



Solar for Health (S4H) innovative financing feasibility study: Zimbabwe summary report

Table of contents:

- 1. Energy demand and financing need***
- 2. S4H coordination platform financing model***
- 3. S4H social, economic, and environmental impact***
- 4. UNDP role and implementation roadmap***

1. Energy demand and financing need

Many healthcare facilities in Zimbabwe lack access to electricity entirely or struggle with its limited reliability, and off-grid solutions have yet to scale

The Government of Zimbabwe (GoZ) is targeting 85% nationwide electrification by 2020. Even pre-COVID-19, achieving this ambitious goal would have been unlikely: nationally, energy access rates barely reach 40%, with rural energy access remaining below 20%.

National development plans in Zimbabwe currently rely heavily on leveraging cheap fossil fuel assets as core to improving national electrification. Indeed, the country's significant coal reserves (an estimated 553m tonnes, of which 65% are quite shallow) make coal a very cost-effective (though arguably unsustainable) energy source. A Chinese-led consortium, for example, recently invested US\$3b into building the 2.1 GWp Sengwa coal power plant, making it the biggest power plant in the country once completed (i.e., more than double the size of the current largest power plant, the 920 MWp Hwange Thermal Power Station). These on-grid coal power plant investments, however, are still likely to remain insufficient for achieving universal energy access.

Encouragingly, GoZ also promotes renewable energy (RE) strategies despite the relative importance and abundance of cheap coal. The National Renewable Energy Policy (NREP), for example, aims to reduce greenhouse gas emissions by 33% through 2030. And the country is also set to achieve its target of 1 GWp installed RE generation capacity by 2025: RE already comprises 44% of its current 2 GWp installed capacity (most notably, the 750 MWp-capacity Kariba Dam Hydroelectric Power Station). Additionally, favourable policies including net metering and feed-in-tariffs for smaller users support the RE market demand; developing a framework for feed-in-tariffs for large-scale independent power producers (IPPs) could further support sector development. For rural populations, the Ministry of Energy and Power Development (MOEPD) has similarly prepared a Rural Electrification Master Plan (REMP) to electrify long-neglected rural areas, with solar PV technologies considered as the least-cost option to meet projected demand.

Given economic challenges, these national strategies depend significantly on donor support to develop infrastructure, including for example: the US\$44m grant-funded Zimbabwe Reconstruction Fund (ZIMREF); the US\$145m Zimbabwe Multi-Donor Trust Fund (ZimFund) with grants from the governments of Australia, Denmark, Germany, Norway, Switzerland, Sweden and the United Kingdom). But endemic corruption, including budgetary leakage on donor funds flowing through government accounts, led to a period of debilitating economic sanctions and an embargo on foreign capital inflows. The sanctions being gradually lifted, the country is renewing attempts to attract public and private sector capital to jumpstart its infrastructure development, including improving its on- and off-grid energy infrastructure. However, these efforts (including foreign exchange and monetary reforms) have thus far failed to restore investor confidence in Zimbabwe's economy.

In the healthcare sector, specifically, achieving universal and reliable energy access remains an ever-present challenge. According to the Ministry of Health and Child Care (MoHCC), most of Zimbabwe's 1,184 public healthcare facilities are connected to the grid. Even for these 'electrified' healthcare facilities, however, electricity access remains unreliable and effectively non-existent due to frequent load shedding (occurring up to 18 hours per day). Most on- and off-grid healthcare facilities still depend solely on costly and high-polluting diesel generators.

UNDP's Solar for Health (S4H) programme aims to address these issues and bring reliable and clean energy to healthcare facilities across Zimbabwe. By strengthening access to reliable solar energy, the S4H programme can significantly impact the quality of public healthcare, particularly for the most disadvantaged and remote populations, whilst also supporting local green growth and climate action. Specifically, S4H directly contributes to the following social, economic, and environmental Sustainable Development Goal (SDG) outcomes in Zimbabwe:

- Social: SDG3 (Good Health and Well-being); SDG10 (Reduced Inequalities);
- Economic: SDG8 (Decent Work and Economic Growth); SDG9 (Industry, Innovation, and Infrastructure); and
- Environmental: SDG7 (Affordable and Clean Energy); SDG13 (Climate Action).

As part of the S4H programme's pilot, 403 public healthcare facilities have been equipped with solar PV systems. The country's experience in the programme's implementation, as well as feedback provided by these facilities will represent an important learning point in the programme's scale up in Zimbabwe.

An estimated US\$24m in financing is urgently needed to provide reliable solar energy access to healthcare facilities

An estimated US\$24m in investment capital is needed in Zimbabwe to finance the capital expenditures required to provide energy access to healthcare facilities, over an initial 7-year investment timeline.

