SOLEIL – Keeping the Lights and Services On: Designing, Financing and Governing Maintenance for Public Facilities in Burundi

26th February 2026

Photo Credit: TTA Energy

ESMAP
Energy Sector Management Assistance Program

ELECTRIFYING AFRICA

MISSION 300
#PoweringAfrica

WORLD BANK GROUP

Photo Credit: TTA Energy

Context & Achievements

CHRISTOPHER PURCELL
Senior Energy Access Consultant,
Energy & Extractives, World Bank

Republic of Burundi

Geography: Burundi is a small land-locked country, surrounded by lake on one side, mountainous regions to north. Nearest port is Dar es Salaam 1,500km east.

Population: 14.7 million (2026)

- 15% urbanisation rate
- 85% rural – significantly populated rural areas, reliant on agriculture, prone to mass poverty and electricity deficiency.

Fragile, conflict and violence affected (FCV) country

- Exposed to 10 years of open conflict (1993-2003) , 3 years of economic embargo (1996-9), 4 year post-war emergency period (ending 2005).
- Ranks 187th out of 193 countries on Human Development Index (HDI 2025 Statistical Update).

Electrification status

- Grid electrification rate is only 11.6% (2023)
- Decentralised solutions serve a further 17-18%.
- Severe challenges with access to diesel and vehicle fuel.

Poor electricty access in Burindi hinders education, healthcare, investment and economic growth.

Political restructuring into 5 administrative zones (2025)

Sector facilities and target sites for solar electrification

Health Sector

	Total	Public	Private, faith based, NGO
Hospitals	106	53	53
- Referral Hospitals		11	53
- District Hospitals		42	
Primary Health Care Facilities	1,230	**670**	340

Target sites: Unelectrified public Primary health Care clinics (CDS) and communal hospitals

(~ 53% ->361 sites).

Education Sector

	Total	Public (state funded)	NGO (govt-aided)	Private
Tertiary	**50**	7	0	43
Secondary	**1,210**	1,125 All government supported		85
Primary Schools	**4,377**	~ 2,854 65% pupil share	~ 1,444 33% pupil share	~ 175 4% pupil share
- Central school		711	NA	NA
- Satellite school		2,134	NA	NA

Target sites: State-funded Central schools and their linked Satellite schools without electricity (~ 85% -> 2,418). And within locations supported by WB schools feeding project.

(346 sites, 102 Central, 246 Satellite schools)

Project Achievements and Pillars

708 Solar Sites,
361 health facilities,
347 schools by June 2026
$ 16.8 million

Remote Monitoring:
Technical and fleet management platforms.
100% of solar sites

Cross-Sectoral Engagement
with Bank colleagues and Development Partners to address sustainability.

Additional Financing
GIZ/EnDev support for digitalization, connectivity & remote monitoring
$ 1.3 million

Quality PV systems

High quality systems with design longevity. Modular and expandable systems. Introduction of Li-ion battery technology. Supporting 2 year O&M, 5 year component warranty. Local company participation and tendering success.

Alliance Soleil's Jean-Paul and Marie to elaborate further..

.

Remote monitoring innovation

Via *ESMAP support*, a trial unified Remote Monitoring platform for 150 systems on hardware neutral platform (Odyssey), for a standardised visualisation, and optimising fleet management.

For *ESMAP* – access to platform site data, enabling ESMAP to develop pilot dashboard for EaaS KPI's performance monitoring. *Deserving a separate BBL by ESMAP*.

.

Cross-sectoral collaboration

Energy-Health nexus; align health energy needs, O&M budgets. PBF financing mechanism. ***Digital-Health nexus*** align health's digitalisation needs, ATP for connectivity at facility level. *WB Health colleagues Sayed and Olivier.*

Cross-donor liaison: build on initiatives of ENABEL, UNICEF, EU, GIZ EnDev to support and strengthen O&M structures: *WB Energy colleague Stephanie*

Energy-Digital nexus: co-ordinate with WB digital colleagues, to devise plan for digital connectivity for all sites by September 2026. *WB Digital colleague Moctar.*

Require intermittent 2G for remote monitoring, but at least 3G for health digitalisation initiatives. Assess ATP for low orbit satellite for example.

100% PHC Health facilities now grid-connected, or PV solarised and pending 100% digital connectivity.

Solar PV with battery is a recognized priority service even for grid-connected hospitals and O_2 plant (300-600kWp scale). Rollout continues under WB, UNICEF, UNDP. Innovative business model opportunities.

