October 16th, 2017

Nigeria's experiences and forward looking strategy with SDDs

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- Nigeria's Cold Chain System Post SDD Procurements
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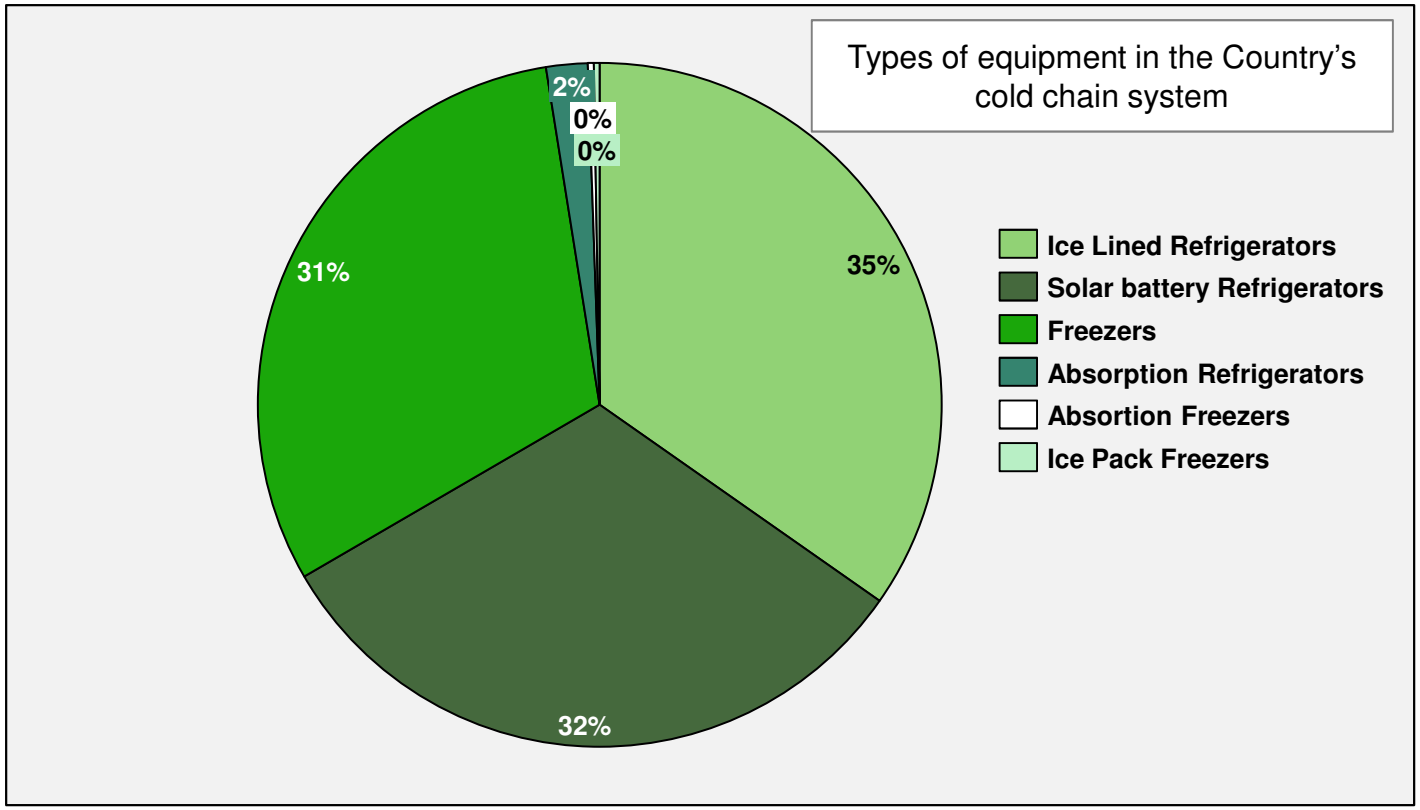
- Way forward for SDDs and other new technology in Nigeria

Prior to 2014, Nigeria's cold chain system was laden with *obsolete equipment technology

Pre-Procurement of Solar Direct Drive Equipment

The cold chain system particularly at the lower level largely comprised of solar battery powered equipment and **ice lined refrigerators