The investment sizing assumes the following:

- Healthcare facilities within scope: on-grid facilities with diesel generators as backup and off-grid facilities without energy access. Facilities with existing off-grid solar solutions were excluded, though a further assessment should be conducted by MoHCC during programme implementation to determine if additional capacity may be needed for these facilities. Finally, small health posts were assumed to be out of scope for solar PV systems, given their small size and limited range of healthcare services. For these facilities, solar lanterns may be relevant and sufficient, though these are not included within the S4H programme;
- Energy needs, O&M, and autonomy assessment: an average energy needs and O&M assessment is assumed for different categories of healthcare facilities (from rural clinics to large hospitals) based on regional usage benchmarks. The exact needs assessment of each target facility will need to be conducted by MoHCC in collaboration with a local ESP to determine exact solar PV system sizing and investment need. Additionally, autonomy (i.e., through lithium batteries) is estimated at a one day for on-grid facilities and two days for off-grid facilities. Incorporating a hybrid solution with a diesel generator as a back-up solution, where financially relevant, can reduce total investment need;
- Diesel versus off-grid solar for energy needs: although the estimated levelised cost of energy (LCOE) of solar PV systems (US\$0.66/kWh) is greater than that of diesel generation (US\$0.55/kWh) over the initial contract period, the investment sizing assumes the social and environmental benefits from providing off-grid solar energy to all public healthcare facilities within scope outweigh this unit cost difference. Furthermore, this conservative costing analysis: (i) is based on benchmark retail prices for diesel in urban centres and does not factor in transportation and other middlemen costs that may increase transaction costs to rural healthcare facilities, (ii) does not incorporate CAPEX costs for generators (as it is assumed many healthcare facilities may already have the relevant systems; this, however, is often not the case), and (iii) estimates unit cost based on 7-years of operation (given minimal marginal operations cost, unit costs should decline further as solar PV systems are used past this initial investment timeline and as replacement battery costs decline). Finally, diesel value chains may also experience other unreliability/unavailability supply issues that can generally hinder reliable energy access. Consequently, this can make any costing analysis an unfair comparison

as off-grid solar costs are typically greater given the inherent systems needed to ensure continuous and reliable energy access; and

- **Investment timeline:** an initial 7-year timeline covering initial capital expenditures and long-term O&M. A properly maintained solar panel can last up to 25-30 years, a lithium-ion battery lifetime ranges between 5-15 years. Investment financing is structured on an 7-year timeline, though this may be extended if investors show a preference/appetite for longer investment horizons (i.e., in which case, a new battery might have to be purchased prior to a new financing cycle).

	Clinics and polyclinics	Rural health centres	District, rural, mission & other hospitals	Central & provincial hospitals	TOTAL
Initial investment outlay (unit)	US\$37.7k	US\$36.1k	US\$67.9k	US\$206.3k	
Annual O&M cost (unit)	US\$1,510	US\$1,732	US\$2,320	US\$5,125	
Number of facilities	274	465	20	13	772
Total hardware cost	US\$7.94m	US\$12.59m	US\$1.04m	US\$2.08m	US\$23.65m
Total turnkey cost	US\$10.32m	US\$16.78m	US\$1.36m	US\$2.68m	US\$31.14m