Many primary schools remain for the future, following the SOLEIL pilot. Business model flexible.

Photo Credit: TTA Energy

SOLEIL's Maintenance Approach

STEPHANIE NSOM
Senior Energy Access Consultant,
Energy & Extractives, World Bank

“

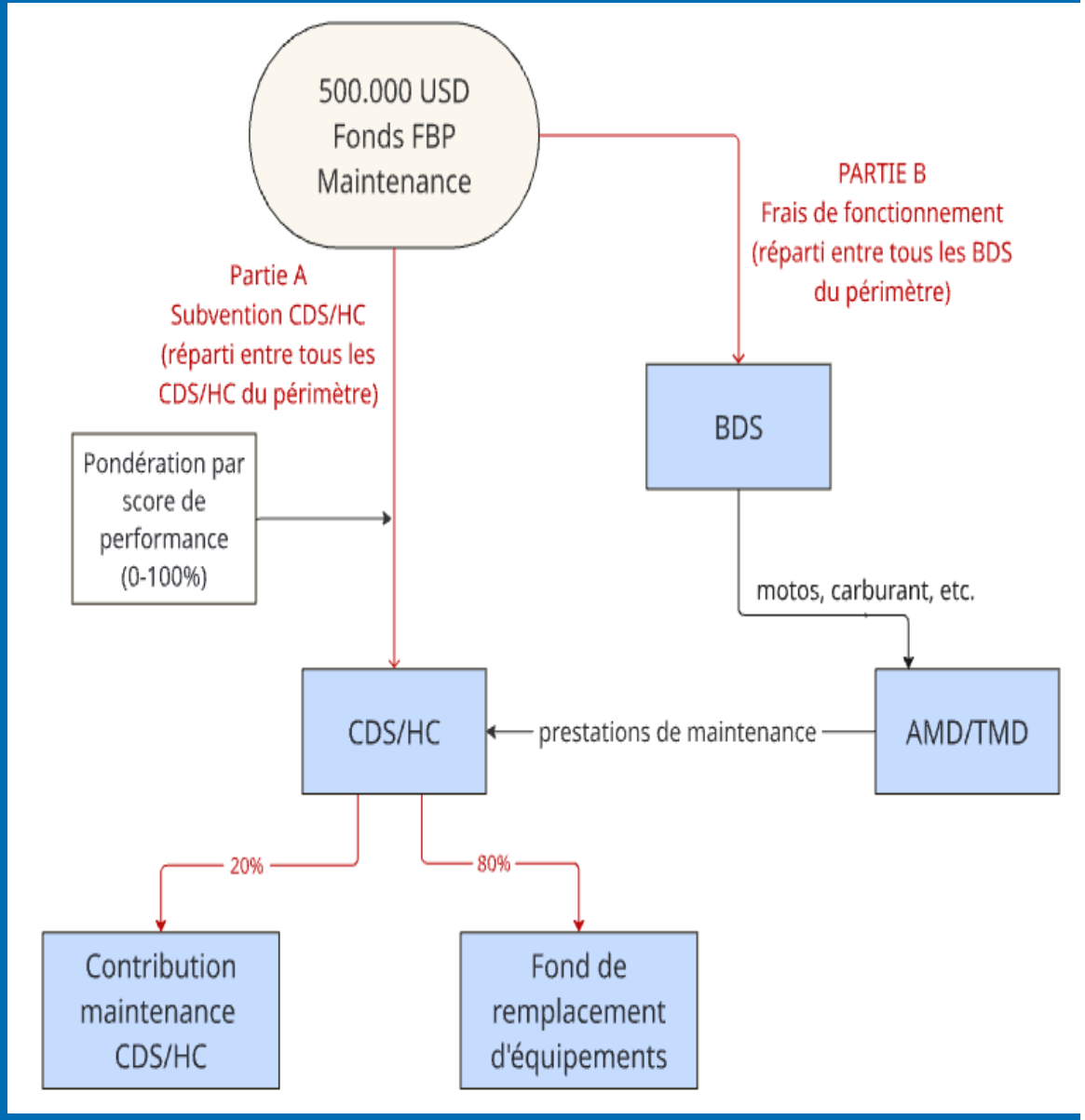
Before building architecture, we anchored maintenance in institutions, incentives and capacity.

