having satisfied the preceding priority needs, there will remain 118 that will be equipped with domestic-grade CCE to be replaced. Among these 188 service locations, 10 will be provided for the duration of 2017 as a need not covered by 108 items of equipment. After taking priorities 1, 2 into account and the replacement of all the domestic equipment, there will still remain 89 service locations making use of absorption PIS equipment which will need be replaced.
Justification	These service locations store vaccines in conditions that do not ensure optimal quality, depending on the type of storage used. So that there would be cold chain equipment for immunisation activities with the financial resources available, certain people of good will, even health facility managers, took the initiative to purchase domestic-grade equipment instead of approved equipment. Several health facilities throughout the country preferred that to continuing to have no CCE, specifically within the implementation of a PBF context that significantly focuses on immunisation. PIS absorption equipment does not meet environmental standards in that fuel cannot be disposed of in an acceptable manner, and spare parts are becoming more and more difficult to have supplied.
Expected outcome	In replacing the pieces of equipment in these health facilities: - high-quality vaccines will be more readily available - incidence of vaccine-preventable disease and epidemics that occur in the context of good immunisation coverage will be reduced. - There will also be a reduction in adverse events following immunisation (AEFI), because, even if the documentation is not sufficient, we know that vaccines subject to

	poor storage strongly contribute to an elevated number of AEFI's cases. All of this will contribute to improving EPI performance in Benin.
Total CCE budget	**US$ 1, 175,714**
No. 4: 2019 – Service locations with equipment that is more than ten (10) years old	
The need	After taking the three preceding levels of prioritisation into account, the analysis has revealed that there will still be 34 health facilities where the CCE will only create problems with age and which will become obsolete. Among these 34 health facilities, 8 are currently in the process of being equipped by the partners. Furthermore, the need for replacement expected by support for the platform is 26 CCE for the 26 existing health centres conducting immunisation activities with the PQS equipment with adequate capacity but which are obsolete.
Justification	The 26 service locations store vaccines in equipment for which the maintenance costs are becoming more and more expensive. With the cost-recovery problems experienced by Benin's health facilities and considering the difficulties observed in implementing preventive maintenance at the operational level, optimal vaccine storage conditions are not guaranteed with this obsolete equipment.
Expected outcome	In replacing the CCE for the 26 health facilities: - high-quality vaccines will be more readily available - incidence of vaccine-preventable disease and epidemics that occur in the context of good immunisation coverage will be reduced. - There will also be a reduction in adverse events following immunisation (AEFI), because, even if the documentation is not sufficient, we know that vaccines subject to poor storage strongly contribute to an elevated number of AEFI's cases. All of this will contribute to improving EPI performance in Benin.
Total CCE budget	**US$ 124,146**
GRAND TOTAL CCE BUDGET: Initial support (Years 1 and 2)	**US$ 122,515** (Priority 1) + **US$ 2,548,368** (Priority 2) + **US$ 1,175,714** + (Priority 3) + **US$ 124,146** (Priority 4) + **US$ 238,245** (6% of additional costs) for a total budget of **US$ 4,208,988**

	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*
	0	0	0	0	5	3	56	22
	-218	-218	18	18	-0	-0	0	0
	-108	-108	0	0	-0	-0	-184	-184
	-89	-89	-0	-0	-0	-0	-0	-0
	-26	-26	-0	-0	-0	-0	-0	-0
Total	**441**	**441**	**18**	**18**	**5**	**3**	**240**	**206**

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. *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 *Describe all planned or ongoing activities related to improving the availability and performance of supply chain managers, their sources of funding, and partner support.*	Within the framework of implementing the EVM improvement plan, a certain number of activities have been undertaken to improve the availability and performance of supply chain managers. This includes: • The training of all vaccine logistics managers at the national and intermediate level: four ANV-SSP works received diploma-based training on health logistics (Professional "Licence"); three of these individuals received additional training on solar cold chain logistics. Four out of six departmental storage facility managers have been given diploma-based training in health logistics and one of these has been trained in solar cold chain logistics. The plan is for the remaining cold chain managers to be trained by 2020. • The organisation of training sessions on DVD-MT and SMT (intermediate level) and in technical EPI management (operational level). • Training supply chain managers on leadership: Four managers involved in the national-level vaccine supply chain have already undergone leadership training (STEP programme organised by GAVI at the Ouidah LOGIVAC centre). The plan is for additional supply chain managers to undergo this training. These activities are financed by partners (Gavi HSSS, WHO, UNICEF and AMP).
Data for supply chain management *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.*	Within the framework of this proposal, the following activities will contribute to strengthening logistical data management: - making the use of logistics management tools (DVD-MT) systematic at all levels of the chain; - implementing the data quality improvement plan, giving specific attention to logistics data; - integrating logistics data into DHIS2 in cooperation with the Directorate of Planning and Forecasting (DPP); - strengthening logistics managers' computer equipment skills; - expanding the computerised logistics information system (SIIL) to all health zones; the SIIL is an e-LMIS that is currently being tested in health zones receiving support from AMP within the framework of DSLO;