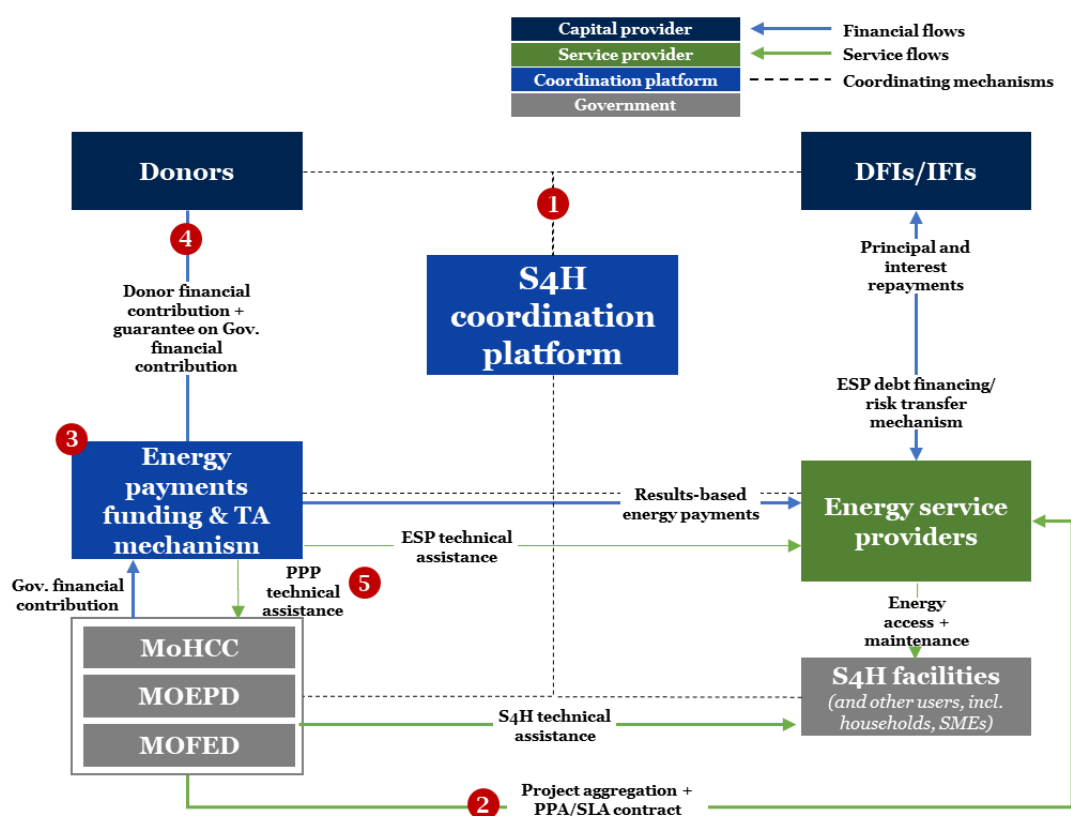
Unlocking the quantum of investment capital needed to scale-up the S4H programme remains challenging given inherent financing and operational challenges in Zimbabwe

- **Low MoHCC ability-to-pay:** high levels of public debt (83% of GDP in 2017; up from 70% in 2016) and budgetary mismanagement have resulted in decreasing allocations for healthcare spending. Additionally, past cases of budgetary leakage from government accounts (in 2016, Transparency International estimated that Zimbabwe is losing at least US\$1b annually to corruption) have reduced donor appetite in providing direct financial support to MoHCC. Indeed, part of capital expenditures in the health sector is paid for by international donors through ZimFund, independently from GoZ. Consequently, low MoHCC ability-to-pay and creditworthiness creates high payment default and public counterparty risk for potential S4H investors;
- **Lack of access to local financing to develop local markets:** traditional commercial off-grid energy investors have expressed little appetite for undertaking public counterparty risk in Sub-Saharan Africa, including Zimbabwe. This has significantly limited access to affordable capital for local energy service providers (ESPs) that may focus on public infrastructure, including healthcare facilities. Where local financing may be available, it can come at prohibitively onerous terms (typically only offering rates >20%). After an extended period of problems with inflation (the peak occurred in November 2008 with inflation hitting c.98% per day), followed by a period with a multiple currency system (i.e., with several international currencies, including US\$, working as a de-facto official currencies), GoZ introduced the Zimbabwean RTGS dollar as a sole official currency. While this new currency aims to stabilise the economic situation, its ambition has yet to yield results. Zimbabwe is therefore still considered a particularly high macroeconomic risk country, discouraging most private investors from investing there;
- **Poor incentives for long-term operational and environmental sustainability:** existing grant-financing models fail to incentivise long-term sustainability. Due to donor programmatic timelines (typically 3-5 years), specific priority mandates and funding processes, and shorter-term impact metrics, many donor-funded projects prioritise disbursing funding upfront to cover initial capital expenditures (CAPEX) versus financing longer-term annual commitments. This often results in premature failure of solar PV systems within the first few years and reduces potential for impact. Importantly, from a donor perspective, this CAPEX-only financing represents low value-for-money: it can often be the case that a revolving set of donors will finance new off-grid solar initiatives for the same healthcare facility every few years; and
- **Lack of coordination and technical capacity to support project development:** short-term donor mandates and preference for direct financing of technical assistance and/or discrete projects can often create ad-hoc and short-term focused initiatives that fail to deliver long-term impact.

This lack of coordination between different government ministries, donor agencies, and project implementers (in this case, often large international players with limited local presence) prevents effective implementation of national off-grid energy strategies and increases transaction costs related to project procurement, aggregation, due diligence, and delivery.

2. Solar for Health coordination platform financing model

A holistic approach bringing together stakeholder coordination, long-term de-risked financing, and technical assistance can be instrumental in scaling the S4H programme



1. A S4H coordination platform will support MoHCC with procurement and tendering to aggregate projects that can attract development finance institution (DFI) financing

The S4H coordination platform will coordinate a partnership between MoHCC, the Ministry of Finance and Economic Development (MOFED), MOEPD, Zimbabwe Rural Electrification Agency (REA), Zimbabwe Energy Regulatory Authority (ZERA), local representatives, commercial investors, and local ESPs. UNDP, through its facilitation role, will supervise and support the entire investment process from procurement through to investment monitoring to ensure proper quality standards and successful implementation of the programme.