Cross-Sector Collaboration

- Health & Education in Technical & Steering Committees
- Energy–Health & Energy–Education MOUs
- Alignment with biomedical maintenance

Technical Expertise to UCP

- Embedded procurement & technical advisors
- Maintenance manual & supervision framework
- O&M costing & replacement modeling



Maintenance Embedded in Health PBF

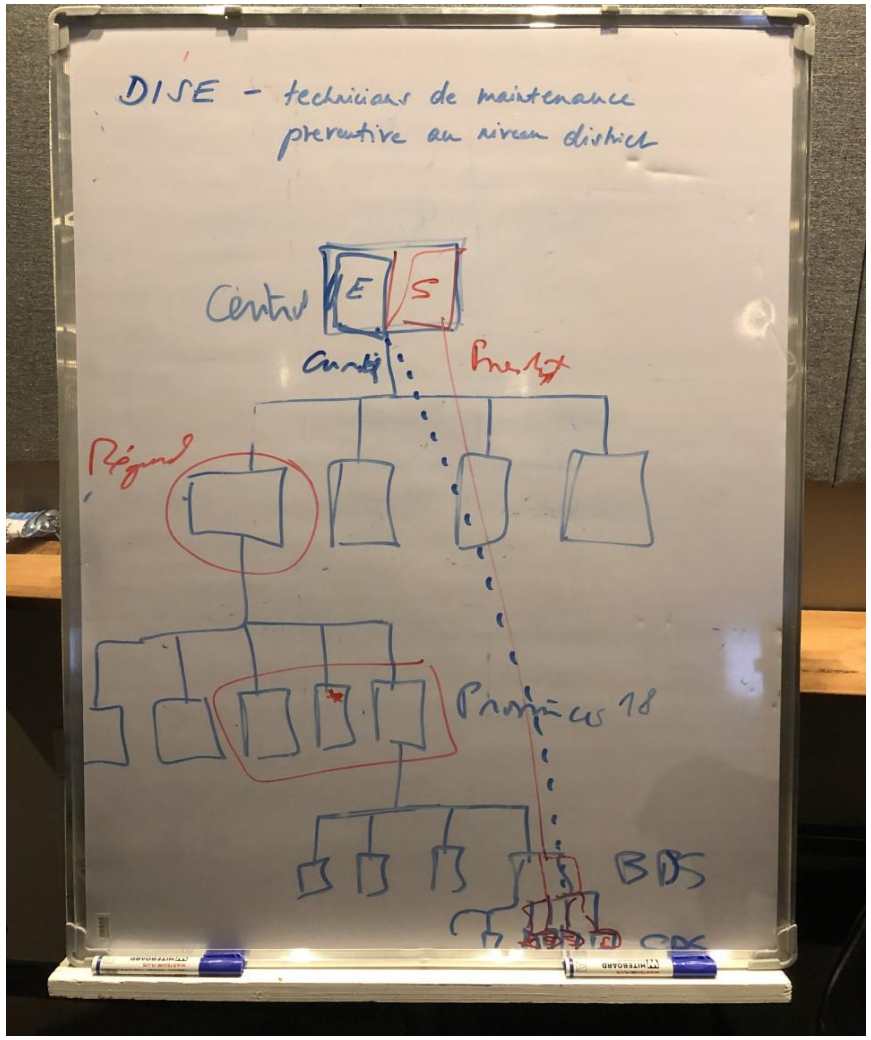
- Established national system (Gov ownership ~50%)
- Solar functionality indicator integrated
- 80% facility / 20% supervision
- Covers preventive & minor repairs
- Replacement fund for future expenses
- Verification structure

Preventive Layer (Decentralized)

- Provincial ateliers rehabilitated & equipped at national level
- Tools, spare kits, motorbikes, fuel
- 130+ technicians and engineers trained on solar PV + biomedical maintenance

Curative Backbone – National Maintenance Centre

- National coordination & supervision
- Remote monitoring oversight
- National spare parts & warranty holder
- Advanced engineering decisions
- Major component replacement & recommissioning



Standardized modular system design for scalable public facilities implementation :

