

The background of the entire page is a photograph of a telecommunication tower. The tower is a lattice structure with several antennas and equipment boxes mounted on it. A worker wearing a yellow hard hat and a red safety vest is visible at the bottom right, working on the tower. The sky is a mix of blue and grey, suggesting an overcast day. The overall tone is dark and industrial.

Green Power for Mobile

ENERGY OUTSOURCING: SUNLABOB MYANMAR

NOVEMBER 2014



Green Power for Mobile

In partnership with the Netherlands

Case Study Background

As a country, Myanmar has an electrification rate below 30%¹, and this has created a roadblock for mobile network operators (MNOs) to expand their network into rural areas. Green Power for Mobile (GPM) has estimated the power requirement for base stations currently stands at about 200 GWh in 2015 and is expected to climb to 455 GWh in 2017².

It means MNOs need to find an alternative way to power up their sites. A green power technology can provide an alternative solution for MNOs to overcome this situation and at the same time reduce a dependency upon fossil energy. But investing in green power will require a huge capital outlay for MNOs and special maintenance treatment for the system.

Energy service companies (ESCOs) offer their services to an MNO/TowerCo that is willing to pay them on a monthly or per kilowatt-hour (kWh) basis as a return based on a green power technology. ESCOs will invest in equipment and maintain the system to ensure an agreed service level agreement (SLA) is met. It can be a good option for MNOs to outsource a power solution.

In this case study, GPM has developed a local company in Myanmar to be a future ESCO for the telecom industry.

About Sunlabob³

Established in 2001, Sunlabob Renewable Energy is a Laos-based company specialising in renewable energy and clean water solutions throughout the developing world. An expert in rural, remote areas, Sunlabob offers a wide range of products and services that achieve one common goal: to enable long-term access to clean energy and water.

The company has expanded far beyond its initial focus in Laos, and is now providing its integrated expertise of rural electrification to governments, multilateral development agencies, multinational companies, NGOs and private individuals throughout Southeast Asia, India, Africa and the Pacific.

Now in partnership with Relitec, Sunlabob has established Sunlabob Myanmar. Focusing on the solar green technology option, Sunlabob Myanmar plans to provide a cost-effective, reliable off-grid power solution for telecom sector in Myanmar.

¹ MOEP – www.moep.gov.mm

² GPM Research

³ Sunlabob – www.sunlabob.com

Case Study

The partnership between GPM and Sunlabob was based on desktop research activities, with the following objectives:

- Knowledge sharing on cellular technologies and mobile operator structures
- Knowledge sharing about green power and its implementation in the telecom sector
- A green technology design using HOMER software
- Analysis of business opportunities for Sunlabob as an ESCO
- Best practice sharing on operational and maintenance related topics

The study was divided into two parts; the first one was remote support and the second one was on-site support. During the remote support phase, GPM explored and provided Sunlabob a roadmap on how MNOs disseminate and adopt green technologies into their networks – from early stage until the latest development on GSM network.

On-site support was conducted in Myanmar that covered a green technology discussion and design. At the same time, GPM and Sunlabob have developed business models for both CAPEX and OPEX.

Current Operational Scope

GPM identified the current asset ownership and operational scope from the Myanmar market. Figure 1, below, shows the matrix of asset ownership and operation scope between MNO, TowerCo, managed service provider (MSP) and third party.

Figure 1: Asset ownership and operational scope

		MNO	TowerCo	MSP	3 rd Party
Asset Ownership	Telecom Equipment	Own			
	Tower and Site Infrastructure	Own/Lease	Own		
	Power Equipment	Own/Lease	Own		
	Other Passive Equipment	Own/Lease	Own		
Maintenance	Telecom Equipment			Maintain	Maintain
	Tower and Site Infrastructure		Maintain		Maintain
	Power Equipment		Maintain	Maintain	Maintain
	Other Passive Equipment		Maintain	Maintain	Maintain
Infrastructure Operation	Site Monitoring	Responsible	Responsible	Responsible	
	Diesel Re-fueling		Responsible		Responsible
	Electricity Payment	Responsible	Responsible		Responsible
	Site Security		Responsible	Responsible	Responsible

On asset ownership, MNOs own their telecom equipment whilst TowerCos own passive infrastructure. Regarding the active and passive equipment maintenance, MNOs have shifted their responsibilities to a TowerCo, MSP or third party, including day-to-day site operations such as site monitoring, site security, diesel refuelling and site monitoring.

