

Cold Chain solarization sustainable and eco-friendly innovation reaching zero-dose children living in remote areas in Venezuela



Authors: Dr. Melvin Moran, Dr. Marisol Escalona, Dr. Alex Garraud, Eng. Roberts Fajardo | mmoranquintanilla@unicef.org, mescalona@unicef.org, agarraud@unicef.org, rfajardo@unicef.org

Introduction

The Bolivarian Republic of Venezuela (commonly referred to as Venezuela) is on the northern coast of South America. It has a territorial extension of 916,445 km2 (353,841 sq. mi), and the World Bank estimated its population at 28.5 million in 2019. Venezuela has been facing a socio-political and economic situation that has negatively impacted its social, economic, and health indicators for years.

The population density in Venezuela varies considerably throughout its territory; the more remote and less accessible regions generally include the border states and indigenous population living in ecological reserves such as national parks, forest reserves, natural monuments, biosphere reserves, and other protected areas, some of them classified as "World Heritage Sites."

In the last ten years, Venezuela experienced regular power outages and blackouts. In 2019, the country presented an acute energy crisis that significantly impacted the vaccine cold chain, which worsened because of the COVID-19 pandemic. Under those circumstances, in coordination with the Ministry of Health, UNICEF Venezuela implemented a support program based on introducing solar technologies to strengthen the cold chain for vaccines in maternal and child care services.

The cold chain strengthening aimed to support the government's expanded immunization program by ensuring that the vaccines arrive in the most remote areas in perfect conditions to be applied to children and pregnant women. Besides installing 176 Solar Refrigerator-Freezers (DULAS VC60-SDD-1) nationwide, UNICEF trained the Ministry of Health staff on using and maintaining the equipment.

Methodology

- 1 Cold chain assessment and gaps definition.
- 2 Agreement with MoH for the introduction of equipment with new solar technologies (without battery).
- 3 Elaboration of Terms of Reference for the acquisition, distribution, installation, and capacity building in innovative technology for the adequate storage of vaccines in the 24 states of Venezuela.
- 4 Analysis to identify the health premises where the solar technology would be introduced. Specific criteria: located in the most vulnerable areas, with low vaccination coverage, difficult access, and no electricity.
- 5 Procurement of solar dual refrigerators (DULAS VC60-SDD-1) in coordination with the Supply Division of UNICEF in Copenhagen.
- 6 Development and execution of an operational deployment plan for the equipment's distribution, installation, training and rollout.
- 7 Hiring a local logistics service provider for land, air, and fluvial distribution to the most remote locations.
- 8 Development and execution of a daily communication plan and weekly meeting to coordinate between UNICEF-MoH and local service provider to ensure the successful distribution of 176 solar equipment
- 9 Contract with a local government-linked service provider for the installation of the equipment in 176 remote health facilities.
- 10 Elaboration and distribution of Standard Operational Procedure for the use and maintenance of the solar refrigerator.
- 11 To provide capacity building on-site to the MoH staff responsible for the use and maintenance of the solar equipment.
- 12 Monitoring activities to guarantee the proper installation and use of new solar innovative equipment.



Procurement



Logistic



Installation



Service delivery

Results

- 176 solar equipment installed
- 150,000 children reached with vaccines in remote areas
- 33 installation completed in high-risk areas
- 38 out of 44 indigenous communities reached at nation wide
- 200 health workers trained in the use of solar technologies

Indigenous communities reached

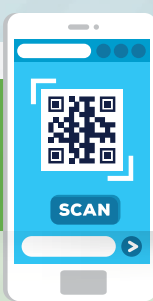
1. AKAWAYO	20. KURRIPACO
2. AÑU	21. MAKO
3. AREKUNA	22. MUCUMBU
4. AYAMAN	23. PEMON
5. BANIVA	24. PIAPOCO
6. BARE	25. PIAROA
7. BARI	26. PUINAVE
8. CHAIMA	27. PUME
9. CHIRIANA	28. SANEMA
10. CUIBA	29. SHIRIANA
11. CUMANAGOTO	30. WAIQUERI
12. EÑEPA	31. WARAO
13. GAYON	32. WAREKENA
14. HORCAZ	33. WAYUU
15. INGA	34. YABARANA
16. JIVI	35. YANOMAMI
17. KAMETSA	36. YEKUANA
18. KAQUETIO	37. YERAL
19. KARIÑA	38. YUKPA

Geo-reference of the 176 solar refrigerators installed in Venezuela

Conclusion

- UNICEF led the introduction of new solar technology in Venezuela, Solar Direct Drive (SDD) transmission equipment – without batteries, through the procurement and installation of dual refrigerators/ freezers DULAS equipment.
- The average life of these equipment is around 25-30 years, or even longer if good maintenance is provided. Due to its low maintenance cost and less need for electrical components, it is beneficial for electrical components and an excellent long-term investment.
- The installation and rollout of this 176-equipment made possible the re-opening of dysfunctional vaccination services in several remote health facilities, so this project represents one of the country office and government's relevant actions to reduce inequity and improve access to vaccination services access for unreached children" which lives in vulnerable communities and have zero immunization dose.
- Solar-powered equipment is installed without disturbing wildlife; an aspect especially significant in states with large biodiversity reserves such as Amazonas, Apure, Delta Amacuro, and Bolívar.

References



Video cold chain solarization in Venezuela



1

Case study Spanish version



2

Case study English version



3