- PPP procurement and tendering to support project development:

- *Coordination with MOFED:* in the absence of a dedicated PPP law, PPP projects are implemented under the concessions law by MOFED in Zimbabwe. MOFED, closely assisted by ZERA, is in charge of assessment of PPP project feasibility and value-for-money. So far, energy PPP initiatives have predominantly targeted on-grid generation, though there are opportunities for MoHCC and other S4H coordination platform stakeholders to leverage PPPC's and MOFED's experience with PPPs and adapt relevant best practices for procurement and tendering;
- *Coordination with MOEPD and REA:* the S4H coordination platform will coordinate with MOEPD, REA, and MoHCC to ensure alignment between NREP, existing and

planned power investments, and priority healthcare facilities that may overlap with other ministries' development plans. Additionally, MoHCC can leverage MOEPD's expertise and technical knowledge, and ZERA's experience with private power investments, IPP contract negotiations, and energy project management;

- *Coordination with local representatives*: project selection, energy needs assessment, project preparation, and community engagement will be conducted in close collaboration with community leaders and MoHCC national and province representatives to ensure buy-in, adapt projects to local context and needs, and allocate budgets to the programme;
- **Project aggregation to create investable portfolios**: although investment in S4H and the public sector is a non-starter for most commercial investors, DFIs have explicit development mandates (often coupled with an appetite for public sector exposure) and large balance sheets for investment in larger-scale infrastructure and energy projects. The investment needs of an individual healthcare facility, however, cannot meet the minimum investment ticket sizes for DFIs (>US\$10-100m versus typical individual healthcare facility investment needs of US\$45-230k). By aggregating a portfolio of projects through a S4H coordination platform, the S4H programme can create larger investment ticket sizes of sufficient relevance for DFI capital.

There are few examples of other financing initiatives that have similarly leveraged DFI capital (in the form of concessional loans, equity, or grants) for the renewable energy sector in Zimbabwe. For example, the European Union provided a grant of €7.3m to enhance the socioeconomic well-being of rural populations through the Sustainable Energy for Rural Communities (SE4RC) programme; DFID's Africa Clean Energy (ACE) Business Programme promotes a market-based approach to private-sector delivery of solar home systems.

- **Mobilisation of private capital to finance local ESPs**: the S4H coordination platform will also be responsible for coordinating the financing and investment due diligence processes with different GoZ stakeholders, DFIs, and local ESPs. Specifically, the S4H coordination platform will develop investment due diligence criteria as part of its support to MoHCC during the procurement and tendering process to local ESPs, as well as explicitly coordinating with different DFIs and incorporating respective investor considerations. DFIs may still run separate investment due diligence processes as part of their own organisational processes in parallel to the S4H coordination platform. But already incorporating their investment considerations as part of the PPP procurement can (i) help streamline the investment process for both DFIs and local ESPs and (ii) ensure linkages between the tendering process and investor capital mobilisation. For example, by making S4H tenders contingent on a satisfactory DFI investor due diligence of the project bid and of the local ESP, the S4H coordination platform ensures that winning bidders necessarily also receive access to affordable financing.

2. A power purchase agreement (PPA) and leasing mechanism will align financial incentives and smooth payments over time to ensure long-term financial, operational, and environmental sustainability

A PPP/PPA and leasing mechanism will set out the contractual and financial obligations between DFIs, MoHCC, and the local ESP over the 7-year contract lifetime to ensure long-term sustainability:

- **Financial sustainability and local market development**:
 - *Investor returns matching respective risk-return appetites*: the financing capital structure is expected to blend senior debt at USD-denominated market returns (i.e., DFI capital) with concessional climate finance funds and/or donor grant capital. This blended finance approach will match interest rate returns to the respective risk-return appetites of different capital providers, whilst ensuring that access to financing remains affordable for local ESPs (versus current local financing rates >20%). The interest rate returns will depend on the expectations of committed capital providers identified during financial structuring negotiations, as well as the degree of blending between commercial and concessional financing;
 - *MoHCC and donor affordability/value-for-money*: as the contracted off-taker for energy access to public healthcare facilities, MoHCC will be liable for payment obligations under the PPP. Currently, high upfront CAPEX can be prohibitively expensive and reduce the number of healthcare facilities that can be targeted. By

spreading the total energy access costs across a series of smaller leasing payments, MoHCC and/or donor funders can reduce their monthly costs and improve affordability. Additionally, financial incentives for long-term operational sustainability will support increased impact and value-for-money. Donor mandates focused only on upfront CAPEX funding, however, will need to be adapted to support these recurring payments. Zimbabwe's existing donor-funded ZimFund may potentially be leveraged for these objectives;