Methodology and Approach

The methodology was based on desk research and knowledge sharing between GPM and Sunlabob. The study focused on the future roadmap for Sunlabob, as illustrated below:

Figure 2: Future roadmap



Step 1 – ESCO for telecom tower: this step will be a short-term strategy for Sunlabob for the next 1-2 years. In the short-term, Sunlabob will focus on developing an energy outsourcing business model based on a green technology solution and offer it to the MNO/TowerCo.

Step 2 – ESCO and community power: in a long-term strategy, community power can be a good option for Sunlabob to consider, while, at the same time, providing the power to MNO/TowerCo as Sunlabob’s anchor tenant.

The approach of the study is shown in Figure 3.

Figure 3: Approach



Market Data Validation

On market validation, Sunlabob shared data on the power system market price from its previous project in the country. The data was used in this study during the design and modelling of a green power solution for technical analysis and business case development.

Green Power Technology Assessment

GPM and Sunlabob identified a model for green power adoption in the telecom sector based on current stage of deployment and the country’s geography. Below is an assessment of the stage of adoption of different renewable energy sources:

Table 1: Green technology assessment in Myanmar’s telecom sector⁴

	Solar	Wind	Biomass	Fuel cell	Micro-hydro
Resource potential	★★★★	★	★★★★	★★★	★
Technology availability	★★★★	★★★	★★★	★★★	★
Market acceptance and commercial viability	★★★★	★	★	★	★
Supply chain readiness	★★★★	★	★★★★	★	★
Stage of adoption	Commercial	Evaluation	Evaluation	Evaluation	Evaluation

Note: ★ : Low
 ★★ : Medium
 ★★★ : High

Based on the data seen in the assessment table above, the current deployment of solar technology is the most adequate green power solution for the telecom market. The other green technology options such as wind, biomass, fuel cell or micro hydro require further study and trial.

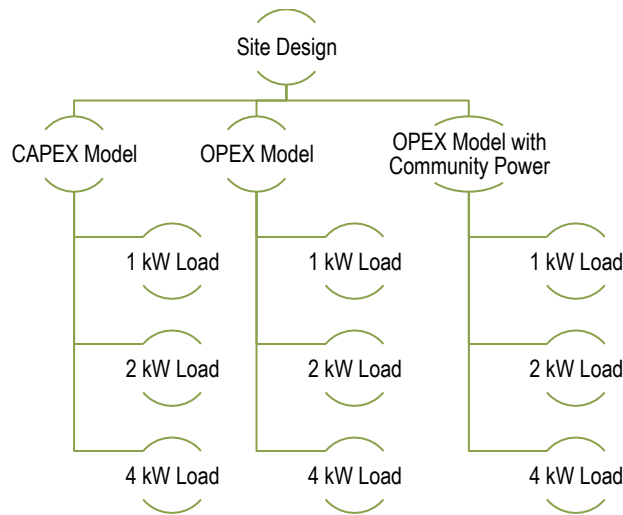
GPM and Sunlabob focused on solar technology for the design and modelling of a telecom tower power supply.

Technical Analysis

In technical design, GPM directed its work, based on the initial objective on Sunlabob’s strategy roadmap. GPM and Sunlabob developed designs for 1kW, 2kW and 4kW load for each of the models, seen in Figure 4 – CAPEX, OPEX and OPEX plus Community Power.,

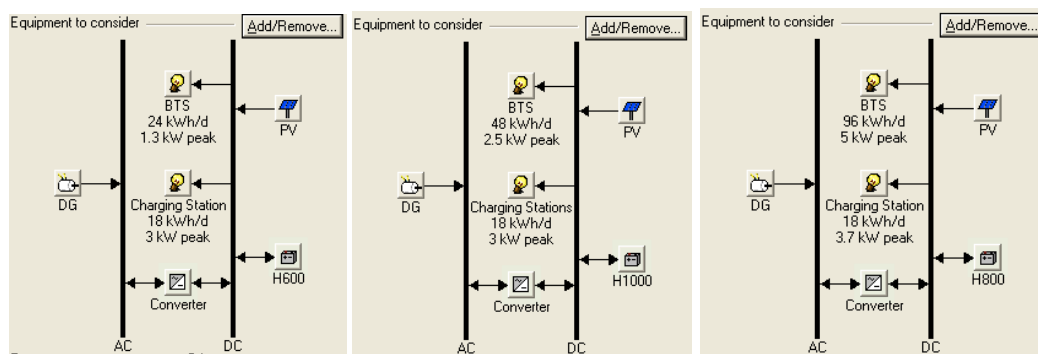
Figure 4: Site modelling

⁴ GPM Research



The load models above were based on Sunlabob's inputs and experiences in Myanmar with an incumbent MNO. On site designing, GPM used HOMER software to create a simulation for each business model with a different load capacity.