Designing for today, upgrading over time

JEAN-PAUL LOUINEAU
Director: Alliance Soleil
Technical Advisor

Strategy and Technical design for **sustainability + adaptability**

Strategy	Results / achievements
Standardization / modular approach of the PV systems and electrical layout →	• **Standard building block** : systems were designed with same key power component regardless of the system size or destination (schools, health centers or communal hospitals) • Choice of Li-ion batteries • Systems ready for expansion and ready for connection to the national grid
Single tender for : supply + installation + 2 years maintenance + 5 years warranty + training users/tech →	• Two successful private companies have installation + maintenance skills, being transferred to the system owners/technicians • No need for site visits before the launch of DAO, but site visits during the inception phase.
Quality assurance mechanisms at all levels →	• Key components and warranties from reliable international manufacturers • Rigorous installation standards and commissioning procedures (150 check points + 50 pictures) • Remote energy monitoring of all systems • Systematic written exams after the training of the technicians and engineers
Data management (accessible to all : UCP, WB, private companies) →	• Implementation of shared folders for each sites : site plan, photos (pre/post installation), inspection reports, acceptance, maintenance reports, etc. • One Masterfile to collect all key information/data per site • Password protection / Modification is only possible for authorized personnel

Continual Building capacity : for all project actors (….up to end-users)

Procurement Strategy with additional technical assistance

Strategy

- Calculated Phased procurement
  - Phase A : 1 lot - Test the market
  - Phase B : 3 lots - Smaller lots to encourage local companies
  - Phase C : 3 lots
- Tender evaluation building capacity
  - Phase A – 2 weeks for on-site tender evaluation : Training in tender evaluation using practical case information
  - Phase B & Phase C : Remote support to UCP (visio, etc.)

Results / achievements

- Phase A : 12 offers (of which 4 were local) → 3 offers retained after tech and admin analysis → **0 Local offer selected**
- Phase B : 14 offers (of which 6 were local) → 3 offers retained after tech and admin analysis → **1 Local offer selected for 1 lot out of 3**
- Phase C : 12 offers (of which 5 were local) → 4 offers retained after tech and admin analysis → **1 local offer selected for 2 lots out of 3**
- Increasing local companies' involvement (sustainability ↗)
- 3 years between date of tender publication and end of systems installation :
  - First tender evaluation 4 months, reduced to 2 months for the last one
  - First Pilot acceptance 4 months, reduced to 1 month
  - Installation speed (from installation start to acceptance) from 9 and 14 sites per month upgraded to 35 and 40 sites per month.

Technical advice needed, provided at all stages and levels

TO TAKE ACTION is not relevant, TO BUILD THE CAPACITY TO TAKE ACTION is key

- Technical advice during tendering process for UCP management staff :
  - Tender documents evaluation development
  - Evaluation committee (mission in-country, then back-stopping)
- Building capacity at implementation level for UCP and private companies :
  - Sample and Pilot phase, Commissioning (development of technical procedures + on site testing of the procedures), testing grid readiness. All with private companies involved, including collaboration with the supervision firm
  - Ensuring quality training materials development
  - Training of trainers sessions (MSV, companies)
  - Data management
- Technical assistance always available with speedy responses and follow-up

© Alliance soleil

	Number of sites	Tender Publication	Opening of bids	Tender evaluation report	contract signings	Pilot installation	Bulk installation start	Bulk Installation acceptance
Phase A	151	Aug. 2022	Nov. 2022	March 2023	May 2023	Nov. 2023	Nov. 2024	Sept. 2025
Phase B – Lot 1 & 2	165	April 2023	June 2023	Sept. 2023	Nov. 2023	Aug. 2024	Sept. 2025	Feb. 2026
Phase B – Lot 3	45	April 2023	June 2023	Sept. 2023	Nov. 2023	Aug. 2024	April 2025	Sept. 2025
Phase C – Lot 1 & 3	246	June 2023	Sept. 2023	Nov. 2023	June 2024	March 2025	Dec. 2025	June 2026
Phase C – Lot 2	101	June 2023	Sept. 2023	Nov. 2023	June 2024	March 2025	Feb. 2026	Mai 2026

Embedding Maintenance into the Health PBF Mechanism: Incentives and Early Lessons;

and the Need for Digital Access to Modernise Health Services Management

SAYED GHULAM
Senior Health Specialist,
Health, Nutrition and Population
Global Practice, World Bank

Cross-sector Collaboration and the Role of Digital in Public Facilities Electrification

MOCTAR BEN KARIFJO MAHAMADOU,
Digital Specialist,
Digital AFE, World Bank

Thank you

Q&A to follow

ESMAP
Energy Sector Management Assistance Program

ELECTRIFYING AFRICA

MISSION 300
#PoweringAfrica

WORLD BANK GROUP