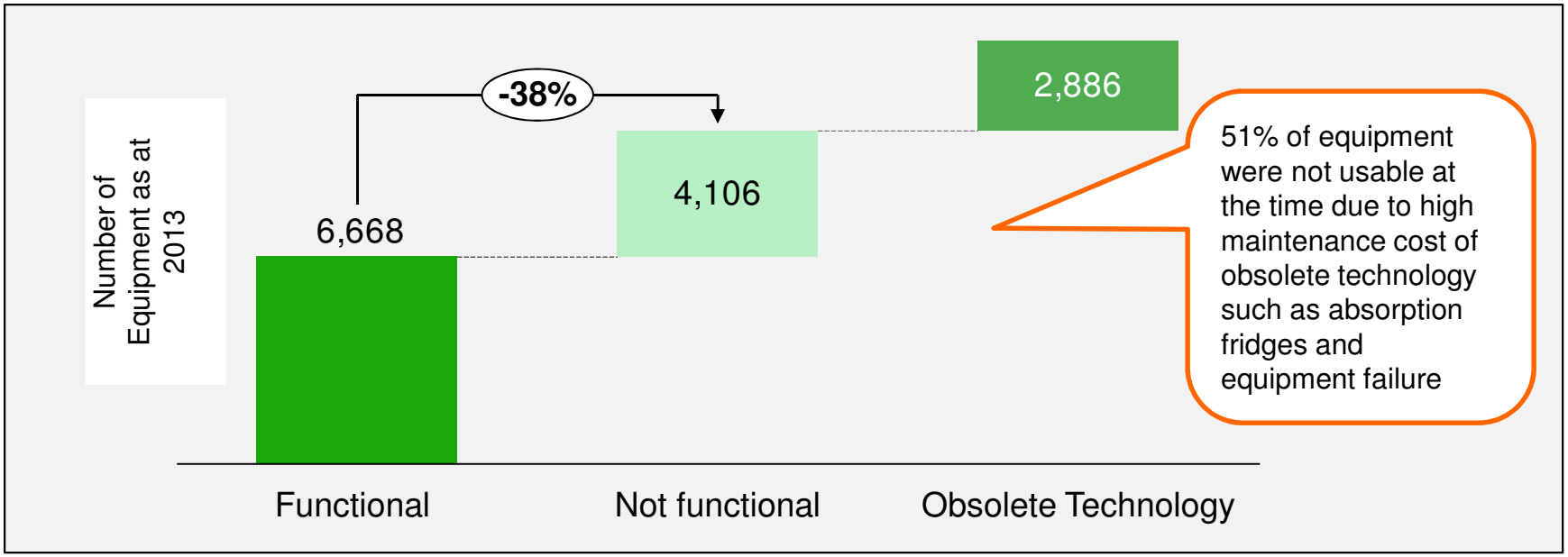


*Nigeria considers equipment > 10 years to be obsolete
** The absence of power supply to run ILRs were caused poor utilization of the equipment

The 2013 CCE inventory showed 30% of the equipment in the country were not functional

Before introduction of SDDs into the cold chain system in Nigeria there were:

- High numbers of equipment breakdown and extended down time periods (up to 12 months)
- Unavailability of spare parts – high cost of spare parts, excessive spare parts and repair costs (relating to solar batteries, charge controllers, voltage stabilizers)
- Lack of skilled technicians to provide curative maintenance



Nigeria has gradually transitioned the cold chain system from an ineffective system heavily saturated with older equipment technology to a more effective cold chain system

In 2013, the need to shift to more sustainable cold chain equipment was prioritized. Four key factors were considered in selecting what equipment would meet the needs of the population served.

1. High number of failures due high maintenance needs of equipment like absorption and solar battery.
2. Poor electricity power supply
3. Implementation of the NPHCDA policy of a minimum of 1 CCE per *ward
4. Health facilities to not only store vaccines for routine immunization, but also require conditioned ice packs for outreach and SIAs