- *Local ESP market development*: monthly leasing payments will be paid to the local ESP by a coordinated energy payments funding mechanism comprised of donors and MoHCC over the 7-year contract duration. These leasing payments will be priced to include capital expenditure, long-term O&M, cost of capital, and local ESP commercial margins to support local market development. Additionally, access to affordable blended financing through the S4H coordination platform will enable solar PV asset ownership to remain with the local ESP throughout the PPP contract duration (before ownership transfer to MoHCC). By bearing this financing risk, the local ESP will also benefit from earnings on leasing financing margins. This can support the financial sustainability of local ESPs, as well as strengthen their track record and ability to access capital markets in the future;

- Operational and environmental sustainability:

- *Long-term local ESP operational performance obligations*: under the current grant-based model, donors typically only finance the upfront cost of solar PV panels and initial installation. Long-term O&M (and proper disposal) is often not priced into contracts. Although MOEPD and REA have the necessary expertise to provide training on and manage solar PV systems, their capacity to cover all the healthcare facilities in the scope remains insufficient, thus leaving these obligations with the ESP.

Under the S4H coordination platform model, the local ESP (in collaboration with MoHCC) will conduct an energy load needs assessment across its project portfolio and provide appropriately-sized solar PV systems and installation services. The local ESP will then be responsible for long-term O&M and will need to ensure solar PV system availability and achievement of minimum-service level operational performance criteria, as defined under an SLA. Additionally, given the potential geographic spread of project portfolios, local ESPs may need to train healthcare staff or community-based technicians for more frequent and basic maintenance (e.g., cleaning panels).

The PPP/PPA will specifically aim to incentivise long-term operational sustainability by pricing in O&M into the contract over its 7-year term. Monthly leasing payments will be conditional on achieving the SLA operational performance standards to provide financial incentives for high-quality service over the full life of the PPP/PPA contract. In the event solar PV systems fail to meet minimum service-level performance standards required by the healthcare facility, for example, payments to the local ESP may be reduced and/or withheld. As the S4H coordination platform envisions an initial 7-year investment timeline, the PPP/PPA contract will need to be extended with a new long-term O&M contract (including coverage of any replacement parts) after this investment horizon to maintain on-going sustainability after the 7 years; and

- *Local ESP environmental sustainability and disposal obligations*: the PPP contract might additionally price in disposal costs as part of the local ESP's long-term sustainability obligations. From a technical perspective of disposal, however, there are no standardised best-in-practice guidelines and little practical experience with disposal and recycling of components from medium- to large-scale solar energy systems. There are no hazardous materials in silicon PV panels and lithium batteries (as opposed to lead acid batteries) that should present an environmental concern. The details of where and how it should be disposed (as well as the existence and/or capabilities of relevant ecosystem players), however, need to be further developed. Encouragingly, recycling PV panels and battery components can have economic value and is of relatively low complexity. The market for local recycling value chain actors is expected to grow as these technologies further develop.

3. An energy payment funding mechanism will coordinate healthcare energy contributions from donors and MoHCC to support ability-to-pay on payment obligations under the PPP

The energy payments funding mechanism will coordinate financial contributions from international donor agencies and local public institutions (i.e., MoHCC), including incorporating existing budgetary allocations for healthcare energy spending. Zimbabwe's existing donor-funded ZimFund may potentially be leveraged to contribute to the energy payments. These monthly energy payments will remunerate the local ESPs as part of the PPP/PPA contractual frameworks and are fundamental to mitigating MoHCC payment default risk (in order to attract DFI investor capital):

- Support for MoHCC ability-to-pay through coordinated donor funding: donor contributions within the energy payments funding mechanism will cover a pre-defined proportion of the monthly leasing payments to local ESPs. MoHCC will be contractually obligated to finance the remaining balance, with covenants in place in the event of default. These can include removing defaulting healthcare facilities from the S4H programme and/or reduced future donor funding to MoH as penalties.

Currently, MoHCC and its subdivisions manage budgets of public healthcare facilities, either paying their expenses directly (such as staff salaries or utility bills) or providing the facilities in-kind (such as medicines and diesel for generators). Theoretically, MoHCC could reallocate these existing sources of energy financing to cover its financial obligations under the PPP/PPA contracts. As budgetary allocations, however, often do not cover full energy access (i.e., amount of diesel received is often not sufficient; and in some instances, no diesel is provided due to GoZ budget shortfall), potential budget reallocations from switching to off-grid solar solutions may not be sufficient to cover monthly leasing payments of full energy access. This existing funding amount is nonetheless not negligible: US\$26m, or 68% of the total funding need in Zimbabwe.