Figure 5: Site design – OPEX model with community power



Business Case Development

Once technical modelling and design were completed, GPM and Sunlabob focused on business case development, GPM shared two business models:

1. CAPEX model: in this model, Sunlabob will offer and sell its solution to MNOs/TowerCos with warranty support after the installation.
2. OPEX model or outsourcing model: Sunlabob will take responsibility for purchasing and maintaining the equipment for MNOs/TowerCos and, in return, Sunlabob will receive a regular fee. There are three kinds of OPEX model that have been implemented in the telecom market.
 - a. The monthly flat fee model; this implies that the ESCO will install a green solution and provide power to the site. The MNO/TowerCo will pay a monthly fixed price to the ESCO.
 - b. The power purchase agreement (PPA) model is an outsourcing model in which the MNO/TowerCo needs to pay on a usage basis.

- c. The energy saving agreement (ESA) model will require more effort to implement, as the MNO/TowerCo and ESCO partner need to record the current OPEX consumption in each particular site before implementing a green solution.

In this study, GPM and Sunlabob have agreed to develop a monthly flat fee model for green power, instead of using the PPA or ESA models because a PPA or ESA model will not be easy to adopt in the early stage of network implementation where there is a lot of network coverage expansion for a green field deployment.

Operation and Maintenance Concept

The study also has explored operation and maintenance (O&M) aspects for energy outsourcing. Basically, the maintenance concept exhibits no differences in each industry and always consists of the following processes seen in Figure 6, below.

Figure 6: Operation and maintenance processes



- Monitoring is the most critical point in O&M, because it is important to keep an eye on all network statuses to ensure equipment provides power 24/7.
- Maintenance is a first line activity that includes on-the-ground staffing for preventive maintenance, corrective maintenance or predictive maintenance with all equipment on site.
- Managing performance: a maintenance contract always comes with specific key performance indicator (KPI) and service level agreement (SLA) targets. Managing alerts is a way to keep KPIs and SLAs from any degradation.
- Audit is a part of the control process, and aims to find any weakness or leakage in daily operations. The outcome from the audit is to provide suggestions as to how to reach operational excellence.
- Improvement becomes the most important thing in moving toward operational excellence targets in overall O&M activities. By carrying out continuous improvement activities, ESCOs will be able to secure a payback period for each particular site through O&M processes.

Conclusion

The study has reached the following conclusions:

Short-term strategy

- Sunlabob needs to prepare a team to deliver an ESCO model
- Sunlabob has to find a good qualified engineer for operation and maintenance
- Establish a good procurement system for green power equipment
- Prepare a trail for 3-5 sites with MNOs/TowerCos based on OPEX model

Long-term strategy

- Prepare a solid business case for a tower and community power model
- Engage with a strong investor to scale up the deployment
- Identify a region for the first trial of a community-based power project

About GSMA

GSMA represents the interests of mobile operators worldwide. Spanning more than 220 countries, GSMA unites nearly 800 of the world's mobile operators with 250 companies in the broader mobile ecosystem, including handset and device makers, software companies, equipment providers and Internet companies, as well as organisations in industry sectors such as financial services, healthcare, media, transport and utilities. GSMA also produces industry-leading events such as Mobile World Congress and Mobile Asia Expo.

For more information, please visit the GSMA corporate website at www.gsma.com. Follow GSMA on Twitter: @GSMA.

About Mobile for Development – Serving the underserved through mobile

Mobile for Development brings together our mobile operator members, the wider mobile industry and the development community to drive commercial mobile services for underserved people in emerging markets. We identify opportunities for social and economic impact and stimulate the development of scalable, life-enhancing mobile services.

For more information, please visit the Mobile for Development website at <http://www.gsma.com/mobilefordevelopment/>. Connect with us on Twitter @GSMAM4D

About the GSMA Green Power for Mobile Programme

Green Power for Mobile works to extend the coverage, reduce the cost and minimise the environmental impact of mobile networks by championing renewable energy.

Whilst it continues to serve mobile network operators globally, the programme will place key focus on a number of target markets in Africa and Asia including Indonesia, Bangladesh, Pakistan, Afghanistan, Nigeria, Ghana, Kenya, Tanzania, Uganda, Senegal and Cameroon. With Project Managers based in each of these regions, GPM is well-positioned to engage with the industry and address the requirements of these markets.

For more information on the GSMA's Green Power for Mobile Programme, please contact us on greenpower@gsma.com

<http://www.gsma.com/mobilefordevelopment/programmes/green-power-for-mobile>