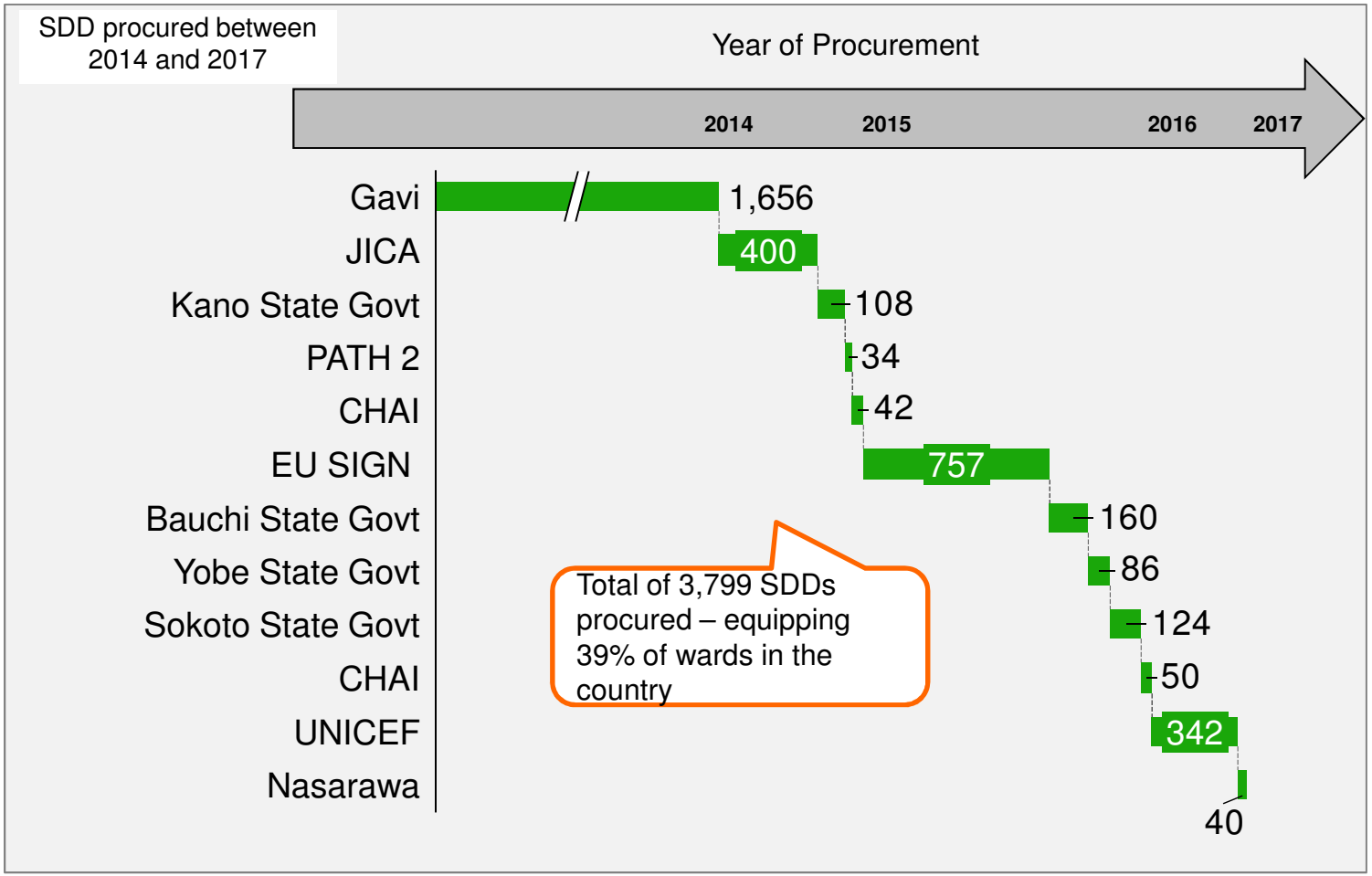
Decision: Dual Compartment Solar Direct Drives (SDD) refrigerators identified as most appropriate technology for use at the ward level