The proportion of donor funding versus MoHCC contributions to the leasing payments will thus need to be negotiated amongst relevant stakeholders during structuring of the PPP to ensure ability-to-pay. Donor commitments are an essential component needed to balance MoHCC's low ability-to-pay and should be sufficient in size to reduce payment default risk (and attract investor financing). This coordinated funding mechanism, however, can still face a funding shortfall: as donor programmatic mandates are typically shorter-term (i.e., 3-5 years), many donor agencies are unable to commit to the full 7-year investment horizon and can only conditionally commit to funding in later years if programmatic mandates are renewed. This risk can be partially addressed by (i) putting MoHCC contributions into escrow during the first years of a secured donor mandate and using only donor capital during this period for PPP payments (if applicable), with MoHCC funding from escrow released in later years and/or (ii) using guarantee mechanisms (though these can be costly) and donor first-loss capital. Alternatively, certain donor funding windows, such as the Green Climate Fund, may be able to provide funding commitments up to 7 years;

- Potential additional revenue streams to minimise MoHCC liabilities: MoHCC, with implementation support from local ESPs, TA providers, and UNDP can explore additional revenue streams to help off-set payment obligations, including selling excess energy generation to local communities, feeding it into the grid or net metering (though the current feed-in-tariff policies for small users need to be further promoted), and/or carbon credits in global carbon markets. For example, the S4H programme can reduce carbon emissions by an estimated 11.5k tCO_{2e} per annum (assuming full off-grid solar energy access for target facilities versus current energy mix of diesel and grid power by facility type). Under Article 6 of the Paris Agreement, there may be potential for these internationally transferred mitigation outcomes (ITMO) carbon credits to be sold in global carbon markets: at benchmark prices of US\$10-\$15 per tCO_{2e}, MoHCC can potentially reduce its payment obligations by up to US\$115-172k per annum. Although these additional revenue streams will likely remain small and unable to cover full payment obligations, they are nonetheless welcome upsides to help offset MoHCC liabilities;
- Partial foreign exchange risk mitigation: as international donor contributions are typically denominated in hard currencies (e.g., USD, EUR), such funding will partially mitigate foreign exchange risk (up until the proportion of its share of the energy payments) on financing liabilities (i.e., repayments to investors) that are also denominated in hard currencies;

- Reduced budgetary leakage: building upon the donors' past learnings in Zimbabwe, donor contributions through UNDP will minimise risk of leakage into GoZ's general budgetary allocations and spending outside of the S4H programme. Ensuring a direct link between financial contributions and repayment to investors will additionally reduce investor perception of public counterparty risk; and
- MoHCC buy-in and long-term asset ownership: although MoHCC's partial financial contributions to the leasing payments will expose investors to a measured level of public counterparty risk, it is also important to ensure MoHCC has financial obligations as part of the PPP financing. This skin-in-the-game will incentivise MoHCC's commitment to the long-term sustainability of the solar PV systems (versus often-limited buy-in under the current grant-based funding model).

4. Guarantees will be necessary to backstop MoHCC contributions to the leasing payments and further mitigate GoZ public counterparty risk for DFI capital

Despite donor contributions to the leasing payments through the energy payments funding mechanism, a complementary set of contingent grants/guarantees may still be required to de-risk investor capital against MoHCC public counterparty exposure and short-term donor commitments. Specifically:

- MoHCC public counterparty risk: guarantees and/or donor first-loss capital to backstop energy payment obligations can mitigate partial exposure to MoHCC defaults on its payment obligation under the PPP and provide credit enhancements to investors. As guarantee mechanisms can be costly and the donor contributions do not fully mitigate investor risk, a structured combination of both financial tools may be more effective at attracting DFI capital. These guarantees can be structured to either backstop payments to the ESP or directly on payment obligations to investors. The specific terms and payment coverage will depend on the cost and availability of guarantee mechanisms and donor capital; and
- Short-term donor commitments: guarantees can play an additional role at temporarily backstopping donor commitments to energy leasing payments in later years of the PPA. This risk that a potential donor may fail to renew its commitment in later years may need to be covered by a partial guarantee to attract longer-term investor capital.