	- strengthening the continuous temperature monitoring system at the national and departmental levels; Funding for these planned activities will be assured by the State budget, and that of the partners (HSS/Gavi, OMS, UNICEF and AMP).
Optimised, efficient design of distribution system *Describe all planned or ongoing activities related to distribution system design optimisation, their sources of funding, and partner support.*	Optimisation of the logistics vaccine chain (DSLO) begun in 2013 targets closing commune storage facilities and transferring them to the health zone level. By 2020, the end goal is that the last distribution level will have 34 zone storage facilities instead of 82 commune ones. In 2017, the deployment of the optimised logistics system affected 16 health zones. Within the framework of this deployment, two supply systems exist at the same time: the push system and the pull system. The push system which is in an expansion phase and has currently been implemented in 16 health zones. The ANV-SSP suggests adding five new health facilities in 2018. Funding for this optimisation will be assured by the Ministry of Health and partners (HSS/Gavi, WHO, UNICEF and AMP).
Continuous improvement process *Describe all planned or ongoing activities related to continuous improvement processes, their sources of funding, and partner support.*	During its quarterly meetings, the GTCL must assess the progress made toward the objectives set and suggest corrective action as needed. Funding the operation of GTCL is assured by partners (AMP, UNICEF).
Temperature monitoring *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 – electronic temperature monitoring of goods sensitive to freezing).* *Furthermore, describe which measures are in place to a) obtain temperature data from the various devices;* *b) act following temperature alarms (curative maintenance);* *c) in case of RTM devices, please elaborate on SOPs for each responder in the temperature monitoring system; and* *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.*	Currently, all CCE have continuous temperature recorders and temperatures are taken down twice a day on temperature sheets. At the peripheral level, the commune EPI manager transmits information about the temperature recorder situation to the health zone office via phone every week. This information will be consolidated in a summary report by the manager in charge of epidemiological surveillance, who analyses the information during office health zone staff meetings. Feedback will be collected from all users and shared with the Departmental Public Health Service's Immunisation Division. If the analysis report notes that there have been alarms or other malfunctioning, corrective action will be taken (the emergency plan will be implemented, maintenance technicians will be called, etc.)

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.

☆	Budgets are **not inclusive** of operational cost. 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/

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*	
Prioritised (Additional) CCE Need #1	
The need	
Justification	
Expected outcome	
Total CCE budget	
Prioritised (Additional) CCE Need #2	
The need	
Justification	
Expected outcome	
Total CCE budget	
Prioritised (Additional) CCE Need #3	
The need	
Justification	
Expected outcome	
Total CCE budget	
Prioritised (Additional) CCE Need #4	
The need	

Justification	
Expected outcome	
Total CCE budget	
GRAND TOTAL CCE BUDGET: "Scale-up support" (Years 3, 4 & 5)	

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 existing sites and new service locations (taking sites into account whether or not offering immunisation and those which are without active equipment (refrigerator) to be equipped with platform equipment	
	No of Equipment	*No of sites*	*No of Equipment*	*No of sites*	*No of Equipment*	*No of sites*	*No of Equipment*	*No of sites*
Total								

14. Ongoing or planned activities around other supply chain fundamentals in the scale-up 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. *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 *Describe all planned or ongoing activities related to improving the availability and performance of supply chain managers, their sources of funding, and partner support.*	
Data for supply chain management *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.*	
Optimised, efficient design of distribution system *Describe all planned or ongoing activities related to distribution system design optimisation, their sources of funding, and partner support.*	
Continuous improvement process *Describe all planned or ongoing activities related to continuous improvement processes, their sources of funding, and partner support.*	
Temperature monitoring *Describe how the temperature monitoring system will evolve? Which devices will be used?* *<u>Furthermore, describe which measures are in place to</u>* *a) obtain temperature data from the various devices;* *b) act following temperature alarms (curative maintenance);* *c) in case of RTM devices, please elaborate on SOPs for each responder in the temperature monitoring system; and* *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.*	