*Lowest political unit for policy implementation

Since 2013, 3,799 SDDs have been procured and deployed to the ward level

Post Procurement of Solar Direct Drive Equipment

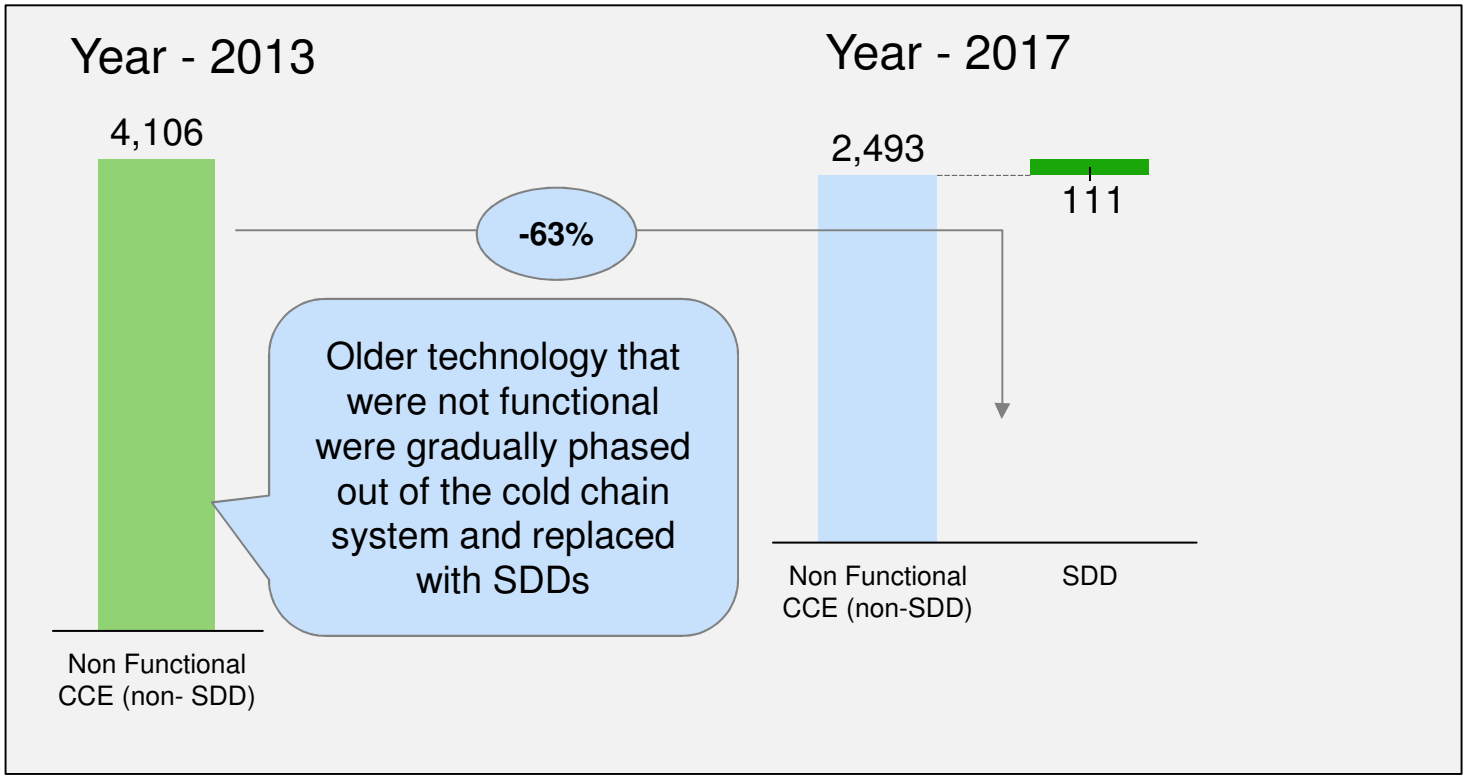
The Gavi funded SDDs proved appropriate in meeting the needs of the system, and paved the way for several other partner and state government SDD procurements between 2014 and 2017.



The 2017 Inventory shows only 4% of the Non Functional CCE at the lower level are SDDs

Post Procurement of Solar Direct Drive Equipment

The influx of SDDs into Nigeria's cold chain system shows that SDDs have lowest failure tendency* compared to older legacy CCEs such as Solar Battery or ILRs.

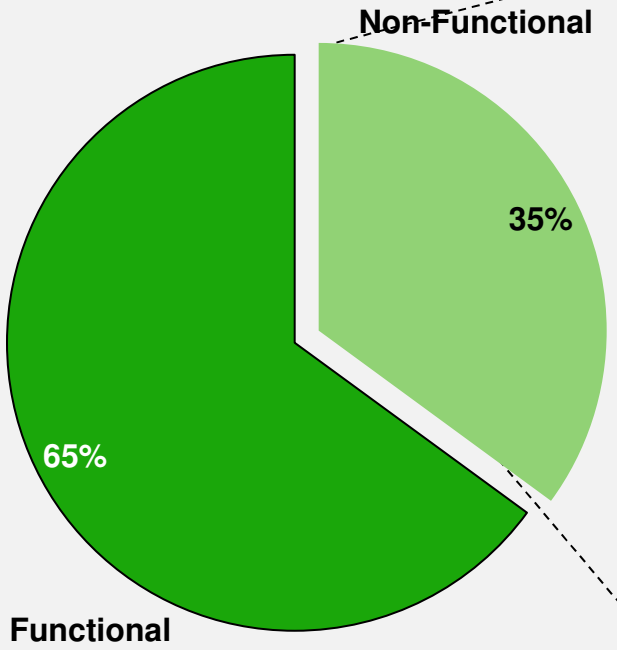


*Functionality rate is expected to remain low as equipment with newer technology (SDD) ages because there are less maintenance requirements for SDDs.