5. Technical assistance and capacity-building will support GoZ's regulatory and PPP framework development and strengthen procurement, project development, investment due diligence, and project delivery and monitoring capabilities

MoHCC, given its limited expertise with PPP and energy procurement tenders, will require technical assistance (TA) and capacity-building from procurement through project management. Additionally, a nascent local off-grid ecosystem will depend on international/regional partnerships and S4H coordination platform support to strengthen local market capabilities. Specifically, a TA provider financed by donor grant capital through the coordinated TA funding mechanism (managed by the same executing entity for the energy payments funding mechanism) can support MoHCC and local ESPs with the following:

- Project preparation support: healthcare facility selection and prioritisation, specific energy needs assessment, scope of work definition, and investment sizing across hundreds of potential facilities will need to be completed in an initial phase of S4H implementation;
- Procurement and tendering process: although MoHCC can leverage on the initial learnings from the S4H programme (i.e., 403 healthcare facilities equipped with solar PV installations during the programme's pilot), additional TA is still essential to adapt best practices to scaling S4H (i.e., tendering aggregated portfolios of healthcare facilities in large procurement contracts);
- Contract and project management: TA can additionally be provided to support PPP contractual and term sheet negotiations with DFIs and local ESPs, PPP governance, and portfolio management; and
- Local ESP project delivery capabilities: the local market ecosystem is slowly growing in Zimbabwe (currently c.20 locally-licensed solar companies), but it still remains nascent. Larger local players (such as Tatanga Energy, Samansco or Cool Solar) primarily focus on urban markets for solar home systems. Otherwise, most local ESPs are small enterprises that are not

of sufficient size and/or technical capability to bid for large public procurement tenders. Consequently, large international actors (such as Canadian Solar or Vitron Energy) continue to play an important role in Zimbabwe’s energy initiatives. TA financing will encourage development of the local market by supporting business plan development, contract procurement, and technical project delivery capabilities (including the upskilling of local and community-based O&M technicians). A large regional player or international joint venture may be relevant in an initial phase to bring in necessary technical expertise.

3. S4H social, economic, and environmental impact

Scaling up the S4H programme in Zimbabwe is expected to deliver better healthcare quality, strengthen local economic green growth, and support climate action

1. Improved energy access and healthcare quality (especially for patients in rural areas)

- Improved healthcare quality for patients across 772 facilities: S4H is estimated to provide access to reliable energy to 772 healthcare facilities with a total catchment population of up to 9.5m individuals. This improved availability and strengthened resilience of healthcare facilities are expected to significantly improve health outcomes across the board, from quantitative indicators (e.g., earlier diagnosis and better treatment of malaria, better response to local outbreaks of infectious diseases such as Covid-19) to softer qualitative indicators (e.g., improved patient comfort); and
- Reduced inequalities in health services: lack of access to reliable energy disproportionately affects rural healthcare facilities located in areas where the poorest populations live. Bringing reliable energy access to rural areas can reduce the healthcare quality gap between rural and urban communities in terms of healthcare quality.

2. Economic green growth and job creation

- Local economic development through green growth: S4H can catalyse foreign direct investment inflows (an estimated US\$24m for this programme alone), develop the local energy ecosystem, and create green jobs (particularly in rural communities);
- Renewable energy sector capacity-building: technical assistance and capacity-building of government ministries and local ESPs will contribute to further market transformation and national implementation of off-grid solar technologies; and
- Creation of new value chains: the recycling and disposal of solar PV systems can create demand for new value chains and develop new local green enterprises.

3. Cleaner energy and environmental benefit

Moving from providing full energy access to public healthcare facilities through off-grid solar (versus equivalent diesel usage) will reduce carbon emissions by approximately 11.5 ktCO₂e per annum:

	Total	Clinics and polyclinics	Rural health centres	Other hospitals	Hospitals
Diesel efficiency	20%	15%	20%	25%	30%
Diesel MWh	5,176	1,250	3,395	175	356
Grid MWh	5,884	1,250	3,395	409	830
tCO ₂ /year	11,517	3,127	6,986	484	920

4. UNDP role and implementation roadmap

UNDP can play three key roles to support implementation of the S4H coordination platform in Zimbabwe