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. This list is based on the 'Type of equipment and energy source'*
- *Fill out the 'Estimated service bundle cost' and 'Number of equipment' requested*
- *In cells **CA and CB** on the sheet 'Choice of specific CCE model' (to the right of the 'Total CCE OP Request' table), countries must fill out second and third preference for each model selected. The second and third preference should be comparable products in the same 'Capacity category regarding storage of vaccines in L' of their model selected.* **Countries are informed that Gavi, and its Alliance partners principally UNICEF, will try as much as possible to respond to countries' first equipment preference. However, manufacturers' lead time could also lead to countries receiving cost estimates for either their second or third choice.**

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

Budgeting for UNICEF Supplementary costs and Procurement fees

- ***Supplementary cost(s): A fixed price of 7% on total equipment cost has been built into the budget template. This will covertaking into account, for example, currency variations, budgetary variability relating to equipment, costs associated with a package of services, demurrage and to the costs incurred, or just simply a protocol deviation. This will be returned to country, if unused.***
- ***UNICEF Procurement fees: Countries will also need to pay UNICEF's annual procurement costs on their joint investment only. This will be less than or equal to 8.5% for the country joint investment portion. 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.

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:* • ***5 MANDATORY intermediate results indicators;*** • ***1 MANDATORY intermediate result indicators if countries are procuring User independent freeze protected cold boxes and vaccine carriers; and*** • ***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)* *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;* *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.* *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,[5] such as demonstrated by remote temperature monitoring; ***and***

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 (2017)*** *(Provide numerator and denominator for calculating percentage)*	***Target Year 1 (2018)*** *(Provide numerator and denominator for calculating percentage)*	***Target Year 2 (2019)*** *(Provide numerator and denominator for calculating percentage)*	***Target Year 3 (2020)*** *(Provide numerator and denominator for calculating percentage)*
1. CCE Replacement/rehabilitation in existing Equipped sites	*Proportion of equipped health facilities having a PQS refrigerator for the preservation of vaccines*	*Updated Inventory Report*	*Annual*	*Numerator = Number of facilties equipped with a PQS refrigerator* ***(87)*** *Denominator= Number of health facilities equipped with an adequate CCE* ***(628)*** *Percentage***= *14%***	*Numerator = number of facilities equipped with a PQS refrigerator* ***(377)*** *Denominator=Number of health facilities equipped with a CCE* ***(628)*** *Percentage= **60%***	*Numerator = number of facilities equipped with a PQS refrigerator* ***(904)*** *Denominator= Number of health facilities equipped with a CCE* ***(904)*** *Percentage= **100%***	*Numerator = number of facilities equipped with a PQS refrigerator* ***(904)*** *Denominator= Number of health facilities equipped with a CCE* ***(904)*** *Percentage **100%***
2. CCE extension in existing new sites sites	*Proportion of health facilities previously without a refrigerator and having benefitted from a PQS*	*Updated Inventory Report*	*Annual*	*Numerator = Number of facilities*	*Numerator: Number of facilities previously without equipment*	*Numerator: Number of facilities*	*Numerator: Number of facilities*

[5] **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.

without equipment:	*refrigerator for immunization activities*			*previously without equipment having received a platform-compliant refrigerator (0)* *Denominator= Number of health facilities previously without CCE* ***(276)*** *Percentage=* ***0%***	*having received a platform-compliant refrigerator* ***(276)*** *Denominator= Number of health facilities previously without CCE (****276)*** *Percentage=* ***100%***	*previously without equipment having received a platform-compliant refrigerator* ***(276)*** *Denominator= Number of health facilities previously without CCE* ***(276)*** *Percentage=* ***100%***	*previously without equipment having received a platform-compliant refrigerator* ***(276)*** *Denominator= Number of health facilities previously without CCE* ***(276)*** *Percentage=* ***100%***
3. ***CCE expansion in equipped sites****:*	*Proportion of health facilities without adequate storage capacity having experienced an expansion in their storage capacity (to deal with the introduction of new vaccines)*	*Updated Inventory Report*	*Annual*	*Numerator = Number of health facilities without adequate storage capacity which have experienced an expansion* ***(0)*** *Denominator= Number of health facilities without adequate storage capacity* ***(287)*** *Percentage=* ***0%***	*Numerator = Number of health facilities without adequate storage capacity which have experienced an expansion* ***(150)*** *Denominator = Number of health facilities without adequate storage capacity* ***(287)*** *Percentage=* ***52%***	*Numerator = 252* *Number of health facilities without adequate storage capacity which have experienced an expansion* ***(200)*** *Denominator= Number of health facilities without adequate storage capacity which have experienced an expansion* ***(287)***	*Numerator = 252* *Number of health facilities without adequate storage capacity which have experienced an expansion* ***(287)*** *Denominator= Number of health facilities without adequate storage capacity which have experienced an expansion* ***(287)***