Faulty equipment are more predominant at *health facility level where PPM is not adhered to and a huge proportion of these are solar-battery powered CCEs

Ratio of Functional to Non-functional Refrigerators

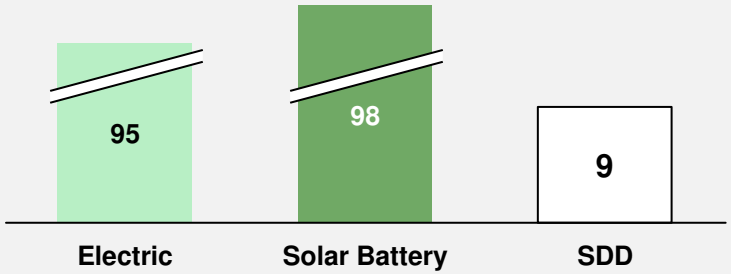
% Functional



** health facilities have more challenging PPM and curative maintenance access resulting the higher percentage

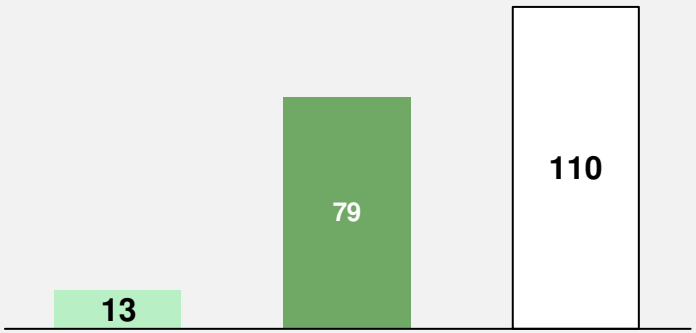
Category Non-functional CCE

Number of CCE



Location of 202 Non-functional cold chain equipment

Healthcare level



55%

All faulty and repairable CCEs are at service delivery level

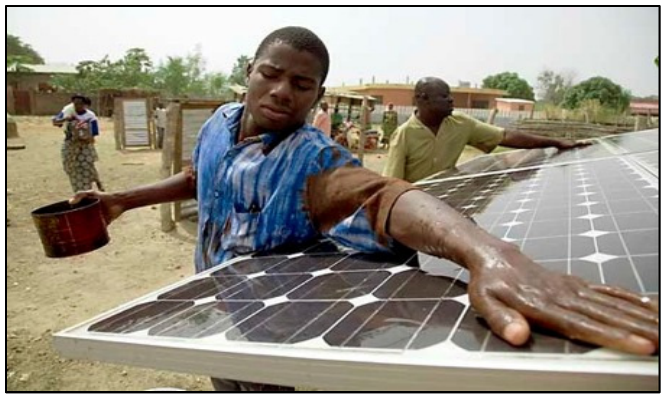
Solar Direct Drive CCEs have greatly improved the cold chain system in Nigeria

Introduction of newer technology such as SDDs into the cold chain system include

- Lower installation and operating costs – solar battery CCE rely on required frequent maintenance with a lifetime of ~3 to 5 years and replacements are expensive and often difficult to obtain
- Easy to conduct PPM due to fewer operating parts
- Maintains safer temperature with reduced dependence on users
- Reduced global green house emissions – gas and kerosene refrigerators contributes to local air pollution and an increase in global greenhouse gas emissions

Although there have been improvements in the cold chain system since the introduction of newer technology, challenges still exist

- Only one manufacturer offers 10 years of warranty protection, notwithstanding PPM corrective systems must exist and be owned by the government consequently- Funding of maintenance by states is either absent, or inconsistent.
- Expand training and retraining of front line health workers who use SDDs – NPHCDA with support from partners has deployed PPM guidelines, job aids etc, and various partners have embarked on HCW trainings
- There is a huge cold chain technician gap in the country and as newer technology are developed the knowledge gap is further increased



Nigeria is a large country with under 1 target population >7 million, consequently storage capacity gaps still exist at the ward and LGA level

- To fill the CCE gap in adherence with the national policy of one SDD per ward the CCEOP application plans for the gradual introduction of 7,634 SDDs and replacement of older technology between 2018 and 2022
- As Nigeria gradually transitions to fully equip the ward level with SDDs, significant investments will be required to upgrade the existing cold chain system to optimal cold chain equipment.
- The cold chain replacement and expansion plan will be tailored to phase out sub-optimal equipment; solar battery fridges, aged equipment, unrepairable equipment and expand capacity to new facilities.
- To ensure these investments are well maintained, state governments should explore the creation of response centers for CCE maintenance

Thank You

Questions/Comments