- Create a convening platform for stakeholder coordination and buy-in: given its networks and track record in Sub-Saharan Africa, UNDP is uniquely-positioned to play a convening role through the S4H coordination platform with all relevant public (i.e., MOFED, MOEPD, MoHCC, community leaders, donors) and private (i.e., DFIs, local ESPs) stakeholders; ensure stakeholder buy-in and alignment of respective mandates and incentives with S4H objectives; and provide oversight of roles and responsibilities for successful collaboration;
- Support capacity-building and strengthening of regulatory frameworks:
 - *Off-grid/renewable energy regulatory frameworks*: while some large-scale energy initiatives exist in Zimbabwe, these have predominantly targeted on-grid generation (such as solar power plants in Munyati, Insukamini and Gwanda). UNDP can support MOEPD and REA in strengthening their off-grid development strategies and incorporating clearer targets and timelines into NREP and MOEPD's other national electrification initiatives. As part of these development strategies, UNDP can further strengthen incentives and favourable policies for the renewable energy sector based on global best practices (including, for example, implementation and wider promotion of feed-in tariffs and net metering for smaller grid-connected users). And through off-grid initiatives like S4H, UNDP can support GoZ in developing new off-grid/distributed energy models that could be scaled up under the relevant national master plans;
 - *PPP regulatory framework and management*: UNDP can support MoHCC to leverage expertise from MOFED and develop a dedicated PPP regulatory framework, incorporating global best practices, such as creation of an independent PPP unit. By supporting capacity-building of this unit/MOFED to include healthcare off-grid energy infrastructure, UNDP can strengthen MoHCC's PPP and contractual frameworks, increase private sector investor appetite through budgetary allocation ringfencing, and reduce transaction costs on PPP procurement and management;
 - *Local ESP capabilities*: although the local ESP ecosystem is growing steadily in Zimbabwe, it still remains underdeveloped and will require support to reduce dependence on large international off-grid solar actors. Through UNDP-supported TA providers, UNDP can encourage development of the local market and its project procurement and delivery capabilities (including the upskilling of local and community-based O&M technicians outside major urban areas); and
- Align and mobilise donor and investor capital to S4H objectives: UNDP can leverage its partnership development and fundraising platforms to mobilise global development capital providers (i.e., donors, DFIs, climate funds, guarantees providers) to provide grant, guarantees, and investor capital for the S4H innovative financing facility.

Additionally, UNDP may also play a key role in coordinating with international donor agencies to align existing and future off-grid energy programmatic initiatives with S4H objectives (including coordinating the energy leasing payments and TA grants and/or incorporating flexibility into short-term funding timelines and mandates). In Zimbabwe, the existing donor-funded ZimFund may potentially be leveraged for the energy payments. For this, UNDP would need to play a coordinating role with the governments of Australia, Denmark, Germany, Norway, Switzerland, Sweden and the United Kingdom to redefine respective mandates for contributions into the fund, if appetite for participation exists.

Finally, UNDP can support global alignment around the development of ITMO carbon markets under Article 6 of the Paris Agreement, to mobilise climate finance as a potential additional revenue stream for S4H healthcare facilities.

Initial feedback from a consultative workshop with GoZ stakeholders indicate interest in further developing the S4H programme

The representatives of GoZ have confirmed their interest in pursuing discussions to investigate how the next stage of S4H could be implemented in Zimbabwe based on the proposed mechanism. As next steps, the participants to the workshop are seeking a more detailed ecosystem analysis that will identify the key stakeholders and further define their roles and responsibilities for the implementation phase.

It was emphasised that the programme should work hand in hand with relevant public bodies and build upon their previously launched initiatives. Notably, a wider cross-sectorial discussion and coordination

will be needed to explore a potential for electrification of surrounding public and private facilities, through their connection to the S4H facilities, therefore achieving improved energy access and substantial economies of scale.

Furthermore, the participants underlined the need to consider the policy aspect when structuring the S4H programme. While the current policy on net metering and feed-in tariffs targets mostly retail customers, its extension beyond smaller users could substantially benefit the S4H programme business case, as well as contribute to the promotion of the policy among wider public.

UNDP has identified the Green Climate Fund (GCF) as a potential donor to support the leasing payments and Zimbabwe is well placed to benefit from GCF support for S4H programme given the GCF primary focus on least developed countries and Africa. UNDP has been working on a concept note for the GCF that shall be validated by the GoZ to launch the programme implementation.

UNDP will be organising a set of follow-up calls with relevant ministries to continue engagement and align on next steps.

Based on these learnings, the following are recommended next steps and an implementation roadmap

- Draft and execute a Letter of Interest for the Green Climate Fund (GCF): as a concrete outcome of the country consultative workshop, UNDP is to coordinate with relevant government ministries to execute a Letter of Interest supporting a proposal request for funding from the GCF and its Project Preparation Facility (PPF);
- Develop memorandums of understanding between GoZ and UNDP: UNDP will formalise partnership with relevant GoZ stakeholders (including MoHCC, MOEPD, MOFED) setting out guiding principles for engagement on S4H innovative financing programme;
- Define S4H programme scope: MoHCC will conduct a comprehensive energy needs assessment, project selection and prioritisation, and budget sizing across its portfolio of healthcare facilities, in collaboration with UNDP and MOEPD;
- Engage with donors, DFIs, and other capital providers: UNDP, relevant GoZ stakeholders, and its financial transaction advisor will engage with donors and investors to mobilise early interest and/or commitments for the S4H programme; and
- Design and structure the S4H coordination platform financing model: based on the initial design of the PPP model in this feasibility study and MoHCC’s operational design requirements, UNDP and its financial transaction advisor will develop a financial model and investment term sheet to fundraise with donors, DFIs, and other investors. The full design and launch of an S4H innovative financing facility in Zimbabwe is expected to take 1-1.5 years.