						*Percentage= **70%***	
4. CCE maintenance	*Proportion of health facilities reporting at least one alarm*	*Temperature Recorder Data Analysis Report*	*Quarterly*	*Numerator : Number of health facilities reporting at least one alarm **(Not Available)*** *Denominator : Number of health facilities with refrigerator for the preservation of vaccines **(628)*** *Percentage = **Not Available***	*Numerator : Number of health facilities reporting at least one alarm **(0)*** *Number of health facilities with refrigerator for the preservation of vaccines **(628)*** *Percentage **= 52%***	*Numerator : Number of health facilities reporting at least one alarm (**904)*** *Number of health facilities with refrigerator for the preservation of vaccines **(904)*** *Percentage **= 70%***	*Numerator : Number of health facilities reporting at least one alarm **(904)*** *Number of health facilities with refrigerator for the preservation of vaccines **(904)*** *Percentage **= 0%***
5. Maintenance of cold chain equipment	*Proportion of health facilities reporting at least one item of equipment not working due to breakdown*	*CCE Maintenance Report*	*Quarterly*	*Numerator : Number of health facilities reporting at least one item of equipment breakdown **(Not Available)*** *Denominator : Number of*	*Number of health facilities reporting at least one item of equipment breakdown **(0)*** *Denominator =* *Number of health facilities with CCE **(904)*** *Percentage **= 0%***	*Number of health facilities reporting at least one item of equipment breakdown **(0)*** *Denominator = Number of health facilities with*	*Number of health facilities reporting at least one item of equipment breakdown **(0)*** *Denominator = Number of health facilities with CCE **(904)*** *Percentage **= 0%***

				health facilities with CCE ***(628)*** *Percentage =* ***Not Available***		*CCE* ***(904)*** *Percentage* ***= 0%***	

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. Full	*Proportion of health*	*SIIL-SMT*	*Monthly*	*Numerator :*	*Numerator =*	*Numerator :*	

availability of stock	*facilities which have experienced stock-outs*			*Total number of health facilities which have experienced stock-outs (Not Available) Denominator: Total number of health facilities **(904)*** *Percentage: **(Not Available)***	*Number of health facilities which have experienced stock-outs (0)* *Denominator = Total number of health facilities **(904)*** *Percentage **= 0%***	*Number of health facilities which have experienced stock-outs (0)* *Denominator = Total number of health facilities **(904)*** *Percentage **= 0%***	*Numerator : Number of health facilities which have experienced stock-outs (0)* *Denominator: total number of health facilities **(904)*** *Percentage: **0%***
2. Strengthening the Capacities of CCE Managers : Train 1,000 health agents involved in EPI in logistical management and cold chain maintenance	*Proportion of trained managers*	*ANV-SSP Activity Report, Training Report*	*Annual*	*Numerator : Number of health agents involved in EPI trained in logistical management and cold chain maintenance (0) Denominator : Total number of health agents scheduled to be trained (1,000)* *Percentage : 0%*	*Numerator : Number of health agents involved in EPI trained in logistical management and cold chain maintenance (300)* *Denominator : Total number of health agents scheduled to be trained (1,000)* *Percentage: 30%*	*Numerator : Number of health agents involved in EPI trained in logistical management and cold chain maintenance (300)* *Denominator : Total number of health agents scheduled to be trained (1,000)* *Percentage 60%*	*Numerator : Number of health agents involved in EPI trained in logistical management and cold chain maintenance (600)* *Denominator : Total number of health agents scheduled to be trained (1,000)* *Percentage 100%*
